APPENDIX D

TRANSPORTATION AND TRAFFIC

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APPENDIX D

PART I – Transportation System Impact Analysis Methodology

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D.1 OVERVIEW

This appendix summarizes the methodology used to assess transportation system impacts for EIS Proposed Action, which is to implement the Fort Belvoir Real Property Master Plan update. It also includes summaries of transportation projects in the study area that were relevant to this process. This information is also provided in Chapter 5 of the RPMP Fort Belvoir Transportation Management Plan (TMP) (US Army, 2014c). The results of the analysis are reported in Section 3.4 of this EIS as well as in Chapter 5 of the TMP.

The goal of the transportation analysis was to assess the transportation system impacts of future growth at Fort Belvoir that would result from implementing the RPMP in the short term (2013-2017) and the long term (2017-2030). The transportation analysis was done for several purposes:

- As part of the master planning process, to identify locations on Fort Belvoir where short-term and long-term transportation improvements are required to maintain acceptable levels of service.
- For the travel demand management (TDM) component of the RPMP TMP, to measure the effects of reducing single occupancy vehicle (SOV) trips during peak hours as a result of TDM actions.
- For the EIS process, to identify impacts on transportation facilities that would result from implementing the EIS alternatives in order to aid agency decision making on the Proposed Action and alternatives.

The transportation system impact analysis employed two different but overlapping analysis methods:

- For the short-term (2017) traffic analysis, traffic count data from 76 traffic survey locations were analyzed using the Synchro 8 Traffic Signal Timing Analysis Software (Synchro 8) program for the intersections and Highway Capacity Manual (HCM) software for roadway merge/diverge/weave areas. These programs simulated existing conditions and analyzed traffic operations by calculating a series of parameters that describe the operational characteristics by vehicle delay and level of service (LOS). There are six LOS classifications, "A" (representing the best conditions) through "F" (representing the worst conditions). The result was 2013 No-Build delay and LOS data for the 76 sites. The Synchro and HCM programs then were used to estimate 2017 intersection and ramp/diverge/merge delays and LOS for the 76 sites. The regional model results were used to determine traffic background growth factors and other adjustments to the programs.
- The National Capital Transportation Planning Board (TPB) regional travel demand forecasting model Version 2.3.39 was used to project the long-term (2030) transportation system impacts of implementing new projects on Fort Belvoir and to provide 2017 (short-term) traffic volume estimates to guide the 2017 short-term traffic analysis. The regional travel demand model includes future programmed transportation improvements, and Metropolitan Washington Council of Government (MWCOG) estimates of future land use patterns, population, and employment. This was especially important for the Fort Belvoir area, where a major new road is being built (Mulligan Road), and other major improvements (the widening of US Route 1 with inclusion of dedicated transit right-of-way) are underway, which will influence future traffic patterns.

  The long-term traffic conditions in the study area were evaluated in terms of estimated volume-to-capacity (V/C) ratios for the AM and PM peak hours in 2030, under the No-Build and Build Alternatives. Because of the uncertainty associated with these forecasts of 2030 conditions, three categories of V/C ratios were used: Under Capacity, (LOS range A-D), Near Capacity (LOS E), and Over Capacity (LOS F).

Estimates were developed for 2017 and 2030 for the No-Build condtion (the EIS No Action Alternative) and for EIS Alternatives 1, 2, and 3:

- No-Build Conditions - This scenario reflects the roadway network improvements under construction and those in advanced stages of plan development, and the continued construction of new buildings outside of Fort Belvoir. Within Fort Belvoir, the existing 140 DoD tenants,

representing the bulk of Fort Belvoir's workforce and defined largely of professional/administrative uses, the housing areas and community uses that serve the Soldiers, Families, and the workforce, will all remain in place.

- Alternative 1 – Full Implementation – the Preferred Alternative. Full Implementation of the proposed short-range projects would increase the installation employment from roughly 39,000 in 2012 by approximately 5,000 to 44,000 by 2017, while the proposed long-range projects would add approximately 12,000, bringing the total 2030 workforce to 56,000.
- Alternative 2 – Modified Long Range Plan. The proposed projects would increase the installation employment by approximately 4,000 to 43,000 by 2017 and by approximately 7,000 to 50,000 by 2030.
- Alternative 3 – Modified Short Range Plan. The proposed projects would increase the installation employment by approximately 1,200 to 40,000 by 2017 and by approximately 14,000 to 55,000 by 2030.

The following sections provide details on the transportation system impact analysis process.

D.2 RELEVANT STUDIES

The existing transportation system in the Fort Belvoir area has been evaluated in many previous studies. These studies have investigated the existing and proposed transit network, roadway improvements, and the effect of new developments on the transit and roadway networks. The following studies have been summarized, including the relevance of each to the transportation impact analysis process:

- 2013 Virginia Department of Rail and Public Transportation Route 1 Multimodal Alternatives Analysis (VDRPT, 2014)
- 2012 US Route 1 Countywide Transit Network Study (FCDOT, 2013)
- 2012 US Route 1 Widening Study and Environmental Assessment (EA) and Appendix: Final Transportation Technical Report (USDOT, FHWA, 2012)
- 2012 Environmental Assessment for the Expansion of U.S. Army Intelligence and Security Command Headquarters Facilities (US Army, 2012f)
- 2011 Environmental Assessment I-95 HOT Lanes Project (VDOT, 2011)
- 2010 Fort Belvoir Comprehensive Traffic Engineering Study (US Army, 2010o)
- 2010 Commissary/Post Exchange Traffic Impact Study (Civiltech, 2010)
- 2010 Fairfax County Parkway Traffic Technical Report (FCDOT, 2010)
- 2009 Museum Interchange Analysis - Subsequent Study at Fairfax County Parkway and Kingman Road (Gorove/Slade, 2009)
- 2008 Museum Corridor Study (Gorove/Slade, 2008)
- 2008 National Geospatial-Intelligence Agency Traffic Analysis (Belvoir New Vision Planners, 2008)
- 2008 Proposed Highway Improvements, I-95 Defense Access Roads Ramps to the Engineering Proving Ground [FBNA], Fort Belvoir, Virginia, EA (USDOT, FHWA, 2008)
- 2007 Final Environmental Impact Statement for Implementation of 2005 BRAC, Fort Belvoir (US Army, 2007a)

- 2006 Richmond Highway-Telegraph Road Connector (Mulligan Road) Fairfax County Environmental Assessment (USDOT, FHWA, 2006)

These studies analyzed various areas in the Fort Belvoir area at different times and proposed improvements associated with the subject facility. Many of the proposed improvements are either currently under construction or in the planning stage, and various recommendations are scheduled to be implemented in the near future.

2013 Virginia Department of Rail and Public Transportation Route 1 Multimodal Alternatives Analysis (VDRPT, 2013 ongoing – References in EIS Volume 1, Chapter 7)

The Virginia Department of Rail and Public Transportation is conducting an alternatives analysis focused on a 14-mile portion of US Route 1 from the I-395/I-495 Beltway through Fairfax County to State Route 123 in Woodbridge, Prince William County. Transportation modal alternatives include bus rapid transit, light rail transit, extended Metrobus service, bicycles, and pedestrian travel. The study includes a land use analysis to develop the transit alternatives and an economic impact analysis to estimate the return on investment as it relates to increases in the tax base, jobs, and housing. A funding analysis is being conducted. The results of the study will be relevant to the transportation impact analysis because any future transit using the right-of-way being set aside on widened US Route 1 for transit will affect Fort Belvoir's access to higher-speed transit service.

2012 US Route 1 Countywide Transit Network Study (FCDOT, 2012)

This Fairfax County study is to determine the types of transit system needed to support the county's existing and future population. Based on travel patterns and demand in the county, the study selected high volume corridors where Metrorail might be extended and/or where streetcar, light rail or bus rapid transit are appropriate. The study began in January 2012, but further study of the US Route corridor is pending completion of the US Route 1 Multimodal Alternatives Analysis. This study is relevant because it recommended an Enhanced Public Transit Corridors (EPTC) on US Route 1. Route 1 is one of many EPTCs being considered as part of the study, one in the center median that is reserved for transit in the US Route 1 widening plans, another is Fort Belvoir's abandoned rail line. Recommendations from the County Transit Network Study are being integrated into the Fort Belvoir RPMP.

2012 US Route 1 Widening Study and Environmental Assessment (USDOT,FHWA, 2012)

An EA was conducted to assess the impact of widening a 3.4 mile section of US Route 1 between Telegraph Road (Route 611) and Mount Vernon Memorial Highway (Route 235) in Fairfax County, Virginia. The Final Transportation Technical Report, an Appendix to the EA, documented the transportation analysis by assessing the existing conditions and poor level of service due to high volumes and existing road geometry. The report noted in particular locations where turn lanes are inadequate to accommodate turning movements, particularly for left turns. Other issues noted were the spacing and inconsistency of access points along the corridor and sight distance limitations. The EA Traffic Analysis looked at further conditions for a No-Build and Build Alternatives and associated daily and peak hour traffic forecasts for the years 2020 and 2040.

Within Fort Belvoir, the analysis used the higher employment values reflected in the Fort Belvoir Master Plan rather than those included in MWCOG Round 8.0 forecasts. Table 3 in the technical report reflects model employment numbers with projected growth at approximately 45,000 personnel (PN) for 2020 and a projected growth at approximately 57,000 for 2040. The study also notes that Mulligan Road would divert trips from Fairfax County Parkway once Mulligan Road is opened.

Relevance to the transportation impact analysis: The technical report identifies operational results and level of service findings for the intersections along the study area based on projected growth rates similar to the RPMP. The study identifies LOS D and E deficiencies at specific corridor locations. These are the same

intersections evaluated in this TMP. Interchange options called flyover concepts were developed to improve operations at Telegraph Road and Fairfax County Parkway.

2012 Environmental Assessment for the Expansion of U.S. Army Intelligence and Security Command Headquarters Facilities (US Army, 2012f)

This report evaluates the effects on traffic of the proposed renovation/expansion of the INSCOM headquarters. In 2009, 1,650 INSCOM employees worked at the Nolan Building at Fort Belvoir. The models assumed the building expansion would be completed in 2018 and there would be 2,500 total INSCOM employees working at the building. The analysis included three intersections along John J. Kingman Road: Gunston Road, Beulah Street, and the Fairfax County Parkway. The traffic software package Synchro (version 7, Build 773) was used to analyze the existing, future no action, and future proposed action scenarios.

The projected traffic analysis shows that the Gunston Road and Beulah Street intersections will remain at an acceptable LOS. The AM Kingman/Fairfax County Parkway intersection traffic would go from LOS D to E under the 2018 no action alternative and would drop to LOS F under the 2018 proposed action alternative. Traffic operations during the PM peak hour at this intersection have been shown to be at unacceptable levels (LOS F) for all three scenarios analyzed (existing, future no action, and future proposed action). Much of this deterioration is due to background traffic growth, which will result from other Fort Belvoir facilities and residential areas, as well as growth in population and employment in the region.

Relevance to the transportation impact analysis: The Fairfax County Transportation Plan identifies this intersection as well as other intersections along Route 1 and Fairfax County Parkway, to be upgraded to a grade- separated interchange. The County recommendation is included in the Transportation Framework Plan found in the VDP. Traffic analyses performed as part of the EA for the proposed National Museum of the U.S. Army (NMUSA) show a conceptual design for a new interchange at the Fairfax County Parkway/John J. Kingman Road intersection that would improve operations to acceptable LOS levels in 2030. The timing for when the interchange is needed is a function of the actual completion dates for planned projects and background traffic growth. This improvement will be addressed in the future traffic assessment section of this TMP.

2011 Environmental Assessment I-95 HOT Lanes Project (VDOT, 2011))

Assuming background growth levels based on 2030 TransAction Plan and Fredericksburg Area Metropolitan Planning Organization, this study states that within next 25 years, Northern Virginia is expected to add 918,500 new residents (56 percent increase) and over 650,000 jobs. (For comparison, Fort Belvoir 2030 growth projections would represent less than 1 percent of the region's total workforce.) The EA foresees I-95 operating at Level of Service E or F during peak hours within the study area.

The project calls for the construction of two new High Occupancy/Toll (HOT) lanes in the median between Prince William Parkway and its terminus south of Fredericksburg and expands the two existing High Occupancy Vehicle (HOV) lanes in the median into three lanes in the section of I-95 and I-395 north of the Prince William Parkway. The HOT lanes will operate at LOS A to C during peak hours. No change to LOS in the general purpose lanes is anticipated from the reduced volume. VDOT affirmed a commitment to identify opportunities to expand transit and TDM in the corridor including bus bays to serve destinations to Pentagon and Mark Center.

Relevance to the transportation system analysis: The HOT lanes, once completed, should have a positive effect to improve participation levels of ridesharing to Fort Belvoir, particularly from south of the Installation where the majority of employees live. This improvement has been incorporated into the RPMP Transportation Management Plan and the Installation Vision and Development Plan.

2010 Fort Belvoir Comprehensive Traffic Engineering Study (US Army, 2010o)

This study was developed to assess existing traffic operations within Fort Belvoir. The study assumed background growth that included the 2005 BRAC population plus an additional 6,000 personnel at the installation. The study was tasked with evaluating short term and long term traffic needs and made recommendations for roadway improvements.

To assess the traffic operations, a field study was conducted and traffic counts were collected in December of 2009 and analyzed to obtain LOS. The study proposed improvements for 18 intersections and the upgrade of the entire corridor of Gunston Road between the intersection with Goethals Road and 16th Street. The proposed improvements included: replacing fixed sign posts with breakaway posts, replacing old signs with signs compliant with the new standards, refreshing and adding pavement markings, installing pedestrian indicators, trimming trees, and repairing potholes. The study also assumed the reconstruction and reopening of Lieber Gate. All BRAC road improvements assumed to be in place by 2011 have largely been completed.

Relevance to the transportation impact analysis: Implementation of all remaining intersection improvements will improve baseline traffic conditions on the installation.

2010 Commissary/Post Exchange Traffic Impact Study (Civiltech, 2010)

Part of the Upper North Post development is a new Community Support Center comprised of the 132,000 square foot Commissary and the 270,000 square foot Post Exchange, with expected completion in 2015. The impact of new traffic generated by these facilities on the existing roadway network has been analyzed and recommendations for improvement have been proposed. The existing roadway cross-sections are appropriate for the anticipated traffic volumes with two exceptions, both recommended to be widened:

- Gorgas Road between Gunston Road and Main Commissary driveway.
- Kingman Road between Gunston Road and the Main Post Exchange driveway.

Relevance to the transportation impact analysis: Proposed roadway improvements noted above will need to be timed to occupancy of the Commissary and PX to mitigate additional traffic generated by the new facilities.

2010 Fairfax County Parkway Traffic Technical Report (FCDOT, 2010)

This study focused on the traffic analyses for improvements at interchanges along Fairfax County Parkway (Virginia Route 286, formerly Virginia Route 7100) in the vicinity of the Fort Belvoir North Area. The results of these analyses were used in the development of the final design, and design improvements for these interchanges.

Relevance to the transportation impact analysis: This study may influence future traffic interchange improvements and design recommendations within the FBNA site.

2009 Museum Interchange Analysis - Subsequent Study at Fairfax County Parkway and Kingman Road (Gorove/Slade, 2009)

This study followed the 2008 Museum Corridor Study and was conducted to provide a high level conceptual design for a proposed interchange on the Fairfax County Parkway serving the future NMUSA access road and Kingman Road.

Relevance to the transportation impact analysis: Implementation of the interchange improvements will be needed to achieve the long-term projected growth levels.

2008 Museum Corridor Study (Gorove/Slade, 2008)

The new National Museum of the United States Army has been planned in two phases during which buildings and associated landscape will be constructed. A study of the existing traffic volumes was developed to determine the impact generated by this facility on the existing roadway network. The data analyzed was gathered from previous studies and assumed the BRAC population with a 1 percent growth rate compounded annually for 5 years. The result was recommended improvements for the intersection at Fairfax County Parkway and Kingman Road including the addition of a traffic signal and modifications to the turning lanes.

For the long term, the study recommended an elevated interchange be constructed to facilitate access and egress. In addition, future Light Rail Transit or Bus Rapid Transit was proposed for U.S. Route 1 and Fairfax County Parkway to help support the increased traffic generated by the facility.

Relevance to the transportation impact analysis: Identification of recommended improvements.

2008 National Geospatial-Intelligence Agency (NGA) Traffic Analysis (Belvoir New Vision Planners)

This study analyzed the access and traffic circulation during and after construction of FBNA via the Fairfax County Parkway and Backlick Road. The traffic analysis conducted as part of this study concluded that traffic generated by the NGA development will introduce higher traffic volumes that will result in congestion on both Fairfax County Parkway and I-95. In order to alleviate congestion, the improvements proposed included ridesharing, shuttle bus, work shifts and priority parking for HOVs.

Relevance to the transportation impact analysis: The study remains relevant with regard to NGA trip generation, trip distribution and assessment of the impacts of the Defense Access Roads (DAR) access ramps, and ingress/egress into the FBNA.

2008 Proposed Highway Improvements, I-95 Defense Access Roads Ramps to the Engineer Proving Ground (Fort Belvoir North Area, FBNA), Fort Belvoir, Virginia, Environmental Assessment (USDOT, FHWA, 2008)

This study resulted in the construction of two access ramps from I-95 to the FBNA to improve access to and egress from the site to accommodate vehicle travel resulting from the BRAC-mandated relocation of some 8,500 employees to the eastern part of the site.

Relevance to the the transportation impact analysis: The study projected that the ramps will improve the level of service on the southbound I-95 to westbound Parkway ramp in the AM peak-hour from “F” to “C.” In the PM peak-hour, the level of service on the eastbound Parkway to northbound I-95 ramp would improve from level of service “F” to “E.”

2007 Final Environmental Impact Statement (FEIS) for implementation of 2005 Base Realignment and Closure (BRAC) (US Army, 2007a)

The FEIS evaluated the effects of the alternatives for the year 2011 to determine how to allocate the functions and facilities at the Installation due to BRAC.

The FEIS identified significant transportation effects that would be limited to the Fort Belvoir North Area entrance points, Pence Gate, Tulley Gate, and the immediately adjacent transportation facilities including U.S. Route 1, I-95, Fairfax County Parkway, and Backlick Road.

The following mitigation measures were recommended to decrease the adverse impacts on traffic:

- Reconstruction (with direct connections to the HOV lanes) of the I-95/Fairfax County Parkway interchange

  - Status: A new interchange and ramps between FBNA and Fairfax County Parkway have been completed.
  - Status: Improvement of Fairfax County Parkway to four or more lanes from Franconia-Springfield Parkway to I-95 was completed in 2010
  - Status: A direct connection from FBNA to the Southbound HOV lanes is scheduled for completion
  - Status: A ramp between the HOT lanes and Alban Road at the I-95 interchange at Fairfax County Parkway is scheduled for completion
- US Route 1 Widening
  - Status: Funded and final design underway to widen 3.5 mile section along Main Post to six lanes; target completion date is mid-2016
- Rideshare facilities
  - Status: New Saratoga Park and Ride Lot at the FBNA/Barta Road interchange with Fairfax County Parkway completed and opened December 2012
- Transit center/facilities
  - Status: Potential Sites along Route 1 reflected in the County Comprehensive Plan and Fort Belvoir Master Plan; Fairfax County-wide transit expansion recommendations and Richmond
- Corridor Public Transit Initiatives
  - Status: Included in the FY 2012-2017 Capital Improvement Plan
- Expanded bus service
  - Status: Fairfax County launched Fairfax Connector 335 service from Franconia-Springfield Metro Station to Fort Belvoir. Other bus route updates are discussed in Section 2.
- Additional U.S. Route 1 crossing for Main Post
  - Status: The VDP proposes a second Route 1 crossing to connect Doerr Road and Goethals Road
- Fairfax County Parkway/John J. Kingman Road intersection improvements
  - Status: Completed museum interchange analysis in 2009
- Franconia-Springfield Parkway/Neumann Street interchange
  - Status: County Project
- Improvements to Beulah, Telegraph, Backlick, Loisdale, and Newington Roads
  - Status: County Project
- Widening of Rolling Road Loop Ramp at the Fairfax County Parkway/Franconia-Springfield Parkway/Rolling Road Interchange
  - Status: Funded for construction by VDOT with completion anticipated in 2015

Relevance to the the transportation impact analysis: The FEIS reviewed available capacity and found that the existing transportation network is operating at or near capacity during peak periods in peak directional traffic. According to this analysis, regional growth is more of an influence on the traffic than the influx due to BRAC. The FEIS overestimated the total population to be on the Installation by approximately 6,000 PN for a total of 45,266 PN compared to the post-BRAC population in 2011 of roughly 39,000 PN. This is largely as a result of the shift of Washington Headquarters Services to the Mark Center and other projected

changes in employment levels. The FEIS population is about 10,000 people less than 56,000 PN identified in the VDP for FY 2030.

The FEIS traffic assessments for the FBNA remain the most relevant for this TMP, which evaluated the impacts of the 2030 build-out to 17,763 personnel. Presently, only 8,500 personnel are located at FBNA. In short, the FEIS traffic study evaluated the impact of adding an additional 9,263 personnel compared to the 7,500 PN proposed under Development Option #2 and did not consider the following committed roadway improvements such as:

- Reconstruction (with direct connections to the HOV lanes) of the I-95/Fairfax County Parkway interchange
- Additional or improved ramps to and from I-95 for FBNA
- Six-lane widening of Route 1
- Four-lane Mulligan Road

2006 Richmond Highway-Telegraph Road Connector (Mulligan Road) Fairfax County, Virginia Environmental Assessment (USDOT, FHWA, 2006)

This study evaluated environmental impacts related to a replacement connector road between U.S. Route 1 and Telegraph Road (VA Route 611) in the vicinity of Fort Belvoir since the once public-access Woodlawn Road is now closed to the public. The study area also encompassed the existing southbound I-95 flyover to Backlick Road.

The study assumed that the widening of U.S. Route 1 and Telegraph Road would be completed by 2015. The impact of Alternative 1 on the traffic volumes of other roadways in the study area was forecast to be insubstantial.

Relevance to the the transportation impact analysis: The EA confirmed that Mulligan Road will restore the link between Route 1 and Telegraph Road which provides the transportation system in the vicinity of Fort Belvoir more flexibility. Mulligan Road is currently under construction with completion expected by 2014.

Reconstruction of the I-95/Fairfax County Parkway Interchange (VDOT)

This interchange is currently under study by VDOT, but there is no identified funding for construction. It should be noted that this is a separate project from the I-95

southbound ramp to FBNA that was completed in 2011, or from the I-95 HOV Ramp to FBNA that is currently under construction and scheduled to be completed in December 2014.

D.3 TRAFFIC IMPACT ANALYSIS APPROACH

D.3.1 Study Scope

The traffic studies and analyses performed for this project were done in conformance with VDOT's requirements for Traffic Impact Analysis (TIA). These requirements were established in response to Chapter 527 of the 2006

Acts of the Virginia Assembly, which directs the Virginia Department of Transportation (VDOT) to promulgate regulations for Traffic Impact Analysis. VDOT's TIA regulations address the topics and scope of the materials to be included in the Traffic Impact Analysis.

The major items included in a TIA prepared under the Chapter 527 Regulations are:

- An Introduction and Summary

- Background information on the Study Area
- An Analysis of the Existing Conditions
- Trip Generation from the Site
- Site Traffic Distribution and Assignment to the roadway network
- Analysis of Future Conditions with Development
- Recommended Improvements and
- Conclusion.

All of the information and analyses associated with these topics is also contained in the RPMP TMP. Much of the background information is contained in the TMP. The following sections correspond with the traffic-specific and transportation management plan aspects of the TIA requirements.

D.3.2 Study Area Limits

The general study area for this project was determined with the aid and input of the Agency Advisory Group (AAG) that was comprised of representatives from the Virginia Department of Transportation and the Fairfax County Parkway Department of Transportation. The traffic survey intersection locations identified for assessment in this study are based on the combined knowledge of development and traffic flow on and around the Post, as well as sites included in previous traffic studies. The study area that resulted from the discussions that took place with the AAG includes a total of 76 sites, as shown in Table D.1 and Figure D.1. (The sites are numbered from 1 to 69; however, seven have “a” and “b” suffixes.) It should be noted that in addition to intersections, some of these locations are merging areas or diverging areas or weaving areas on limited access roadways.

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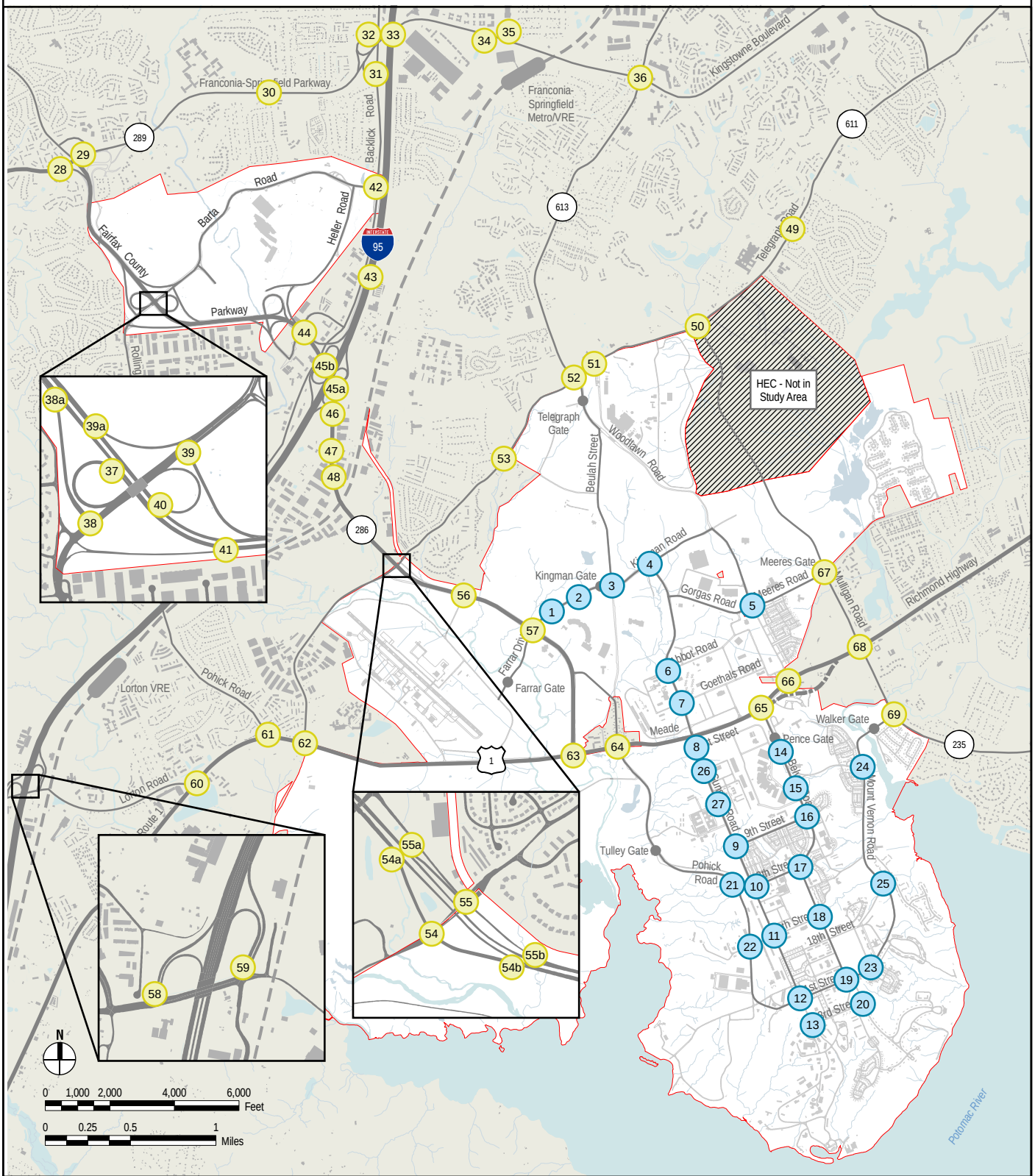
Study Area Traffic Survey Locations



Traffic Survey Location - Belvoir Intersection

Traffic Survey Location - Public Road Intersection

Source: US Army, 2014c

Fort Belvoir RPMP EIS

D.1

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Table D.1
Traffic Survey Locations

Fort Belvoir Intersections	
1	John J. Kingman Road and DLA West Gate
2	John J. Kingman Road and DLA East Gate
3	John J. Kingman Road and Beulah Street
4	John J. Kingman Road and Gunston Road
5	Gorgas Road and Woodlawn Road
6	Gunston Road and Abbot Road
7	Gunston Road and Goethals Road
8	Gunston Road and 1st Street
9	Gunston Road and 9th Street
10	Gunston Road and 12th Street/Pohick Road
11	Gunston Road and 16th Street
12	Gunston Road and 21st Street
13	Gunston Road and 23rd Street
14	Belvoir Road and Traffic Circle
15	Belvoir Road and Surveyor Road
16	Belvoir Road and 9th Street
17	Belvoir Road and 12th Street
18	Belvoir Road and 16th Street
19	Belvoir Road and 21st Street
20	Belvoir Road and 23rd Street
21	Theote Road and Pohick Road
22	Theote Road and 16th Street
23	Flagler Road and 21st Street
24	Mount Vernon Road and Surveyor Road
25	Mount Vernon Road and Gillespie Road
26	Gunston Road and 3rd Street
27	Gunston Road and Jackson Loop North
Public Road Intersections	
28†	Franconia-Springfield Parkway Eastbound Exit Ramp to Rolling Road
29†	Franconia-Springfield Parkway Westbound on Ramp from Rolling Road
30	Franconia-Springfield Parkway and Spring Village Drive
31	Backlick Road at Franconia-Springfield Parkway Eastbound Ramps
32	Backlick Road at Franconia-Springfield Parkway Westbound Ramps
33	Franconia-Springfield Parkway and Interstate 95 HOV Ramps
34	Frontier Drive at Franconia-Springfield Parkway Eastbound Ramps
35	Frontier Drive at Franconia-Springfield Parkway Westbound Ramps
36	Franconia-Springfield Parkway and Beulah Street
37†	Southbound Barta Road to Eastbound Fairfax County Parkway
38	Barta Road at Fairfax County Parkway Eastbound Ramps
38a†	Fairfax County Parkway Southbound exit to Barta Road

Fort Belvoir Intersections	
39	Barta Road at Fairfax County Parkway Westbound Ramps
39a†	WB Barta Road entrance to Fairfax County Parkway NB
40†	NB Barta Road to WB Fairfax County Parkway
41	NB Barta Road to Eastbound Fairfax County Parkway
42	Barta Road and Backlick Road
43	Interstate 95 HOV Access Ramp
44†	Interstate 95 Southbound Exit Ramp to Heller Road
45a	Fairfax County Parkway SB/EB Weave over I-95
45b	Fairfax County Parkway NB/WB Weave over I-95
46	Fairfax County Parkway and Loisdale Road
47	Fairfax County Parkway and Terminal Road
48	Fairfax County Parkway and 750' South of Terminal Road
49	Telegraph Road and Hayfield Road
50	Telegraph Road and Mulligan Road
51	Telegraph Road and Road B (DCEETA Entrance)
52	Beulah Street and Telegraph Road
53	Telegraph Road and Newington Road
54	Telegraph Road at Fairfax County Parkway EB Ramps
54a†	Fairfax County Parkway Southbound exit to Telegraph Rd
54b†	Telegraph Road SB exit to Fairfax County Parkway
55	Telegraph Road at Fairfax County Parkway WB Ramps
Public Road Intersections	
55a†	Telegraph Road entrance to Fairfax County Parkway NB
55b†	Fairfax County Parkway Northbound exit to Telegraph Rd
56	Fairfax County Parkway at Ehlers Road
57	Fairfax County Parkway and John J. Kingman Road
58	Lorton Road and Interstate 95 Southbound Ramps
59	Lorton Road and Interstate 95 Northbound Ramps
60	Route 1 and Lorton Road
61	Route 1 and Pohick Road
62	Route 1 and Telegraph Road/Old Colchester Road
63	Route 1 and Fairfax County Parkway
64	Pohick Road and Route 1
65	Belvoir Road and Route 1
66	Woodlawn Road and Route 1
67	Mulligan Road and Mill Road/Pole Road
68	Mount Vernon Memorial Highway and Route 1
69	Mount Vernon Memorial Highway and Mount Vernon Road

D.3.3 Traffic Data Collection

The collection of most of the traffic data on public roads spanned a 16-month period between October 2011 and January 2013. The initial traffic turning movement counts were collected in October 2011 and January 2012 and focused on seven intersections near Main Post. A second series of count was taken in November 2012 and January 2013, including turning movement counts at 22 intersections and 19 roadway tube counts on mainlines and ramps surrounding the FBNA. An additional data set was collected in November 2013 at four intersections to address movements at three I-95 interchanges. The data for the remaining intersections, merge/diverge/weaving areas, which were not counted (or did not exist at the time of the study), were estimated using data collected at nearby locations.

New intersection data were collected using video-based turning movement counts. Data were collected for three hours in the AM and PM peak periods on two consecutive midweek days (Tuesday, Wednesday, or Thursday). At each location, the starting time of the peak hour was determined separately for each day of data. Volume data for merge, diverge and weaving areas were collected using road tube counters that were installed for a minimum of two days. Where individual movement volumes during the peak hours were consistent on both days, the peak hour volumes shown in these tables reflect the average of these two peak hour volumes. If the volumes for an individual movement were not consistent between the peak hours, the higher of the two volumes is shown for that movement. The resulting traffic counts are shown in Section 3.4.3.2 of the EIS and Chapter 5 of the TMP.

D.3.4 Traffic Analysis Assumptions and Procedures

D.3.4.1 Agency Engagement

Beginning in the fall of 2012, Fort Belvoir DPW, ENRD, the NEPA consultant, and master plan/transportation consultant team met with representatives of the Virginia Department of Transportation (VDOT) and Fairfax County Department of Transportation (FCDOT), herein referred to as the Agency Advisory Group (AAG). The purpose was to develop the traffic analysis scope and methodologies. This dialogue provided an open forum to discuss study objectives, refine the traffic modeling approach and methodologies with a common goal of understanding how Fort Belvoir's future growth affects the local transportation network. In all, there were four In- Progress Review meetings conducted on 1 May 2013, 12 August 2013, 24 October 2013, and 21 November 2013 to provide feedback and guidance on the development of the traffic model and the draft study findings to achieve the desired outputs.

As part of this process, the AAG requested and were provided two documents, or "white papers," to clarify the traffic analysis scope and to document the key assumptions and procedures that would be used for the TMP traffic analysis and the accompanying EIS analysis. These documents include:

- Traffic Analysis Approach, November 29, 2012, hereinafter referred to as the "Approach"
- Applying Fort Belvoir's Transportation Management Plan to the Traffic Analysis Models, December 28, 2012.

The Agency Advisory Group reviewed the Installation- proposed traffic analysis scope and submitted comments and written responses to the comments provided on 31 January 2013. The refinement of the traffic analysis scope as a result of AAG input formed the basis of this traffic analysis.

The following is a summary of some of the highlights that came out of the discussion and in-progress review meetings.

Use of COG Model

Upon review of the difference in zone and network detail present in the existing Fairfax County subarea model as compared with the Version 2.3 of the TPB model, the AAG agreed to use Version 2.3 of the TPB

model, potentially with some limited zone splits and added detail to the study area (subject to data availability). These modifications were presented to stakeholders and were made to support the analysis requirements of the study.

The regional model (Version 2.3) has been calibrated and validated for regional use, with reasonableness checking that was performed on assignment results in the study area. Two approaches were incorporated in handling the findings from these checks. These included corrections made in network coding to improve the model fit, and post-processing and/or interpretation of the analysis results where differences were observed and estimated trips noted.

Evaluation Tools and Process

The transportation system performance approach was based on the volume/capacity ratios per NCHRP Report 387. This approach was determined to be acceptable by the AAG.

Development of Site-specific 2017 Volume Forecasts

Clarification of 2017 Short-Term Traffic Growth Factor Development

As originally conceived, the traffic study assumed a 2 percent annual growth factor for traffic that was not associated with Fort Belvoir. This assumption was reviewed with the AAG to determine its reasonableness.

It was agreed that while application of a 2 percent growth rate is reasonable for most arterials, the dynamic changes taking place in the study area made the uniform use of this growth rate unreasonable. These changes include: new buildings generating new trips in several areas inside and outside of Fort Belvoir; significant roadway network improvements such as the opening of Mulligan Road, the widening of Route 1, and new access ramps to I-95; and the opening of Lieber Gate, a new access point to the Main Post north of Route 1. The AAG agreed that the 2017 volumes would be derived from growth factors reflecting the differences between the model outputs reflecting the 2013 network, and the outputs for the 2017 networks

and growth scenarios. These differences would be used to derive a series of "growth factors" for the individual links, and where feasible, the individual turning movements.

Development of 2017 Traffic Volumes

As indicated in the preceding section, the 2017 traffic volumes for the movements at each intersection were derived by applying the growth factors at each intersection. An extensive series of traffic counts were made in 2012 and 2013 to collect existing volumes for the individual sites. While the vast majority of these sites were intersections, several were merge areas, diverge areas and weaving areas on limited access highways.

An initial estimate of the 2017 volume at the intersections was made by applying the growth factor to the existing volumes. A reasonableness check was then conducted by comparing the 2017 volume obtained through the application of the growth factor, with the 2017 volume estimated by adding the value of the change in the forecast to the existing volume.

Where the two forecast volumes differed significantly, the average of the two forecasts was used. In cases where one of the forecast volumes did not appear to be reasonable, the forecast volume closest to the existing volume was used.

Similar procedures were used at merge, diverge, and weaving areas, and the intersections within the Main Post of Fort Belvoir.

Calculation of Delays and Level of Service

2017 traffic volumes for each scenario obtained through the procedure described in the preceding paragraph were input into the Synchro (Synchro Version 8.0, Build 802, Trafficware, Ltd.) signal timing program to

calculate the delays, level of service, and other parameters of interest at each intersection. Signal timing for the analysis were based on VDOT's Synchro files and is consistent with VDOT timing plan development.

Regional Model Refinement Notes

Assumptions on Route 1 Widening

Although Route 1 widening is in the CLRP as a 2030 improvement, the schedule for completion of Route 1 construction is summer 2016. Calendar year 2017 seemed a reasonable expectation, and it was agreed to include it as a built project in the 2017 model.

Evaluating LOS for I-95 and Several Agreed Upon Interchanges

Fort Belvoir agreed to expand the traffic study area limits to include additional interchanges, as requested by the stakeholders, while recognizing there are many factors that influence the LOS on I-95 and the outer areas of the study limits. The 48 public road sites (intersections and merge, diverge and weaving areas on limited access roadways) formed the basis of the traffic study analysis sites in the 2017 analysis.

Clarification on Current SOV Use, No Growth and Applying the TMP Effectiveness

For 2017, the TMP target of 10 percent SOV reduction assumes a reasonably achievable 75 percent SOV mode split. This is based on the more conservative 85 percent SOV estimate as the starting point and not the 81 percent SOV results obtained from the recent survey. For the short term, the goal of 75 percent maximum SOV use, measuring the non-SOV vehicle impacts on the road was used. This trip making reduction was investigated as a stand-alone analysis and was not directly incorporated into the outputs used in the development of the 2017 network volumes and site-specific volumes.

For 2030, the TMP targets further reductions resulting in a 60 percent SOV use with the underlying assumption that some form of improved transit service, in addition to the service that is currently available to the Installation's workforce, will be in place by 2030.

Actual vehicle trips on the roadways vary based on the percentage of commuters that will be from 2-, 3-, or 4-person or more carpools, bus or from other TMP measures. An estimate of the 2017 and 2030 total vehicle trips, based on the targeted TMP mode splits for the short- and long-term horizon years, is presented in Section 7.8 of the TMP that estimates the total vehicle trips if the target mode choices are achieved.

Long-term Traffic Assessment (2030 and Growth on Public Roads)

This study considers the Route 1 widening EA information as a reference forecast with outputs from new model runs since the specific RPMP 2017 and 2030 project assumptions vary from prior EA work. The results form the Fort Belvoir study and the Route 1 EA were found to be reasonably comparable.

Assumptions on Super NoVa Study and Other Transit Studies

The No-Build scenario and alternate traffic studies only incorporate transit improvements that are already part of the CLRP. In the Build scenario, added transit improvements could be inspired by a variety of prior or current work, including the Super NoVa or the Countywide Transit Network. However, these potential transit facilities are not reflected in the 2017 modeling. TMP effectiveness reductions for 2017 are based on increased rideshare/ bus use or other modes in order to provide reasonably achievable results.

2017 Trip Generation from Fort Belvoir

The study evaluates travel behavior characteristics of the various sub-populations within the Installation, and this was divided into two subgroups: Residents and Non-residents. The residential population, which includes Family housing, Soldier barracks and privatized Army lodging, is expected to remain relatively

constant, and hence the number of trips they produce is not anticipated to change significantly. The model does, however, reflect changes to residential communities by 2030 such as the new North Post Town Center and resulting decrease of resident population levels in places like Dogue Creek.

The travel behavior of the non-residents is assumed to be similar to the existing non-residents. Mode choice behavior is assumed to consider cost and travel time by different modes for different TAZs in the study areas. Route choice (access and egress distribution through available gates) for future TAZ non-residents is assumed to be made considering travel time and cost in the same way as current TAZ non-residents, but with consideration of travel time and cost changes as a result of transportation system improvements such as the Route 1 widening, the opening of Lieber Gate and Mulligan Road by 2017.

Distribution of Fort Belvoir Traffic to/from Different Areas

Distribution from the Fort Belvoir TAZ to the gates and the distribution to the external roadway network were based on the regional model (Version 2.3). The initial distribution results were presented in the in-progress review meetings, and minor adjustments made with the participation of the AAG to ensure consensus.

Assignment of Fort Belvoir Traffic to Specific Roadways

Trip assignments on specific roadways were reconciled at the in-progress working sessions with the AAG. This included, for example, the assumptions on trip assignments and the distribution of traffic that will occur with the projected completion of Mulligan Road within the Route 1 and Telegraph Road corridor.

Assumed 2017 Transportation System

The application of additional transportation improvements in the network that the Agency Advisory Group agreed would reasonably be in place by 2017 have been captured in the short-term traffic assessment model. This includes the decision to include the six-lane Route 1 widening by 2017.

Evaluation Tools and Processes

The AAG agreed that the use of Synchro is appropriate for identifying potential problems at intersections in the future and assessing the need for additional capacity. The analysis of freeway segments and ramps such as the Fairfax County Parkway interface with the I-95 ramps was performed using Highway Capacity Software (HCS).

Background 2030 Traffic

Background traffic for the 2030 analysis incorporates assumptions about future development throughout the region based on the TPB Version 2.3 model. This reduced the complexity of the reconciliation issues in that only the TPB model inputs were needed to be reviewed for the potential development double counts. The land use assumptions broken out by TAZ zones were reviewed during the in-progress review meetings by appropriate stakeholders.

Fort Belvoir 2030 Traffic Trip Generation, Distribution and Assignment

The No-Build and Build scenarios presented in this section are intended to address differences in the future land use intensity as well as transportation network and program differences. That is, the plan with the model was to assign an adjusted trip table for the build scenario and then look at differences in network conditions under the Build and No- Build scenarios. In addition to using the model, results from the surveys and professional judgment may be employed in developing findings and recommendations. An evaluation framework was then further outlined as part of the work plan and was reviewed with the project stakeholders.

Assumed 2030 Public Transit Systems

The TMP Application or Effectiveness refers to the potential types of transit improvements that could occur in the future along Route 1 such as those described in the SuperNoVa Study and the currently pending Route 1 Multimodal Study. In addition, Fairfax County's Transit Network Study may include a different recommendation for the specific type(s) of transit improvement to best serve the area. While no one study has been accepted by regional stakeholders, the Master Plan does consider that some form of enhanced public transit will take place by 2030. In short, the plan anticipates that public transit service will continue to improve over time; in fact it already has in the form of improved bus (express) services.

The proposed Master Plan recognizes these transit studies and has developed a land use plan that concentrates on future employment centers to take advantage of new transit services. As described above, the No-Build traffic scenario will incorporate the transit improvements that are part of the CLRP. However, in the Build scenarios, the analysis assumes some type of enhanced public transit corridor (EPTC) on Route 1. The EPTC is an adopted element in the county's Transportation Plan and provides the rationale for exploring a range of moderate and more aggressive TMP effects. The traffic models that reflect SOV reductions consider that there will be an increased rider demand for public transit when/if these services become available to Fort Belvoir.

Other Items Discussed with Agency Staff

Clarification on TDM Coordinator

The role of the TDM Coordinator has evolved from the initial BRAC effort to a more permanent organizational structure. The TDM Coordinator is now located and managed by the Plans, Analysis and Integration Office (PAIO) located on Fort Belvoir. The PAIO is responsible for the Army stationing process. It maintains the workforce population database, websites, and reporting to senior Army leadership and helps to guide the strategic vision for future long range goals. The TDM Coordinator is supported by the Public Affairs Office and the Directorate of Public Works staff. Working closely with DPW's Chief of Facilities Planning and agency ETCs, the primary role of the TDM Coordinator is to get people out of their cars.

Clarification of SOV Reduction for TMP

Based on post-BRAC commuter survey results, a 4 percent decrease in SOV use to 81 percent was noted from 2008 to 2011. The percentage indicates a downward trend in SOV use, which may be more or less than 4 percent based on actual SOV trips. However, based on both survey results and other factors, the TMP will consider 85 percent to be the existing SOV condition for purposes of measuring improvements and traffic impact.

Fort Belvoir Intersections

Twenty-seven intersections inside the Fort Belvoir perimeter are included in this traffic assessment. The extensive construction activities within Fort Belvoir from BRAC were largely completed by June 2012, allowing the more recent traffic collection counts to reflect adjustments to travel patterns resulting from the new tenants to the Main Post and FBNA area. The locations of the sites are identified in Table D.1 and shown on Figure D.1.

Public Road Intersections

The 49 public road sites include external intersections and additional ramp locations on roadways that connect Fort Belvoir to the surrounding community and major limited access roadways. The locations of these sites are identified in Table D.1 and shown on Figure D.1.

Fort Belvoir North Area

New traffic counts at Fort Belvoir North Area (FBNA) are part of this assessment. Figure D.1 shows the traffic count locations, the majority of which were included in the 2007 FEIS (summarized in Section D.2).

Defining Operational Metrics by Delay and Density

Delay per vehicle is the major parameter derived by the computations performed by the Synchro program. It is calculated for each individual movement and then summed to provide the average delay for each approach, and for the intersection as a whole. It is measured in seconds per vehicle (s/v). The Level of Service (LOS) for the intersection is taken from average value of delay at the intersection and then expressed as a letter value that ranges from A to F. The delay ranges associated with each LOS are shown in Table 3.4-1 in the EIS.

The LOS for the merge, diverge and weaving areas are based on the space available for vehicles to change lanes within these areas. As the number of vehicles in the area increases, each vehicle's movements becomes more constrained by the vehicles nearby. The number of vehicles on a section of roadway is expressed in terms of "density" and is measured in passenger cars per mile per lane (pc/mi/ ln). Table 3.4-1 in the EIS shows the range of densities associated with each LOS in the merge, diverge and weaving areas

D.4 TRAVEL DEMAND FORECASTING

As previously stated, the goals of this transportation study were to assess the transportation system impacts of future growth at Fort Belvoir in the short term (2013-2017) and in the long term (2017-2030). This section provides a description of the travel demand forecasting model that is used as the basis for this study, a summary of refinements that were made to better represent the study area, and a discussion of the application of the model results in developing future intersection and ramp volumes for detailed analysis.

D.4.1 Travel Demand Forecasting Model

The Metropolitan Washington Council of Governments (MWCOG)/National Capital Transportation Planning Board (TPB) regional travel demand forecasting model Version 2.3.39 was used in this study. This model was recently used in the Air Quality Conformity Determination of the 2012 Financially Constrained Long Range Transportation Plan (CLRP) and FY 2013-2018 Transportation Improvement Program (TIP), reflecting the latest planning assumptions at the beginning of this corridor study. Two major inputs to the model include: 1) the transportation network that represents the 2012 CLRP and FY 2013- 2018 TIP, and 2) land use - MWCOG Round 8.1 Cooperative Forecasts.

The Version 2.3.39 is a sophisticated, conventional trip- based travel demand model with six major steps:

- Demographic models with market stratifications by four household income groups, four household size groups, and four vehicle availability groups;
- Trip generation models for five personal trip purposes, a commercial vehicle trip purpose, and two truck trip types;
- Trip distribution model with doubly-constrained gravity model formulation with a composite impedance of transit and highway travel times;
- Mode choice model with nested logit structure for five trip purposes and two time periods;
- Time of day model with four time periods - AM peak, midday, PM peak, and night time/early morning; and
- Traffic assignment with six user classes and equilibrium assignment methodology.

D.4.2 Travel Demand Model Refinements

The regionally adopted travel demand forecasting model for air quality conformity includes two special features to address special issues of transportation in the region: The "transit constraint" that constrains Metrorail ridership into the core and "HOV3+ skims substitution." The "transit constraint" allows only a predetermined level of Metrorail ridership into the core (the 2020 level), and if the model calculates a higher level of demand, these excess trips are shifted directly to the single-occupancy vehicle mode. This feature is designed to represent the Metrorail-related capacity constraint in the core area and to produce a conservative output in terms of air quality and shows a worst case scenario in terms of roadway congestion. It is acknowledged, though, that the actual behavior of Metrorail riders when faced with congested conditions in the Metrorail system may be different than assumed by the transit constraint feature. Travelers who would prefer Metrorail might shift the time of day of their commutes or seek out commuter rail, commuter bus, local bus, carpool, or TDM alternatives, in addition to some portion choosing to drive instead. It is, therefore, a recommended practice to turn the Metrorail capacity constraint feature "off" when performing planning studies and has been done in this study. However, it is important to understand that in doing so, the forecast Metrorail ridership might not be achieved without improvements to the carrying capacity of the Metrorail system.

The "HOV3+ skims substitution" is specifically formulated to model the HOT lanes in Northern Virginia. The operational requirements of a HOT lane stipulate that a certain prevailing speed on the HOT facility should be maintained by adjusting the tolls in real time. In addition, HOV3+ service levels will not be affected by the HOT operation. To achieve these operational objectives, the TPB Version 2.3 model employs a two-run procedure, with the "base" run to develop HOV3+ skims and the "final" to simulate the HOT operation.

In this corridor study, these two special features were treated as follows:

- The HOV skims were calculated using the same highway network as the non-HOV skims;
- The assignment of HOV trips was done with all other trips for the specified time periods; and
- The transit constraint on the trips going to the D.C. Core was not included.

Transportation Analysis Zone Structure

The study area consists of seven TPB/MWCOG transportation analysis zones (TAZ), two on North Post and five in the Main Post area. These TAZs were refined to 16 to increase the spatial resolution and representation of the land use activities and network detail in the study area. The refined TAZ structure has 16 TAZs in the study area, with 14 TAZs in the Main Post area. Figure D.2 shows the refined TAZ structure. Appendix F.2 of the TMP TAZ Structure for 2017 and 2030 Employment and Household Populations includes the population counts assigned to each TAZ zone and is included in the traffic model.

Land Use Forecasts

The land use forecasts used in Version 2.3.39 is MWCOG Round 8.1 Cooperative Forecasts. At the beginning of this project, Fairfax County developed the draft Round 8.2 forecasts, which were provided to the Consultant to replace the Round 8.1 forecasts in the regional model. However, the Round 8.2 forecasts do not reflect the latest information on the planned developments and growth in the Fort Belvoir area. For the Fort Belvoir study area, the consultant developed a new set of land use forecasts, based on proposed developments and improvements in this Real Property Master Plan Transportation Management Plan. Table D.2 shows a study area summary of population (that includes residents, Soldiers and lodging) and employment forecasts in 2017 and 2030, Built Alternative 1. As can be seen from the table, the population in the study area remains stable over the forecasting period, while employment grows to different degrees. The traffic analysis assumes implementation of all components of the Master Plan, including:

- The Short Range projects with construction starting from 2012 to 2017; the Installation Vision and Development Plan (formerly Long Range Component) (that includes short range and long range projects to be implemented from 2018 to 2030); the Installation Planning Standards (formerly Installation Design Guide); the Transportation Management Plan; the Installation Development Program (formerly Short Range Component and Capital Investment Strategy); and the Complete Plan Summary (formerly the Real Property Master Plan Digest). Full implementation of the proposed short-term projects would increase the Installation employment from roughly 39,000 in 2012 by approximately 5,000 to 44,000 by 2017, while the proposed long-term projects would add approximately 12,000 bringing the total 2030 workforce to 56,000.

Table D.2
Population and Employment Forecast Summary

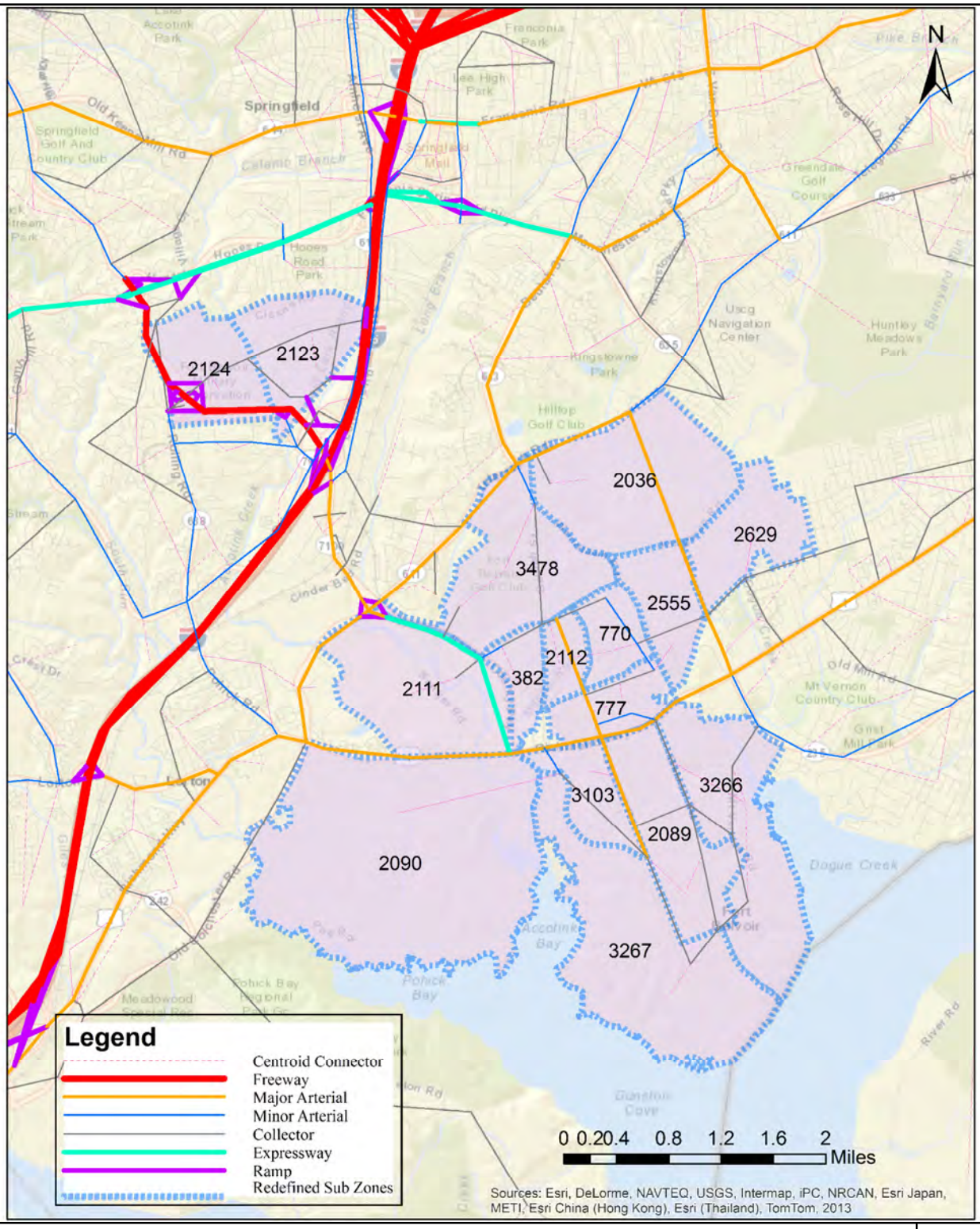
Fort Belvoir Population and Employment Forecast Summary		
Scenarios	**Population**	**Employment**
2013	9,100	39,869
2017 No-Build	9,100	39,869
2017 Alternative 1	9,100	44,136
2017 Alternative 2	9,100	43,136
2017 Alternative 3	9,100	40,624
2030 No-Build	9,100	39,869
2030 Alternative 1	9,100	56,166
2030 Alternative 2	9,100	50,016
2030 Alternative 3	9,100	54,800

Transportation Network

The transportation network in the study area and vicinity areas was reviewed by the consultant team, as well as representatives from the AAG and enhanced to better represent the existing condition and planned improvements as documented in the regional Constrained Long Range Plan (CLRP) and various studies in the study area.

Figure D.3 shows major roadway improvement projects included in the 2012 Financially Constrained Long Range Transportation Plan (CLRP) and FY 2013-2018 Transportation Improvement Program (TIP), while Table D.3 lists these projects with short descriptions. The highway network was added with more detail to be consistent with the refined TAZ structure and the intersections under study. Network attributes such as facility types and the number of lanes were reviewed and refined in the study area and its vicinity. The refined network was then reviewed by the AAG.

Redefined Transportation Analysis Zones



Source: US Army, 2014c

Fort Belvoir RPMP EIS

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Table D.3
Major CLRP Projects in the Study Area and its Vicinity

Location	Project ID	Description	Complete Date
Projects Completed by 2013			
1	V12p	Widen I-95 from 6 to 8 lanes from Newington to VA 123	
2	V12ab	Reconstruct I-95/VA 642 interchange	
3	BRAC0004	I-95 DAR Ramps to FBNA	
4	VSF25na	Fairfax Co. Parkway Phase 3	
5	BRAC	Construct interchange at Fairfax Co. Pkwy and Franconia-Springfield Pkwy	
6	BRAC/ VSF25nb	Construct interchange at Fairfax Co. Pkwy and Boudinot Drive	
Projects Completed by 2017			
7	V12r	Construct third I-95/395 HOV lane from 2 mi. N. of I-495 to Prince William Parkway	2015
8	V12r24	I-95 reversible ramps at NB/SB HOV/Bus/HOT lanes and Fairfax Co. Pkwy	2015
9	VSF4c	Widen Telegraph from 2 to 4 lanes from Beulah St. to Leaf Rd. North	2014
10	BRAC	Widen Rolling Rd. NB off-ramp from 2 to 4 (1 to 2?) lanes at Fairfax Co. Parkway	2015
11	FED2	Construct/Widen Old Mill Rd. (Mulligan Rd.) from US 1 to Telegraph Rd.	2014
Projects Completed by 2030			
12	BRAC	Construct I-95 NB off ramp to NB Fairfax Co. Parkway	2020
13	VP1a[1]	Widen US 1 from 4 to 6 lanes from Telegraph to VA 235 South	2020
14	VPu	Widen US 1 from 4 to 6 lanes from VA 235 South to VA 235 North	2025
15	VSF4ca	Widen Telegraph from 2 to 4 lanes from Leaf Road North to Hayfield Road	2025
16	VSF4i	Widen Telegraph from 2 to 4 lanes from Hayfield Road to S. King Hwy.	2025
17	VSF10a	Widen Rolling Rd. from 2 to 4 lanes from Fairfax Co. Pkwy to Old Keene Mill Rd.	2020
18	VSF10c	Widen Pohick Rd. from 2 to 4 lanes from US 1 to I-95	2025
19	VSF26	Construct Franconia-Springfield Pkwy HOV from Fairfax Co. Pkwy to Frontier Drive	2025
20	VSF26a	Construct interchange at Franconia-Springfield Pkwy and Neuman St.	2025
21	VSF26b	Upgrade Franconia-Springfield Pkwy HOV from Rolling Rd. to Backlick Road	2025
Note: (1) The Route 1 widening listed as a 2030 project in the CLRP was included in the 2017 traffic model.			

Post-Processing

Post-processing refers to analytical procedures to adjust the raw outputs that are produced by the travel demand forecasting model to account for model variations. Currently, the guide for post-processing travel demand model forecasts is the National Cooperative Highway Research Program (NCHRP) Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design. Although this report was published in 1982, it is still the current nationally- recognized technical resource for post-processing and was cited in the Federal Highway Administration (FHWA) guidance published in April 2010 on application of travel demand and forecasting for National Environmental Policy Act (NEPA) studies.

Post-processing is necessary because the assignment algorithm in the travel demand forecasting model process is macroscopic. As a result of the travel demand forecasting model network limitations and the macroscopic characteristics of the assignment, certain adjustments may need to be made to the link volumes. The highway network that is used in a travel demand model as a simplified representation of the actual roadway network and does not include all the roads, intersections or access points (e.g., curb cuts, driveways) in the actual roadway system. Therefore, the results that are produced from the assignment need to be adjusted to compensate for these missing roadways and over-assignment to certain links in the model. Post-processing also makes adjustments for capacity limitations which are not fully represented in the model.

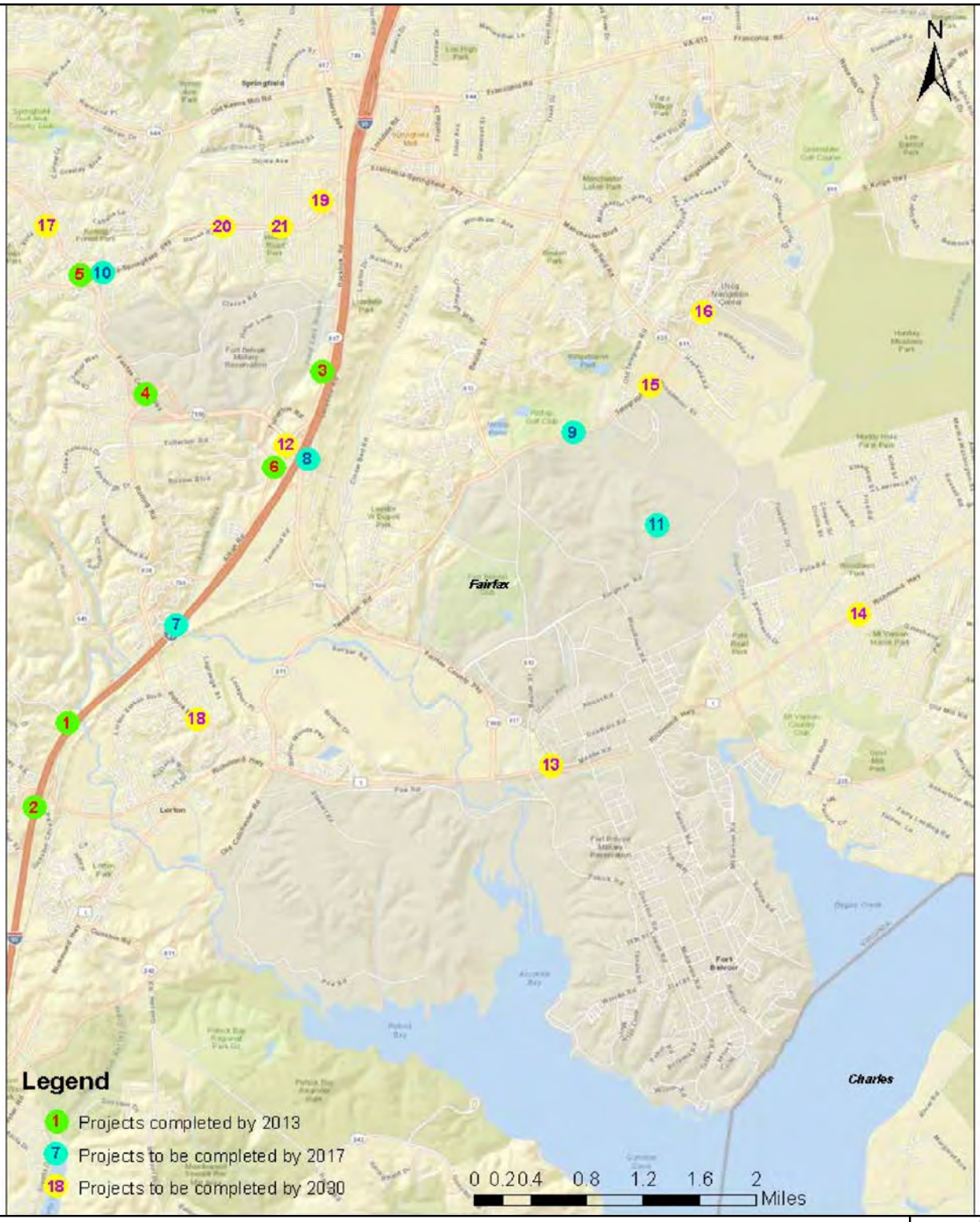
The post-process refinement currently employed in this study applies a set of procedures using spreadsheets as outlined in NCHRP Report 255. The first step is to correct for model bias, based on the differences between the observed count data and the model output for the validation year. The differences in the count and model results are applied to the future-year forecasts in the form of absolute change (delta) and a percentage change (ratios); and the two used in determining adjustments.

Model Validation

Estimated traffic volumes were compared with traffic count data in the study area. This comparison was conducted for all counts in the study area and select cutlines that represent major movements in the study area. Table D.4 shows comparisons of estimated peak hour volumes in the base year 2013 with observed peak hour volumes for 2012/2013 for the gate locations. Major findings after the model validation are as follows:

- Overall, model estimated volumes compared favorably with 2012 daily traffic counts, with a slight overestimation by 2 percent;
- In the study area Fort Belvoir gates, estimated volumes for the AM and PM peak hours from the 2013 model were compared favorably with peak-hour traffic counts conducted in 2012/2013, with a slight overestimation by 6 percent; and

Major CLRP Projects in the Study Area and its Vicinity



Source: US Army, 2014c

Fort Belvoir RPMP EIS

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- In the vicinity area, 2013 model estimated daily volumes were compared favorably with 2012 daily traffic counts, with a slight overestimation by 8 percent.

Table D.4
Comparison of Estimated and Observed Peak Hour Traffic at Gates

	Gate	Entrance Intersection	Total Baseline Entering Volume in AM Peak Hour	Total Baseline Exiting Volume in PM Peak Hour	Total Baseline AM & PM Peak Hour Volume	2013 Model Estimates	Difference
North Post	Kingman*	John J. Kingman Road at Fairfax County Parkway	1782	1582	3364	3043	-10%
	Telegraph	Beulah Street at Telegraph Road	880	805	1685	1313	-22%
	Meeres	Mulligan Road at Pole Road**	0			643	N/A
South Post	Tulley	Pohick Road at US Route 1	1211	801	2012	2597	29%
	Pence	Belvoir Road at US Route 1	869	823	1692	1486	-12%
	Walker	Mount Vernon Road at Mount Vernon Highway	612	600	1212	1055	-13%
Total			5354	4611	9965	10137	2%

Source: Highway Capacity Manual (Transportation Research Board, 2010).
Notes: * Includes movements through DLA East and DLA West Gate
** Open in PM outbound only

D.4.3 Model Application to Public Road Intersections

As indicated in the preceding section, the 2017 Traffic Forecasts were developed using a refined version of the Metropolitan Washington Council of Governments (MWCOG)/National Capitol Transportation Board regional travel demand forecasting model. The outputs of this model provided peak period volumes for links and, at selected locations, individual intersection through and turning movements. Existing volume data were also provided. The differences in the volumes (forecast year to base year) were tabulated as the absolute change (delta) and a percentage change ratios (growth factors).

Two estimates of the 2017 volumes for the individual movements were derived using the forecast data. The first estimate was made by applying the growth factors to the existing volumes for each movement. A second estimate was derived by adding the delta to the existing volume. (Note that in calculating the absolute values (deltas), the model outputs were reduced by 58.3 percent in the AM and 70.6 percent in the PM respectively to convert the model outputs from peak period to peak hour data.) When the volume forecast for an individual movement by the growth factor calculation differed by more than 50 vehicles per hour from the volume resulting from the delta calculations, the average of the two forecasts was used. In cases where one of the forecast volumes did not appear to be reasonable, the forecast volume calculation closest to the existing volume was used.

The estimated 2017 volumes were then rounded using the following conservative rules: volumes under 100 vehicles per hour were rounded down to the preceding multiple of 10 if the one's digit was three or less, and rounded up to the next multiple of ten if the one's digit was greater than 3. Volumes over 100 vehicles per hour were rounded down to the preceding multiple of 25 if the value was less than or equal to the preceding

multiple plus ten, and rounded up to the next multiple of 25 if the value was greater than the preceding multiple plus ten.

The rounded 2017 volumes for the movements at each intersection were then entered into the Synchro signal timing program to calculate the delays and Level of Service (LOS) for that intersection. The base Synchro models for the intersections were taken from the Synchro networks developed by VDOT's Northern Virginia district. The number of lanes for each movement was adjusted as appropriate to reflect capacity increases that would be completed by 2017.

Similar procedures were used for estimating the 2017 volumes at ramps where merge, diverge and weaving takes place. At these locations, the analyses were conducted using the Highway Capacity Software that replicates the procedures contained in the Highway Capacity Manual.

D.4.4 Model Application to Fort Belvoir Intersections

Within the Main Post, the regional model network incorporated selected roads: Kingman, Beulah, Gunston, Belvoir, Pohick and a few other road segments. Growth factors for the road segments were derived from the differences in volumes assigned to the AM and PM time frames for the "Existing," "2017 No-Build," and "2017 Alternative 1" scenarios. Because these growth factors were link-based, rather than the turning movement-based growth factors that were used outside the Main Post, a different procedure was used to generate the 2017 movement volumes for the scenarios.

The 2017 volumes for each movement in a scenario were developed from the existing volumes and the growth factors for the links approaching the intersection and the growth factors for the links departing from the intersection. The first step was to apply the growth factor for each approach link to the movements associated with that link (i.e., the northbound left, through, and right turn volumes were multiplied by the growth factor on the northbound approach link). The second step was to apply the growth factor on the links departing from the intersection to the movements that contribute to that link (i.e., the volumes northbound departure link is comprised of volumes from the northbound through, the westbound right turn, and the eastbound left turn movements). Thus, two new values were obtained for each movement, one based on the growth factor for the approach link, and one based on the growth factor for the departing link. This pair of values for each movement was then averaged to derive the 2017 scenario volume for that movement.

A reasonableness check was performed for growth factors exceeding 100 percent. This check consisted of comparing the new volume based on the growth factor with a new volume based on the absolute growth. If the new volume resulting from the absolute growth was less than the volume resulting from the application of the growth factor, the average of the two values was used in the computation of the new values for that link.

D.4.5 2017 No-Build Level of Service

Delay per vehicle is the major parameter derived by the computations performed by the Synchro program. It is calculated for each individual movement and then summed to provide the average delay for each approach, and for the intersection as a whole. It is measured in seconds per vehicle (sec/veh). The Level of Service (LOS) for the intersection is taken from average value of delay at the intersection and then expressed as a letter value that ranges from A to F. The delay ranges associated with each LOS are shown in Table 3.4-1 in the EIS.

The LOS for the merge, diverge, and weaving areas are based on the space available for vehicles to change lanes within these areas. As the number of vehicles in the area increases, each vehicle's movements become more constrained by the vehicles nearby. The number of vehicles on a section of roadway is expressed in terms of "density" and is measured in vehicles per mile per lane (veh/mi/ln). Table 3.4-1 in the EIS shows the range of densities associated with each LOS in the merge, diverge, and weaving areas.

D.4.6 2017 Build Alternative 1 Level of Service

The enhanced regional demand forecasting model was also modified to reflect the growth on Fort Belvoir associated with Alternative 1, and a series of delta and percent change (growth factor) tables were output by the model reflecting this alternative. These growth factors and delta values were applied to the existing volumes to produce a second set of rounded 2017 volume estimates using the same procedures described in the development of the 2017 No-Build estimates. These 2017 Alternative 1 volume estimates were then used as inputs to the Synchro model or HCM analysis procedures. The results of these analyses are presented in Section 3.4.3.1.

D.4.7 Interpreting Model Outputs

It is important to understand and to view the results of these analyses as indicators rather than absolute predictions of the future conditions.

The enhanced regional travel demand forecasting model is the only reasonable method of estimating a future condition in which there are major changes in the roadway network, the land use, access points to the major interstate highway cutting through the study area, and the opening of a new access control point to the Main Post of Fort Belvoir.

The problems associated with predicting a future that is subject to all of these changes was discussed with the AAG, and the members of this group urged the study team to use the percent change (growth factors) outputs of the model wherever possible and to avoid the use of the "deltas" (the absolute value of the changes) produced by the model.

However, the "Post-Processing" that took place when the model was applied identified many instances when the model predicted a doubling, tripling or order of magnitude increase of the existing volumes. The estimated values were individually reviewed when the estimated volumes resulting from the application of the growth factor was not within 50 vehicles per hour of the volume found by adding the delta to the existing volume. If the two estimates were reasonably close (within a few hundred vehicles of each other), the average of these two estimating procedures was used. If the difference between the estimates was greater, the forecasted volume estimate closest to the original volume was used.

It is also worth noting that the resulting values were rounded in keeping with their nature as estimated values. This tended to eliminate minor differences between values forecast under the different scenarios.

The strength of the modeling procedure and the subsequent post processing is that the same procedures were applied to the individual movements at each intersection under the No-Build and Alternative 1 scenarios. For example, if the estimated volume at a particular left turn movement in the No-Build condition was derived by averaging the values obtained by the growth factor calculation and the delta addition, then the estimated volume for that left turn movement under the Alternative 1 scenario was also determined by averaging the results obtained under the two methods.

In summary, the authors are confident in stating that, except where noted, the differences between the No-Build conditions and Alternative 1 are relatively minor and would be unlikely to be noticed by most observers.

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APPENDIX D

Part II – Transportation Impact Analysis Tables

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2017 Volume Derivations

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FORT BELVOIR TMP TRAFFIC ANALYSIS																	
2017 No-Build AM Traffic Volume Computations				Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)											
1/8/2014						>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)							
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values														
	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
Site																	
28	Franconia Springfld Pkwy		EB Exit Ramp to Rolling Rd	See Merge, Diverage and Weaving Volumes													
29	Franconia Springfld Pkwy		WB On Ramp from Rolling Rd	See Merge, Diverage and Weaving Volumes													
	Franconia Springfld Pkwy		Spring Village Dr														
30	Existing Volumes			30	5	177	76	3	21	57	3587	17	42	937	122		
	17NB-13 AM Pk Prd Delta			3	1	-88	13	0	6	1	380	-1	5	-221	5		
	17NB-13 AM Pk Hr (41.7%)			1	0	-37	6	0	2	0	158	0	2	-92	2		
	17NB-13 AM Grth Fctr (%)			2%	21%	-25%	7%	16%	5%	1%	5%	-1%	3%	-11%	4%		
	2017 NB = Exist x Grth Fctr			31	6	132	81	3	22	58	3760	17	43	830	127		
	Diff check GF- Abs (<50 OK)			0	1	-8	0	0	-1	0	15	0	-1	-15	3		
	NB Rounded Volumes			30	10	125	80	0	20	60	3750	20	40	825	125		
	Franconia Springfld Pkwy		EB Exit & On Ramps at Backlick Rd														
31	Existing Volumes			212	1087	1	1	599	122	1354	1	67	2	1	2		
	17NB-13 AM Pk Prd Delta			261	-334	0	0	-157	82	-810	0	-1	0	0	0		
	17NB-13 AM Pk Hr (41.7%)			109	-139	0	0	-65	34	-338	0	0	0	0	0		
	17NB-13 AM Grth Fctr (%)			37%	-15%	0	0	-8%	14%	-46%	0	-9%	0	0	0		
	2017 NB = Exist x Grth Fctr			291	924	1	1	549	139	733	1	61	2	1	2		
	Difference check (>50)			-30	-23	0	0	15	-18	**-284**	0	-6	0	0	0		
	Average Existing Vol & Numeric Chg =									**1185**							
	NB Rounded Volumes			300	925	0	0	550	150	1175	0	60	0	0	0		
	Franconia Springfld Pkwy		WB Exit & On Ramps at Backlick Rd														
32	Existing Volumes			48	2356	2	9	523	268	159	11	204	3	1	6		
	17NB-13 AM Pk Prd Delta			0	-1144	0	0	8	-84	740	0	-82	0	0	0		
	17NB-13 AM Pk Hr (41.7%)			0	-477	0	0	3	-35	308	0	-34	0	0	0		
	17NB-13 AM Grth Fctr (%)			-14%	-29%	0	0	0%	-10%	219%	0	-11%	0	0	0		
	2017 NB = Exist x Grth Fctr			41	1682	2	9	525	242	507	11	181	3	1	6		
	Difference check (>50 or 50%)			-7	**-197**	0	0	-1	9	40	0	12	0	0	0		
	Average Existing Vol & Numeric Chg =				**2118**					**313**							
	NB Rounded Volumes			40	2125	0	10	525	250	325	10	175	0	0	10		

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
	2017 No-Build AM Traffic Volume Computations			Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)											
	1/8/2014					>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																	
	Franconia Springfld Pkwy		I-95 HOV ramps														
33	Existing Volumes				64	0	125	0	0	0	234	2594	0	3	1398	123	
	17NB-13 AM Pk Prd Delta				0	0	0	0	0	0	0	1460	0	0	530	0	
	17NB-13 AM Pk Hr (41.7%)				0	0	0	0	0	0	0	609	0	0	221	0	
	17NB-13 AM Grth Fctr (%)				0	0	0	0	0	0	0	18%	0	0	22%	0	
	2017 NB = Exist x Grth Fctr				64	0	125	0	0	0	234	3070	0	3	1708	123	
	Difference check (>50 or 50%)				0	0	0	0	**0**	0	**0**	**-132**	**0**	0	**89**	0	
	Use average of Difference and Growth Factors methods											3137			1664		
33	NB Rounded Volumes				**70**	**0**	**125**	**0**	**0**	**0**	**225**	**3150**	**0**	**0**	**1675**	**125**	
	Franconia Springfld Pkwy		EB Exit & On Ramps at Frontier Rd														
34	Existing Volumes				0	235	149	149	515	0	492	0	690	0	0	0	
	17NB-13 AM Pk Prd Delta				0	6	4	120	53	0	-1464	0	54	0	0	0	
	17NB-13 AM Pk Hr (41.7%)				0	3	2	50	22	0	-610	0	22	0	0	0	
	17NB-13 AM Grth Fctr (%)				0	7%	11%	31%	36%	0	-41%	0	45%	0	0	0	
	2017 NB = Exist x Grth Fctr				0	252	166	196	701	0	291	0	998	0	0	0	
	Difference check (>50 or 50%)				0	14	15	-3	**164**	0	**409**	0	**286**	0	0	0	
	Use average of Difference and Growth Factors methods								619				855				
	Average Existing Vol & Grw fctr Chg =										**391**						
	NB Rounded Volumes				**0**	**250**	**175**	**200**	**625**	**0**	**400**	**0**	**850**	**0**	**0**	**0**	
	Franconia Springfld Pkwy		WB Exit & On Ramps at Frontier Rd														
35	Existing Volumes				99	627	0	0	919	162	0	0	0	42	1	725	
	17NB-13 AM Pk Prd Delta				-3	-1455	0	0	152	-282	0	0	0	21	0	919	
	17NB-13 AM Pk Hr (41.7%)				-1	-607	0	0	64	-118	0	0	0	9	0	383	
	17NB-13 AM Grth Fctr (%)				-8%	-40%	0	0	32%	-61%	0	0	0	37%	0	64%	
	2017 NB = Exist x Grth Fctr				91	375	0	0	1214	63	0	0	0	57	1	1186	
	Difference check (>50 or 50%)				-6	**355**	0	0	**232**	19	0	0	0	7	0	**78**	
	Use average of Difference and Growth Factors methods								1098							1147	
	Average Existing Vol & Grw fctr Chg =					501											
	NB Rounded Volumes				**90**	**500**	**0**	**0**	**1100**	**60**	**0**	**0**	**0**	**60**	**0**	**1150**	

FORT BELVOIR TMP TRAFFIC ANALYSIS																
2017 No-Build AM Traffic Volume Computations			Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)										
1/8/2014					>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers		Products are based on mutiplication of actual values													
	Road Name	Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Site															
	Franconia Springfld Pkwy	Beulah St.													
36	Existing Volumes			751	554	81	102	278	244	556	925	485	84	990	173
	17NB-13 AM Pk Prd Delta		Beulah	679	-309	-232	-7	-291	369	327	221	177	-52	454	35
	17NB-13 AM Pk Hr (41.7%)		Beulah	283	-129	-97	-3	-122	154	136	92	74	-22	189	14
	17NB-13 AM Grth Fctr (%)	Franconia Springfield	Beulah	44%	-18%	-16%	-21%	-20%	127%	29%	11%	16%	-26%	27%	40%
	2017 NB = Exist x Grth Fctr			1078	457	68	80	223	553	719	1031	563	62	1256	242
	Difference check (>50 or 50%)			44	32	84	-19	66	155	27	14	4	0	76	54
	Use average of Difference and Growth Factors methods								476					1217	215
	ABSDelt>%Delta	Average Existing Vol & Grw fctr Chg =				75		250							
	NB Rounded Volumes			1075	450	80	80	250	475	725	1025	575	60	1225	225
37	Fairfax Cnty Pky N-S	On Ramp loop frm SB Barta	See Merge, Diverage and Weaving Volumes												
38	Fairfax Cnty Pky SB	SB Exit Ramp at Barta Rd		SEL	SET	SER	NWL	NWT	NWR	~~NEL~~	NET	NER	SWL	SWT	~~SWR~~
			Original Synchro Coc	554	1	381	1	0	1	0	595	4	1	98	0
	Realigned Existing Volumes			1	0	1	554	1	381	0	595	4	1	98	0
	17NB-13 AM Pk Prd Delta			0	0	0	88	0	151	0	-406	0	0	-143	0
	17NB-13 AM Pk Hr (41.7%)			0	0	0	37	0	63	0	-169	0	0	-60	0
	17NB-13 AM Grth Fctr (%)			0	0	0	13%	0	16%	0	-33%	0	0	-56%	0
	2017 NB = Exist x Grth Fctr			1	0	1	627	1	441	0	399	4	1	43	0
	Diff check GF- Abs (<50 OK)			0	0	0	36	0	-3	0	-27	0	0	5	0
	NB Rounded Volumes			0	0	0	625	0	450	0	400	10	0	40	0
38a	Fairfax Cnty Pky SB	Barta Rd Exit Ramp	See Merge, Diverage and Weaving Volumes												
	Fairfax Cnty	NB Exit Ramp at Barta Rd		NWL	NWR	NET	NER	SWL	SWT						
		Original Synchro Coding		96	257	768	0	0	38						
39	Realigned Existing Volumes			96		257					768			38	
	17NB-13 AM Pk Prd Delta			-143	0	0	0	0	0	0	0	0	0	0	1
	17NB-13 AM Pk Hr (41.7%)			-59	0	0	0	0	0	0	0	0	0	0	0
	17NB-13 AM Grth Fctr (%)			-58%	0	-4%	0	0	0	0	0%	0	0	-4%	1%
	2017 NB = Exist x Grth Fctr			40	0	246	0	0	0	0	768	0	0	37	0
	Diff check GF- Abs (<50 OK)			4	0	-11	0	0	0	0	0	0	0	-1	0
	NB Rounded Volumes			40	0	250	0	0	0	0	775	0	0	40	0
39a	Fairfax Cnty Pky NB	Barta Rd On Ramp	See Merge, Diverage and Weaving Volumes												
40	Fairfax Cnty Pky NB	On Ramp loop frm NB Barta Rd	See Merge, Diverage and Weaving Volumes												

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
	2017 No-Build AM Traffic Volume Computations			Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)											
	1/8/2014					>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																	
41	Fairfax Cnty Pky SB		Weaving area - Barta to Boudinot	See Merge, Diverage and Weaving Volumes													
	Backlick Rd N-S		Barta Rd														
42	Existing Vol				197	1211	0	0	378	298	49	0	24	0	0	0	
	17NB-13 AM Pk Prd Delta				-69	-196	0	0	35	-195	19	0	-23	0	0	0	
	17NB-13 AM Pk Hr (41.7%)				-29	-82	0	0	15	-81	8	0	-10	0	0	0	
	17NB-13 AM Grth Fctr (%)				-18%	-8%	0	0	7%	-14%	4%	0	-14%	0	0	0	
	2017 NB = Exist x Grth Fctr				162	1115	0	0	403	257	51	0	21	0	0	0	
	Diff check GF- Abs (<50 OK)				-6	-14	0	0	10	40	-6	0	6	0	0	0	
	NB Rounded Volumes				175	1125	0	0	400	250	50	0	20	0	0	0	
43	I-95 SB HOT Lanes		Merge from North Area On-Ramp	See Merge, Diverage and Weaving Volumes													
44	Fairfax Cnty Pky NB		Weaving area - bet 95 Ramp to Backlick	See Merge, Diverage and Weaving Volumes													
45a	Fairfax Cnty Pky SB		Weaving - 95 SB Exit Ramp to 95 NB Entrance Ramp	See Merge, Diverage and Weaving Volumes													
45b	Fairfax Cnty Pky NB		Weaving - 95 NB Exit Ramp to 95 SB Entrance Ramp	See Merge, Diverage and Weaving Volumes													
	Fairfax Cnty Pky N-S		Loisdale Rd														
46	Existing Vol				0	1570	219	194	1796	546	0	186	382	196	0	683	
	17NB-13 AM Pk Prd Delta				0	-256	-55	221	-288	0	0	-149	258	-31	0	24	
	17NB-13 AM Pk Hr (41.7%)				0	-107	-23	92	-120	0	0	-62	107	-13	0	10	
	17NB-13 AM Grth Fctr (%)				0	-9%	-27%	33%	-6%	0	0	-13%	72%	-34%	0	5%	
	2017 NB w/ Growth fctrs				0	1436	161	258	1693	546	0	162	656	129	0	718	
	Diff check GF- Abs (<50 OK)				0	-27	-36	-28	17	0	0	38	**167**	**-54**	0	25	
	Use average of Difference and growth factors methods												573				
	Use Average of existing and Abs Change values						208							189			
	NB Rounded Volumes				0	1450	200	250	1700	550	0	175	575	200	0	725	

FORT BELVOIR TMP TRAFFIC ANALYSIS																
2017 No-Build AM Traffic Volume Computations			Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)											
1/8/2014					>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers		Products are based on mutiplication of actual values														
	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
Site																
	Fairfax Cnty Pkwy N-S	Terminal Rd														
47	Existing Vol		62	1326	14	63	2606	307	114	4	23	8	7	38		
	17NB-13 AM Pk Prd Delta		9	-319	31	123	-25	-159	8	0	-2	0	0	0		
	17NB-13 AM Pk Hr (41.7%)		4	-133	13	51	-10	-66	3	0	-1	0	0	0		
	17NB-13 AM Grth Fctr (%)		4%	-12%	65%	58%	-1%	-14%	1%	0	-2%	0	0	0		
	2017 NB w/ Growth fctrs		64	1167	23	100	2590	264	116	4	22	8	7	38		
	Diff check GF- Abs (<50 OK)		-1	-26	-4	-15	-5	23	-2	0	0	0	0	0		
	NB Rounded Volumes		70	1175	20	100	2600	275	125	10	20	10	10	40		
	Fairfax Cnty Pkwy N-S	750' south of Terminal Rd														
48	Existing Vol		0	1358	103	174	2413	0	0	0	0	28	0	42		
	17NB-13 AM Pk Prd Delta		0	-292	-40	58	-85	0	0	0	0	-16	0	13		
	17NB-13 AM Pk Hr (41.7%)		0	-122	-17	24	-36	0	0	0	0	-7	0	6		
	17NB-13 AM Grth Fctr (%)		0	-10%	-13%	11%	-2%	0	0	0	0	-39%	0	10%		
	2017 NB w/ Growth fctrs		0	1217	90	193	2357	0	0	0	0	17	0	46		
	Diff check GF- Abs (<50 OK)		0	-19	4	-5	-21	0	0	0	0	-4	0	-1		
	NB Rounded Volumes		0	1225	90	200	2350	0	0	0	0	20	0	50		
	Telegraph Rd E-W	Hayfield Rd														
49	Existing Vol		59	70	35	258	20	373	155	477	15	1	575	52		
	17NB-13 AM Pk Prd Delta		0	-25	-12	2	39	547	820	-44	0	-59	293	-41		
	17NB-13 AM Pk Hr (41.7%)		0	-10	-5	1	16	228	342	-18	0	-25	122	-17		
	2017 NB AM = Exist+Delta		59	60	30	259	36	601	497	459	15	-24	697	35		
	17NB-13 AM Grth Fctr (%)		0	-7%	-8%	17%	32%	0	1297%	-3%	0	-43%	28%	-85%		
	2017 NB w/ Growth fctrs		59	65	32	302	26	373	2165	462	15	1	736	8		
	Difference check (>50)		0	6	2	43	-10	-228	1668	4	0	24	38	-27		
	Add Abs values to Existing Volumes							601	497							
	NB Rounded Volumes		60	70	30	300	30	600	500	475	20	0	750	10		
50	Telegraph Rd E-W	Mulligan Rd	esized East West volumes based on Telegraph at DCEETA													
	Existing Vol		0	0	0	0	0	0	0	970	0	0	687	0		
	17NB-13 AM Pk Prd Delta		1062	0	1027	0	0	0	0	-229	859	985	-104	0		
	17NB-13 AM Pk Hr (41.7%)		443	0	428	0	0	0	0	-95	358	411	-43	0		
	17NB-13 AM Grth Fctr (%)		0	0	0	0	0	0	0	-15%	0	0	-9%	0		
	2017 NB w/ Growth fctrs		0	0	0	0	0	0	0	827	0	0	627	0		
	Difference check (>50)		-443	0	-428	0	0	0	0	-48	-358	-411	-17	0		
	New Vols used for Mulligan Vols		443		428						358	411				
	NB Rounded Volumes		450	0	425	0	0	0	0	825	350	425	625	0		

FORT BELVOIR TMP TRAFFIC ANALYSIS																		
	2017 No-Build AM Traffic Volume Computations					**Rounding Rules:**		**"1 to 99 Rnd to 10x (up if >d3)**										
	1/8/2014							**>100 Rnd to 25x (up if >25+10)**				**>100 Rnd to 25x (down if<25+11)**						
	Actual values are displayed as whole numbers				**Products are based on mutiplication of actual values**													
	Road Name			**Road Name**		**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Site																		
	Telegraph Rd E-W			**Road B (DCEETA)**														
51	**Existing Vol**					**35**	**0**	**4**	**1**	**0**	**1**	**19**	**965**	**228**	**50**	**635**	**2**
	17NB-13 AM Pk Prd Delta					1	0	17	0	0	0	0	613	-88	97	861	0
	17NB-13 AM Pk Hr (41.7%)					0	0	7	0	0	0	0	256	-37	40	359	0
	2017 NB AM = Exist+Delta					35	0	11	1	0	1	19	1221	191	90	994	2
	17NB-13 AM Grth Fctr (%)					0%	0	29%	0	0	0	0	41%	-12%	55%	84%	0
	2017 NB w/ Growth fctrs					35	0	5	1	0	1	19	1362	201	78	1172	2
	Difference check (>50)					0	0	-6	0	0	0	0	**141**	10	-13	**178**	0
	Use average of Difference and growth factors methods												1291			1083	
	NB Rounded Volumes					**40**	**0**	**10**	**0**	**0**	**0**	**20**	**1300**	**200**	**80**	**1075**	**0**
	Telegraph Rd E-W			**Beulah St**														
52	**Existing Vol**					**6**	**85**	**29**	**180**	**480**	**220**	**406**	**829**	**203**	**197**	**298**	**91**
	17NB-13 AM Pk Prd Delta					-4	105	-62	447	-242	-436	-595	141	49	-24	30	856
	17NB-13 AM Pk Hr (41.7%)					-2	44	-26	186	-101	-182	-248	59	20	-10	13	357
	17NB-13 AM Grth Fctr (%)					-96%	22%	-64%	135%	-21%	-32%	-27%	8%	0	-8%	4%	1112%
	2017 NB w/ Growth fctrs					0	104	11	424	378	149	298	894	203	181	309	1103
	Difference check (>50)					-4	-25	8	**58**	-1	**110**	**140**	6	-20	-6	-1	**655**
	Use average of Difference and growth factors methods								395								
	Use Average of existing and Abs Change values																269
	ABSDelt>%Delta			Average Exist & Exist*Delta%							184	352					
	NB Rounded Volumes					**0**	**100**	**10**	**400**	**375**	**175**	**350**	**900**	**200**	**175**	**300**	**275**
	Telegraph Rd			**Newington Rd**														
				Original Coding from Synchro		0	0	0	94	0	10	71	1198	0	3	438	91
53	**Existing Vol**			**Telegraph N-S Revised coding to match model**		**71**	**1198**	**0**	**3**	**438**	**91**	**94**	**0**	**10**	**0**	**0**	**0**
	17NB-13 AM Pk Prd Delta					0	-709	0	0	-356	-54	304	0	-110	0	0	0
	17NB-13 AM Pk Hr (41.7%)					0	-296	0	0	-149	-22	127	0	-46	0	0	0
	17NB-13 AM Grth Fctr (%)					-2%	-19%	0	0	-23%	-9%	87%	0	-60%	0	0	0
	2017 NB w/ Growth fctrs					69	968	0	3	338	83	176	0	4	0	0	0
	Difference check (>50)					-2	**66**	0	0	48	14	-45	0	40	0	0	0
	Use average of Difference and growth factors methods											199		-16			
	ABSDelt>%Delta			Average Exist & Exist*Delta%			1083										
	Retain Existing Value													10			
	NB Rounded Volumes					**70**	**1075**	**0**	**0**	**350**	**80**	**200**	**0**	**10**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
	2017 No-Build AM Traffic Volume Computations				Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)										
	1/8/2014						>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																	
	Fairfax Cnty Pkwy SB Ramps		Telegraph Rd (S)														
54	Existing Vol				0	0	0	132	1	160	0	1203	298	110	252	0	
	17NB-13 AM Pk Prd Delta				0	0	0	27	0	15	0	-414	-461	-570	49	0	
	17NB-13 AM Pk Hr (41.7%)				0	0	0	11	0	6	0	-173	-192	-238	21	0	
	17NB-13 AM Grth Fctr (%)				0	0	0	121%	0	14%	0	-10%	-36%	-81%	5%	0	
	2017 NB w/ Growth fctrs				0	0	0	292	1	182	0	1082	191	21	265	0	
	Difference check (>50)				0	0	0	**148**	0	16	0	**51**	**85**	**149**	-8	0	
	Use average of Difference and growth factors methods							217									
	ABSDelt>%Delt	Average Exist & Exist*Delta%										1142	244	66			
	NB Rounded Volumes				0	0	0	225	0	175	0	1150	250	70	275	0	
54a	Fairfax Cnty Pky SB		Exit Ramp to Telegraph Rd	See Merge, Diverage and Weaving Volumes													
54b	Fairfax Cnty Pky SB		On Ramp from Telegraph Rd	See Merge, Diverage and Weaving Volumes													
	Fairfax Cnty Pkwy NB Ramps		Telegraph Rd (N)														
55	Existing Vol				19	1	131	0	0	0	390	989	0	0	348	201	
	17NB-13 AM Pk Prd Delta				-27	0	-195	0	0	0	158	-545	0	0	-493	63	
	17NB-13 AM Pk Hr (41.7%)				-11	0	-81	0	0	0	66	-227	0	0	-206	26	
	17NB-13 AM Grth Fctr (%)				-54%	0	-84%	0	0	0	31%	-15%	0	0	-31%	27%	
	2017 NB w/ Growth fctrs				9	1	21	0	0	0	511	840	0	0	242	256	
	Difference check (>50)				1	0	-28	0	0	0	**55**	**79**	0	0	**99**	29	
	Use average of Difference and growth factors methods										**483**						
	ABSDelt>%Delt	Average Exist & Exist*Delta%										915			295		
	NB Rounded Volumes				10	0	20	0	0	0	475	925	0	0	300	250	
55a	Fairfax Cnty Pky NB		On Ramp from Telegraph Rd	See Merge, Diverage and Weaving Volumes													
55b	Fairfax Cnty Pky NB		Exit Ramp to Telegraph Rd	See Merge, Diverage and Weaving Volumes													
56	Fairfax Cnty Pky NB - SB		Ehlers Rd	Synthesize from Kingman - No Signal													
	Existing Vol				0	0	0	0	0	0	0	2361	0	0	1005		
	17NB-13 AM Pk Prd Delta				0	0	0	0	0	0	0	-1173	0	0	-776	0	
	17NB-13 AM Pk Hr (41.7%)				0	0	0	0	0	0	0	-489	0	0	-324	0	
	17NB-13 AM Grth Fctr (%)				0	0	0	0	0	0	0	-21%	0	0	-29%	0	
	2017 NB w/ Growth fctrs				0	0	0	0	0	0	0	1862	0	0	713	0	
	Difference check (>50)				0	0	0	0	0	0	0	-10	0	0	32	0	
	NB Rounded Volumes				0	0	0	0	0	0	0	1875	0	0	725	0	

FORT BELVOIR TMP TRAFFIC ANALYSIS																
2017 No-Build AM Traffic Volume Computations			Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)											
1/8/2014					>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Site																
57	Fairfax Cnty Pky NB - SB		Kingman Rd													
	Existing Vol			**6**	**844**	**426**	**1350**	**984**	**27**	**3**	**6**	**4**	**39**	**3**	**158**
	17NB-13 AM Pk Prd Delta			13	-801	-298	358	-1512	-19	4	2	-5	-219	0	21
	17NB-13 AM Pk Hr (41.7%)			5	-334	-124	149	-631	-8	2	1	-2	-91	0	9
	17NB-13 AM Grth Fctr (%)			19%	-34%	-87%	12%	-75%	-4%	7%	25%	-8%	-68%	-3%	7%
	2017 NB w/ Growth fctrs			7	554	57	1508	242	26	3	8	4	12	3	170
	Difference check (>50)			-4	44	**-245**	8	**-111**	7	-2	1	2	**65**	0	3
	ABSDelt>%Delt	Average Exist & Exist*Delta%			699								26		
	ABSDelt<%Delt	Average Exist & (Exist+Delta)				364		669							
	NB Rounded Volumes			**10**	**700**	**375**	**1500**	**675**	**30**	**0**	**10**	**10**	**30**	**0**	**175**
	I-95 Ramps		**Lorton Rd (W)**												
58	**Existing Vol**			**3**	**0**	**4**	**89**	**0**	**67**	**143**	**1750**	**12**	**8**	**409**	**136**
	17NB-13 AM Pk Prd Delta			0	0	0	18	0	47	0	1299	-58	217	405	0
	17NB-13 AM Pk Hr (41.7%)			0	0	0	7	0	20	0	542	-24	90	169	0
	17NB-13 AM Grth Fctr (%)			0	0	0	4%	0	9%	0	29%	-8%	135%	54%	0
	17NB-13-AM Pk Hr (41.7%)		Corrected Column Placement	0	0	0	7	0	20	-24	542	0	0	169	90
	17NB-13-AM%		Corrected Column Placement	0	0	0	4%	0%	9%	-8%	29%	0	0	54%	135%
	2017 NB w/ Growth fctrs			3	0	4	93	0	73	131	2258	12	8	628	320
	Difference check (>50)			0	0	0	-3	0	-14	12	-34	0	0	50	**93**
		Use average of Difference and growth factors methods													**273**
	NB Rounded Volumes			**0**	**0**	**10**	**90**	**0**	**70**	**125**	**2250**	**10**	**10**	**625**	**275**
	I-95 Ramps		**Lorton Rd (E)**												
59	**Existing Vol**			**6**	**17**	**10**	**191**	**26**	**34**	**798**	**998**	**37**	**28**	**508**	**422**
	17NB-13 AM Pk Prd Delta			0	0	0	166	0	141	0	911	405	176	480	0
	17NB-13 AM Pk Hr (41.7%)			0	0	0	69	0	59	0	380	169	73	200	0
	17NB-13 AM Grth Fctr (%)			0	0	0	9%	0	115%	0	30%	22%	60%	61%	0
	17NB-13-AM Pk Hr (41.7%)		Corrected Column Placement	0	0	0	69	0	59	169	380	0	0	200	73
	17NB-13-AM%		Corrected Column Placement	0%	0%	0%	9%	0%	115%	22%	30%	0	0	61%	60%
	2017 NB w/ Growth fctrs			6	17	10	209	26	73	971	1301	37	28	816	675
	Difference check (>50)			0	0	0	**-51**	0	-20	4	**-77**	0	0	**108**	**180**
		Use average of Difference and growth factors methods					**235**				**1339**			**762**	**585**
	NB Rounded Volumes			**10**	**20**	**10**	**225**	**30**	**70**	**975**	**1350**	**40**	**30**	**775**	**575**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
2017 No-Build AM Traffic Volume Computations					Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)										
1/8/2014							>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers				Products are based on mutiplication of actual values													
	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																	
	Route 1		Lorton Rd (T int)														
60	Existing Vol		Route 1 coded as N-S		3	2503	0	7	562	145	737	0	15	0	0	0	
	17NB-13 AM Pk Prd Delta				-6	-668	0	0	-208	499	1115	0	-11	0	0	0	
	17NB-13 AM Pk Hr (41.7%)				-2	-279	0	0	-87	208	465	0	-5	0	0	0	
	17NB-13 AM Grth Fctr (%)				-8%	-14%	0	0	-10%	112%	42%	0	-12%	0	0	0	
	2017 NB w/ Growth fctrs				3	2154	0	7	506	307	1045	0	13	0	0	0	
	Difference check (>50)				2	**-70**	0	0	31	-46	**-157**	0	3	0	0	0	
	ABSDelt>%Delt	Average Exist & Exist*Delta%				2329											
	Use average of Difference and growth factors methods										**1123**						
	NB Rounded Volumes				**0**	**2325**	**0**	**10**	**500**	**300**	**1125**	**0**	**10**	**0**	**0**	**0**	
	Route 1		Pohick Rd (T int.)														
61	Existing Vol		Route 1 coded as E-W		1	0	2	335	1	86	134	3187	1	1	612	103	
	17NB-13 AM Pk Prd Delta				0	0	0	155	0	16	-32	452	0	0	232	12	
	17NB-13 AM Pk Hr (41.7%)				0	0	0	65	0	7	-13	188	0	0	97	5	
	17NB-13 AM Grth Fctr (%)				0	0	0	11%	0	13%	-15%	6%	0	0	10%	13%	
	2017 NB w/ Growth fctrs				1	0	2	373	1	97	114	3383	1	1	670	116	
	Diff check GF- Abs (<50 OK)				0	0	0	-27	0	4	-7	8	0	0	-38	8	
	NB Rounded Volumes				**0**	**0**	**0**	**375**	**0**	**100**	**125**	**3375**	**0**	**0**	**675**	**125**	
	Route 1		Telegraph Rd														
62	Existing Vol		Route 1 coded as E-W		9	156	191	41	16	194	1094	2390	12	12	502	98	
	17NB-13 AM Pk Prd Delta				2	-199	111	59	4	97	-681	1288	0	-4	145	35	
	17NB-13 AM Pk Hr (41.7%)				1	-83	46	24	2	40	-284	537	0	-2	60	14	
	17NB-13 AM Grth Fctr (%)				968%	-19%	12%	0	19%	13%	-17%	28%	0	-15%	8%	0	
	2017 NB w/ Growth fctrs				96	126	214	41	19	219	913	3060	12	10	543	98	
	Difference check (>50)				**86**	**53**	-23	-24	1	-16	**103**	**133**	0	0	-19	-14	
	Use average of Difference and growth factors methods				53							2994					
	ABSDelt>%Delt	Average Exist & Exist*Delta%				141					1003						
	NB Rounded Volumes				**50**	**150**	**225**	**40**	**20**	**225**	**1000**	**3000**	**10**	**10**	**550**	**100**	

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
	2017 No-Build AM Traffic Volume Computations			Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)											
	1/8/2014					>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																	
	Fairfax County Pkwy		Route 1														
63	Existing Vol		Route 1 coded as E-W		0	0	0	833	0	22	394	2073	0	0	569	921	
	17NB-13 AM Pk Prd Delta				0	0	0	-1672	0	-64	56	1402	0	0	240	-1142	
	17NB-13 AM Pk Hr (41.7%)				0	0	0	-697	0	-27	23	585	0	0	100	-476	
	17NB-13 AM Grth Fctr (%)				0	0	0	-76%	0	-35%	6198%	25%	0	0	15%	-42%	
	2017 NB w/ Growth fctrs				0	0	0	200	0	14	24813	2600	0	0	654	537	
	Difference check (>50)				0	0	0	**65**	0	19	**24396**	**-58**	0	0	-15	**92**	
	Average of existing and Approach growth volumes							517				2336				729	
	Use Absolute growth										417						
	NB Rounded Volumes				0	0	0	525	0	20	425	2350	0	0	650	725	
	Route 1		Pohick Rd (Tulley Gate)														
64	Existing Vol		Route 1 coded as E-W		147	7	10	102	64	6	5	1838	1047	93	1363	34	
	17NB-13 AM Pk Prd Delta				-166	0	0	0	0	0	0	831	-1101	0	-735	0	
	17NB-13 AM Pk Hr (41.7%)				-69	0	0	0	0	0	0	347	-459	0	-307	0	
	17NB-13 AM Grth Fctr (%)				-22%	0	6%	0	0	0	0	18%	-37%	6%	-21%	0	
	2017 NB w/ Growth fctrs				115	7	11	102	64	6	5	2162	664	99	1082	34	
	Difference check (>50)				38	0	0	0	0	0	0	-22	**76**	5	26	0	
	ABSDelt>%Delt	Average Exist & Exist*Delta%											855		1223		
	NB Rounded Volumes				125	10	10	100	70	10	10	2175	850	100	1225	40	
	Route 1 at Belvoir Rd		Original Synchro Coding US 1 N-S		0	1460	532	337	1357	0	0	0	0	104	0	130	
65	Existing Vol		Revised Cding to match mdl US 1 E-W		104	0	130	0	0	0	0	1460	532	337	1357	0	
	17NB-13 AM Pk Prd Delta		Route 1	Belvoir	-145	46	-87	508	13	77	330	623	-121	-337	-667	1544	
	17NB-13 AM Pk Hr (41.7%)		Route 1	Belvoir	-60	19	-36	212	5	32	138	260	-50	-140	-278	644	
	17NB-13 AM Grth Fctr (%)		Route 1	Belvoir	-43%	0	-19%	0	0	0	0	14%	-30%	-26%	-21%	0	
	2017 NB w/ Growth fctrs				59	0	106	0	0	0	0	1671	373	249	1078	0	
	Difference check (>50)				15	-19	12	-212	-5	-32	-138	-49	**-109**	**53**	-1	-644	
	New Vols used for Lieber Gate Vols					19		212	5	32	138					644	
	ABSDelt<%Delt	Average Exist & (Exist+Delta)											507	267			
	NB Rounded Volumes				60	20	100	225	10	30	150	1675	500	275	1075	650	

FORT BELVOIR TMP TRAFFIC ANALYSIS																
2017 No-Build AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)												
1/8/2014				>100 Rnd to 25x (up if >25+10)						>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																
66	Route 1 at Woodlawn Rd		Original Synchro Coding US 1 N-S	6	1451	0	0	1737	1	1	0	1	0	0	0	
	Existing Vol		Revised Coding to match model US 1 E-W	**0**	**0**	**0**	**1**	**0**	**1**	**6**	**1451**	**0**	**0**	**1737**	**1**	
	17NB-13 AM Pk Prd Delta			0	0	0	0	0	0	0	1043	0	0	541	0	
	17NB-13 AM Pk Hr (41.7%)			0	0	0	0	0	0	0	435	0	0	226	0	
	17NB-13 AM Grth Fctr (%)			0	0	0	0	0	0	0	22%	0	0	12%	0	
	2017 NB w/ Growth fctrs		(existing vols used for GF=0)	0	0	0	1	0	1	6	1767	0	0	1944	1	
	Difference check (>50)			0	0	0	0	0	0	0	**-119**	0	0	-18	0	
	Use average of Difference and growth factors methods										1827					
	NB Rounded Volumes			**0**	**0**	**0**	**0**	**0**	**0**	**10**	**1825**	**0**	**0**	**1950**	**0**	
67	Mulligan Rd		Pole Rd													
	Existing Vol (No Signal)		Synthesized Vols frm Rt1 Vols	**0**	**0**	**133**	**0**	**0**	**0**	**0**	**0**	**0**	**256**	**0**	**0**	
	17NB-13 AM Pk Prd Delta			0	1392	134	659	1185	0	0	0	0	23	0	697	
	17NB-13 AM Pk Hr (41.7%)			0	581	56	275	494	0	0	0	0	10	0	290	
	17NB-13 AM Grth Fctr (%)			0		308%			0				19%	0		
	2017 NB w/ Growth fctrs					543							304			
	Difference check (>50)			0		355							38			
	Use average of Difference and growth factors methods					366										
	New Vols used for new Movements				581		275	494							290	
	NB Rounded Volumes			**0**	**575**	**375**	**275**	**500**	**0**	**0**	**0**	**0**	**300**	**0**	**300**	
68	US Route 1		Mulligan Rd													
	Existing Vol			**323**	**21**	**32**	**32**	**73**	**151**	**100**	**1021**	**333**	**111**	**1220**	**12**	
	17NB-13 AM Pk Prd Delta			40	637	-221	133	372	214	35	713	295	-387	287	337	
	17NB-13 AM Pk Hr (41.7%)			17	266	-92	56	155	89	15	297	123	-161	120	141	
	17NB-13 AM Grth Fctr (%)			6%	1045%	-74%	0	493%	31%	8%	20%	37%	-54%	9%	0	
	2017 NB w/ Growth fctrs		(existing vols used for GF=0)	343	241	8	32	433	198	108	1227	457	51	1329	12	
	Difference check (>50)			4	-46	**68**	**-56**	**205**	-42	-7	**-92**	1	**102**	-10	**-141**	
	Use average of Difference and growth factors methods				264		60	331	219		1272					
	Use Existing Volumes					32										
	ABSDelt>%Delta		Average Exist & Exist*Delta%										81		82	
	NB Rounded Volumes			**350**	**275**	**30**	**60**	**325**	**225**	**100**	**1275**	**450**	**80**	**1325**	**80**	

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
2017 No-Build AM Traffic Volume Computations					Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)										
1/8/2014							>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers				Products are based on mutiplication of actual values													
Road Name			Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Site																	
69 Mount Vernon Highway			Mount Vernon Rd														
Existing Vol					380	410	0	0	333	232	52	0	137	0	0	0	
17NB-13 AM Pk Prd Delta					-95	437	0	0	437	-228	-31	0	-30	0	0	0	
17NB-13 AM Pk Hr (41.7%)					-40	182	0	0	182	-95	-13	0	-13	0	0	0	
17NB-13 AM Grth Fctr (%)					-28%	74%	0	0	66%	-29%	-10%	0	-8%	0	0	0	
2017 NB w/ Growth fctrs			(existing vols used for GF=0)		274	714	0	0	552	164	47	0	126	0	0	0	
Difference check (>50)					**-66**	**122**	0	0	36	27	8	0	2	0	0	0	
Use average of Difference and growth factors methods						653											
ABSDelt<%Delta			Average Exist & (Exist+Delta)		360												
NB Rounded Volumes					350	650	0	0	550	175	50	0	125	0	0	0	

FORT BELVOIR TMP TRAFFIC ANALYSIS														
	2017 Alt 1 AM Traffic Volume Computations		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)										
	12/24/2013			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
28	Franconia Springfld Pkwy	EB Exit Ramp to Rolling Rd	See Merge, Diverage and Weaving Volumes											
29	Franconia Springfld Pkwy	WB On Ramp from Rolling Rd	See Merge, Diverage and Weaving Volumes											
	Franconia Springfld Pkwy	Spring Village Dr												
30	Existing Volumes		30	5	177	76	3	21	57	3587	17	42	937	122
	17Alt1-13-AM Pk Hr (41.7%)		1	0	-34	6	0	3	1	147	-1	2	-85	2
	17Alt1-13-AM Grth Fctr %		2%	21%	-23%	7%	16%	6%	1%	4%	-1%	3%	-10%	4%
	2017 Alt 1 w/ Growth fctrs		30	6	136	81	3	22	58	3748	17	43	839	127
	Diff check GF- Abs (<50 OK)		0	1	-7	0	0	-1	0	14	0	0	-14	3
	Alt1 Rounded Volumes		30	10	150	80	0	20	60	3750	20	40	850	125
	Franconia Springfld Pkwy	EB Exit & On Ramps at Backlick Rd												
31	Existing Volumes		212	1087	1	1	599	122	1354	1	67	2	1	2
	17Alt1-13-AM Pk Hr (41.7%)		122	-158	0	0	-79	25	-356	0	0	0	0	0
	17Alt1-13-AM Grth Fctr %		42%	-17%			-10%	10%	-48%		-9%			
	2017 Alt 1 w/ Growth fctrs		301	902	0	0	538	134	700	0	61	0	0	0
	Diff check GF- Abs (<50 OK)		-34	-27	0	0	18	-13	**-298**	0	-5	0	0	0
	Average Existing & (Exist-Delta)								**1176**					
	Rounded Volumes		300	900	0	0	550	125	1175	0	60	0	0	0
	Franconia Springfld Pkwy	WB Exit & On Ramps at Backlick Rd												
32	Existing Volumes		48	2356	2	9	523	268	159	11	204	3	1	6
	17Alt1-13-AM Pk Hr (41.7%)		0	-514	0	0	-16	-22	366	0	-38	0	0	0
	17Alt1-13-AM Grth Fctr %		-14%	-31%		0%	-2%	-6%	**260%**	0%	-12%	0%	0%	0%
	2017 Alt 1 w/ Growth fctrs		41	1629	0	9	512	252	573	11	179	3	1	6
	Diff check GF- Abs (<50 OK)		-7	**-213**	-2	0	4	6	48	0	13	0	0	0
	Average Existing & (Exist-Delta)			**2099**					**342**					
	Rounded Volumes		40	2100	0	10	525	250	350	10	175	0	0	10

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
	2017 Alt 1 AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)												
	12/24/2013				>100 Rnd to 25x (up if >25+10)						>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
	Franconia Springfld Pkwy		I-95 HOV ramps														
33	Existing Volumes			64	0	125	0	0	0	234	2594	0	3	1398	123		
	17Alt1-13-AM	Pk Hr (41.7%)		0	0	0	0	0	0	0	622	0	0	270	0		
	17Alt1-13-AM Grth Fctr %			0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	27%	0%		
	2017 Alt 1 w/ Growth fctrs			64	0	125	0	0	0	234	3081	0	3	1777	123		
	Diff check GF- Abs (<50 OK)			0	**0**	0	0	0	0	0	-135	0	0	109	0		
	Use average of Difference and Growth Factors methods										3149			1723			
	Rounded Volumes			**70**	**0**	**125**	**0**	**0**	**0**	**225**	**3150**	**0**	**0**	**1725**	**125**		
	Franconia Springfld Pkwy		EB Exit & On Ramps at Frontier Rd														
34	Existing Volumes			**0**	**235**	**149**	**149**	**515**	**0**	**492**	**0**	**690**	**0**	**0**	**0**		
	17Alt1-13-AM	Pk Hr (41.7%)		0	4	2	105	23	0	**-604**	0	30	0	0	0		
	17Alt1-13-AM Grth Fctr %			0%	11%	16%	65%	38%	0%	-40%	0%	60%	0%	0%	0%		
	2017 Alt 1 w/ Growth fctrs			0	260	172	247	708	0	293	0	1101	0	0	0		
	Diff check GF- Abs (<50 OK)			0	22	21	-7	**170**	0	**405**	0	**381**	0	0	0		
	Use average of Difference and Growth Factors methods							623				911					
	ABSDelt>%Delta		Average Exist & Exist*Delta%							392							
	Rounded Volumes		***Updated 12/9/13***	**0**	***250***	***175***	**250**	**625**	**0**	**400**	**0**	**925**	**0**	**0**	**0**		
	Franconia Springfld Pkwy		WB Exit & On Ramps at Frontier Rd														
35	Existing Volumes			**99**	**627**	**0**	**0**	**919**	**162**	**0**	**0**	**0**	**42**	**1**	**725**		
	17Alt1-13-AM	Pk Hr (41.7%)	Franconia Springf WB Exit to Frontie	-1	-599	0	0	118	-117	0	0	0	10	0	384		
	17Alt1-13-AM Grth Fctr %		Franconia Springf WB Exit to Frontie	-5%	-40%	0%	0%	60%	-61%	0%	0%	0%	41%	0%	64%		
	2017 Alt 1 w/ Growth fctrs			94	378	0	0	1468	63	0	0	0	59	1	1187		
	Diff check GF- Abs (<50 OK)			-4	**351**	0	0	**431**	19	0	0	0	8	0	**78**		
	Use average of Difference and Growth Factors methods							1252							1148		
	ABSDelt>%Delta		Average Exist & Exist*Delta%		503												
	Rounded Volumes			**100**	**500**	**0**	**0**	**1250**	**60**	**0**	**0**	**0**	**60**	**0**	**1150**		

FORT BELVOIR TMP TRAFFIC ANALYSIS														
	2017 Alt 1 AM Traffic Volume Computations		**Rounding Rules:**	**"1 to 99 Rnd to 10x (up if >d3)**										
	12/24/2013			**>100 Rnd to 25x (up if >25+10)**			**>100 Rnd to 25x (down if<25+11)**							
	Actual values are displayed as whole numbers		**Products are based on mutiplication of actual values**											
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
	Franconia Springfld Pkwy	**Beulah St.**												
36	**Existing Volumes**		**751**	**554**	**81**	**102**	**278**	**244**	**556**	**925**	**485**	**84**	**990**	**173**
	17Alt1-13-AM Pk Hr (41.7%)		290	-121	-135	-3	-82	128	133	139	125	-19	198	14
	17Alt1-13-AM Grth Fctr %		45%	-16%	-22%	-22%	-13%	106%	29%	17%	27%	-23%	28%	38%
	2017 Alt 1 w/ Growth fctrs		1087	463	63	80	241	502	716	1084	617	65	1268	239
	Diff check GF- Abs (<50 OK)		45	30	**117**	-19	44	**129**	26	21	7	0	**80**	**52**
	Use average of Difference and Growth Factors methods							437					1228	213
	ABSDelt>%Delta	Average Exist & Exist*Delta%			**72**									
	Rounded Volumes		**1100**	**475**	**70**	**80**	**250**	**450**	**725**	**1075**	**625**	**70**	**1225**	**225**
37	**Fairfax Cnty Pky N-S**	**On Ramp loop frm SB Barta**		**See Merge, Diverage and Weaving Volumes**										
38	**Fairfax Cnty Pky SB**	**SB Exit Ramp at Barta Rd**	SEL	SET	SER	NWL	NWT	NWR	~~NEL~~	NET	NER	SWL	SWT	~~SWR~~
		Original Synchro C	554	1	381	1	0	1	0	595	4	1	98	0
	Realigned Existing Volumes		**1**	**0**	**1**	**554**	**1**	**381**	**0**	**595**	**4**	**1**	**98**	**0**
	17Alt1-13-AM Pk Hr (41.7%)		0	0	0	41	0	64	0	-164	0	0	-59	0
	17Alt1-13-AM Grth Fctr %		0%	0%	0%	15%	0%	16%	0%	-32%	0%	0%	-55%	0%
	2017 Alt 1 w/ Growth fctrs		1	0	1	636	1	441	0	404	4	1	44	0
	Diff check GF- Abs (<50 OK)		0	0	0	40	0	-3	0	-26	0	0	4	0
	Rounded Volumes		0	0	0	650	0	450	0	400	10	0	50	0
38a	**Fairfax Cnty Pky SB**	**Barta Rd Exit Ramp**		**See Merge, Diverage and Weaving Volumes**										
	Fairfax Cnty Pky NB	**NB Exit Ramp at Barta Rd**	NWL	NWR	NET	NER	SWL	SWT						
		Original Synchro Coding	**96**	**257**	**768**	**0**	**0**	**38**						
39	**Realigned Existing Volumes**		**96**		**257**					**768**			**38**	
	17Alt1-13-AM Pk Hr (41.7%)		-59	0	0	0	0	0	0	1	0	0	0	0
	17Alt1-13-AM Grth Fctr %		-57%	0%	-4%	0%	0%	0%	0%	0%	0%	0%	-4%	1%
	2017 Alt 1 w/ Growth fctrs		41	0	246	0	0	0	0	770	0	0	37	0
	Diff check GF- Abs (<50 OK)		4	0	-11	0	0	0	0	1	0	0	-1	0
	Rounded Volumes		**40**	**0**	**250**	**0**	**0**	**0**	**0**	**775**	**0**	**0**	**40**	**0**
39a	**Fairfax Cnty Pky NB**	**Barta Rd On Ramp**		**See Merge, Diverage and Weaving Volumes**										

FORT BELVOIR TMP TRAFFIC ANALYSIS														
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	12/24/2013			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
40	Fairfax Cnty Pky NB	On Ramp loop frm NB Barta Rd	See Merge, Diverage and Weaving Volumes											
41	Fairfax Cnty Pky SB	Weaving area - Barta to Boudinot	See Merge, Diverage and Weaving Volumes											
	Backlick Rd N-S	Barta Rd												
42	Existing Vol		197	1211	0	0	378	298	49	0	24	0	0	0
	17Alt1-13-AM Pk Hr (41.7%)		-35	-84	0	0	13	-93	7	0	-9	0	0	0
	17Alt1-13-AM Grth Fctr %		-21%	-8%	0%	0%	6%	-16%	4%	0%	-13%	0%	0%	0%
	2017 Alt 1 w/ Growth fctrs		155	1112	0	0	400	251	51	0	21	0	0	0
	Diff check GF- Abs (<50 OK)		-7	-15	0	0	9	46	-6	0	6	0	0	0
	Rounded Volumes		150	1125	0	0	400	250	50	0	20	0	0	0
43	I-95 SB HOT Lanes	Merge from North Area On-Ramp	See Merge, Diverage and Weaving Volumes											
44	Fairfax Cnty Pky NB	Weaving area - bet 95 Ramp to Boudinot	See Merge, Diverage and Weaving Volumes											
45a	Fairfax Cnty Pky SB	Weaving - 95 SB Exit Ramp to 95 NB On Ramp	See Merge, Diverage and Weaving Volumes											
45b	Fairfax Cnty Pky NB	Weaving - 95 NB Exit Ramp to 95 SB On Ramp	See Merge, Diverage and Weaving Volumes											
	Fairfax Cnty Pky N-S	Loisdale Rd												
46	Existing Vol		0	1570	219	194	1796	546	0	186	382	196	0	683
	17Alt1-13-AM Pk Hr (41.7%)		0	-119	-40	96	-65	0	0	0	112	-12	0	19
	17Alt1-13-AM Grth Fctr %		0%	-9%	-47%	34%	-3%	0%	0%	0%	75%	-31%	0%	10%
	2017 Alt 1 w/ Growth fctrs		0	1421	117	261	1740	546	0	186	667	134	0	750
	Diff check GF- Abs (<50 OK)		0	-30	**-62**	-29	9	0	0	0	**173**	-49	0	48
	Use average of Difference and growth factors methods										580	159		
	Use Average of existing and Abs Change values				199							190		
	Rounded Volumes		0	1425	200	275	1750	550	0	200	575	200	0	750

FORT BELVOIR TMP TRAFFIC ANALYSIS														
	2017 Alt 1 AM Traffic Volume Computations		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)										
	12/24/2013			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Fairfax Cnty Pkwy N-S	**Terminal Rd**												
47	**Existing Vol**		**62**	**1326**	**14**	**63**	**2606**	**307**	**114**	**4**	**23**	**8**	**7**	**38**
	17Alt1-13-AM Pk Hr (41.7%)		6	-161	16	56	55	-77	2	0	0	0	0	0
	17Alt1-13-AM Grth Fctr %		6%	-15%	80%	64%	3%	-16%	1%	0%	1%	0%	0%	0%
	2017 Alt 1 w/ Growth fctrs		66	1133	25	103	2689	257	115	4	23	8	7	38
	Diff check GF- Abs (<50 OK)		-3	-32	-5	-16	28	27	-1	0	0	0	0	0
	Rounded Volumes		**70**	**1125**	**30**	**100**	**2700**	**250**	**125**	**10**	**20**	**10**	**10**	**40**
	Fairfax Cnty Pkwy N-S	**750' south of Terminal Rd**												
48	**Existing Vol**		**0**	**1358**	**103**	**174**	**2413**	**0**	**0**	**0**	**0**	**28**	**0**	**42**
	17Alt1-13-AM Pk Hr (41.7%)		0	-147	-10	12	44	0	0	0	0	-6	0	8
	17Alt1-13-AM Grth Fctr %		0%	-13%	-7%	5%	3%	0%	0%	0%	0%	-37%	0%	16%
	2017 Alt 1 w/ Growth fctrs		0	1188	95	183	2482	0	0	0	0	18	0	49
	Diff check GF- Abs (<50 OK)		0	-23	2	-3	25	0	0	0	0	-4	0	-2
	Rounded Volumes		**0**	**1200**	**100**	**175**	**2475**	**0**	**0**	**0**	**0**	**20**	**0**	**50**
	Telegraph Rd E-W	**Hayfield Rd**												
49	Existing Vol		**59**	**70**	**35**	**258**	**20**	**373**	**155**	**477**	**15**	**1**	**575**	**52**
	17Alt1-13-AM Pk Hr (41.7%)		0	-23	6	2	16	236	339	-26	0	-24	132	-17
	17Alt1-13-AM Grth Fctr %		0%	-14%	10%	31%	32%	0%	1284%	-4%	0%	-42%	30%	-85%
	2017 Alt 1 w/ Growth fctrs		59	60	38	339	26	373	2145	456	15	1	749	8
	Diff check GF- Abs (<50 OK)		0	13	-3	79	-10	**-236**	**1651**	5	0	24	41	-27
	Add Abs values to Existing Volumes							609	494					
	Rounded Volumes		**60**	**60**	**40**	**350**	**30**	**600**	**500**	**450**	**20**	**0**	**750**	**10**
50	**Telegraph Rd E-W**	**Mulligan Rd**	Synthesized East West volumes based on Telegraph at DCEETA											
	Existing Vol		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**970**	**0**	**0**	**687**	**0**
	17Alt1-13-AM Pk Hr (41.7%)		436	0	433	0	0	0	0	-111	437	433	-47	0
	17Alt1-13-AM Grth Fctr %		0%	0%	0%	0%	0%	0%	0%	-17%	0%	0%	-9%	0%
	2017 Alt 1 w/ Growth fctrs		0	0	0	0	0	0	0	804	0	0	622	0
	Diff check GF- Abs (<50 OK)		-436	**0**	-433	0	0	0	0	-55	-437	-433	-18	0
	Use average of Difference and growth factors methods									832				
	New Vols used for Mulligan		436		433						437	433		
	Rounded Volumes		**450**	**0**	**425**	**0**	**0**	**0**	**0**	**825**	**450**	**450**	**625**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																
	2017 Alt 1 AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)											
	12/24/2013				>100 Rnd to 25x (up if >25+10)						>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Telegraph Rd E-W		**Road B (DCEETA)**												
51	**Existing Vol**			**35**	**0**	**4**	**1**	**0**	**1**	**19**	**965**	**228**	**50**	**635**	**2**
	17Alt1-13-AM	Pk Hr (41.7%)		-4	0	12	0	0	0	0	315	-35	38	350	0
	17Alt1-13-AM Grth Fctr %			-6%	0%	48%	0%	0%	0%	0%	51%	-11%	53%	82%	0%
	2017 Alt 1 w/ Growth fctrs			33	0	6	1	0	1	19	1453	203	76	1159	2
	Diff check GF- Abs (<50 OK)			2	0	-10	0	0	0	0	**174**	9	-12	**173**	0
	Use average of Difference and growth factors methods										1367			1072	
	Rounded Volumes			**30**	**0**	**10**	**0**	**0**	**0**	**20**	**1375**	**200**	**80**	**1075**	**0**
	Telegraph Rd E-W		**Beulah St**												
52	**Existing Vol**			**6**	**85**	**29**	**180**	**480**	**220**	**406**	**829**	**203**	**197**	**298**	**91**
	17Alt1-13-AM	inc 41.7%		-2	56	-24	241	-44	-162	-275	63	25	-8	7	347
	17Alt1-13-AM%			-92%	28%	-59%	175%	-9%	-29%	-30%	8%	0%	-6%	2%	1082%
	2017 Alt 1 w/ Growth fctrs			0	109	12	495	436	156	286	899	203	185	304	1076
	Difference check (>50)			-4	-32	7	**74**	0	**98**	**155**	6	-25	-4	-1	**637**
	Use average of Difference and growth factors methods						458								
	Use Average of existing and Abs Change values														265
	ABSDelt>%Delta		Average Exist & Exist*Delta%						188	346					
	Rounded Volumes			**0**	**100**	**10**	**450**	**450**	**200**	**350**	**900**	**200**	**175**	**300**	**275**
	Telegraph Rd		**Newington Rd**												
			Original Coding from Synchro	0	0	0	94	0	10	71	1198	0	3	438	91
53	**Existing Vol**		**Telegraph N-S Revised coding to match moc**	**71**	**1198**	**0**	**3**	**438**	**91**	**94**	**0**	**10**	**0**	**0**	**0**
	17Alt1-13-AM	Pk Hr (41.7%)		0	-344	0	0	-146	-11	157	0	-68	0	0	0
	17Alt1-13-AM Grth Fctr %			-2%	-22%	0%	0%	-23%	-4%	108%	0%	-89%	0%	0%	0%
	2017 Alt 1 w/ Growth fctrs			69	930	0	3	339	87	196	0	1	0	0	0
	Diff check GF- Abs (<50 OK)			-2	**77**	0	0	48	7	**-55**	0	**59**	0	0	0
	Use average of Difference and growth factors methods									223		-28			
	ABSDelt>%Delta		Average Exist & Exist*Delta%		1064										
	Retain Existing Value											10			
	Rounded Volumes			**70**	**1075**	**0**	**0**	**350**	**90**	**225**	**0**	**10**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS														
2017 Alt 1 AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)										
12/24/2013				>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values											
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Fairfax Cnty Pkwy SB Ramps	Telegraph Rd (S)												
54	Existing Vol		0	0	0	132	1	160	0	1203	298	110	252	0
	17Alt1-13-AM Pk Hr (41.7%)		0	0	0	17	0	4	0	-243	-82	-227	18	0
	17Alt1-13-AM Grth Fctr %		0%	0%	0%	189%	0%	9%	0%	-14%	-15%	-77%	5%	0%
	2017 Alt 1 w/ Growth fctrs		0	0	0	381	1	174	0	1032	252	25	263	0
	Diff check GF- Abs (<50 OK)		0	0	0	**232**	0	10	0	**73**	36	**142**	-7	0
	Use average of Difference and growth factors methods					265								
	ABSDelt>%Delta	Average Exist & Exist*Delta%								1118		68		
	Rounded Volumes		**0**	**0**	**0**	**275**	**0**	**175**	**0**	**1125**	**250**	**70**	**275**	**0**
54a	Fairfax Cnty Pky SB	Exit Ramp to Telegraph Rd	See Merge, Diverage and Weaving Volumes											
54b	Fairfax Cnty Pky SB	On Ramp from Telegraph Rd	See Merge, Diverage and Weaving Volumes											
	Fairfax Cnty Pkwy NB Ramps	Telegraph Rd (N)												
55	Existing Vol		19	1	131	0	0	0	390	989	0	0	348	201
	17Alt1-13-AM Pk Hr (41.7%)		-7	0	-79	0	0	0	52	-278	0	0	-202	25
	17Alt1-13-AM Grth Fctr %		-34%	0%	-82%	0%	0%	0%	24%	-18%	0%	0%	-30%	26%
	2017 Alt 1 w/ Growth fctrs		13	1	24	0	0	0	484	807	0	0	244	254
	Diff check GF- Abs (<50 OK)			0	-28	0	0	0	43	**96**	0	0	**97**	27
	ABSDelt>%Delta	Average Exist & Exist*Delta%								898			296	
	Rounded Volumes		**10**	**0**	**30**	**0**	**0**	**0**	**475**	**900**	**0**	**0**	**300**	**250**
55a	Fairfax Cnty Pky NB	On Ramp from Telegraph Rd	See Merge, Diverage and Weaving Volumes											
55b	Fairfax Cnty Pky NB	Exit Ramp to Telegraph Rd	See Merge, Diverage and Weaving Volumes											
56	Fairfax Cnty Pky NB - SB	Ehlers Rd	Synthesize from Kingman - No Signal											
	Existing Vol		0	0	0	0	0	0	0	2361	0	0	1005	
	17Alt1-13-AM Pk Hr (41.7%)		0	0	0	0	0	0	0	-293	0	0	-320	0
	17Alt1-13-AM Grth Fctr %		0%	0%	0%	0%	0%	0%	0%	-13%	0%	0%	-29%	0%
	2017 Alt 1 w/ Growth fctrs		0	0	0	0	0	0	0	2062	0	0	716	0
	Diff check GF- Abs (<50 OK)			0	0	0	0	0	0	-6	0	0	31	0
	Rounded Volumes		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2075**	**0**	**0**	**725**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																
	2017 Alt 1 AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)											
	12/24/2013				>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)								
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
57	Fairfax Cnty Pky NB - SB		Kingman Rd												
	Existing Vol			6	844	426	1350	984	27	3	6	4	39	3	158
	17Alt1-13-AM	inc 41.7%		10	-357	-133	320	-658	39	8	2	2	-65	1	30
	17Alt1-13-AM%			33%	-37%	-93%	25%	-79%	20%	30%	78%	8%	-48%	44%	25%
	2017 Alt 1 w/ Growth fctrs			8	534	31	1688	209	32	4	11	4	20	4	198
	Difference check (>50)			-8	47	**-262**	17	**-116**	-33	-7	3	-2	46	0	10
	ABSDelt>%Delta		Average Exist & Exist*Delta%		689										
	ABSDelt<%Delta		Average Exist & (Exist+Delta)			360		655							
	Rounded Volumes			**10**	**700**	**350**	**1700**	**650**	**30**	**10**	**10**	**10**	**20**	**10**	**200**
	I-95 Ramps		Lorton Rd (W)												
58	Existing Vol			3	0	4	89	0	67	143	1750	12	8	409	136
	17Alt1-13-AM	inc 41.7%	Corrected Column Placement	0	0	0	10	0	21	-30	563	0	0	174	88
	17Alt1-13-AM%			0%	0%	0%	6%	0%	10%	-10%	30%	0%	0%	55%	132%
	2017 Alt 1 w/ Growth fctrs			3	0	4	94	0	73	128	2278	12	8	635	315
	Difference check (>50)			0	0	**0**	-5	**0**	-14	15	-35	0	0	52	91
	Use average of Difference and growth factors methods													609	270
	Rounded Volumes			**0**	**0**	**10**	**100**	**0**	**70**	**125**	**2275**	**10**	**10**	**600**	**275**
	I-95 Ramps		Lorton Rd (E)												
59	Existing Vol			6	17	10	191	26	34	798	998	37	28	508	422
	17Alt1-13-AM	inc 41.7%	Corrected Column Placement	0	0	0	67	0	59	168	406	0	0	202	72
	17Alt1-13-AM%			0%	0%	0%	9%	0%	116%	22%	32%	0%	0%	61%	59%
	2017 Alt 1 w/ Growth fctrs			6	17	10	208	26	73	970	1321	37	28	819	671
	Difference check (>50)			0	0	**0**	-49	**0**	-20	4	**-83**	0	0	**109**	**177**
	Use average of Difference and growth factors methods						233				1362			765	583
	Rounded Volumes			**10**	**20**	**10**	**225**	**30**	**70**	**975**	**1375**	**40**	**30**	**775**	**575**

FORT BELVOIR TMP TRAFFIC ANALYSIS																
	2017 Alt 1 AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)											
	12/24/2013				>100 Rnd to 25x (up if >25+10)						>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Route 1		Lorton Rd (T int)												
60	Existing Vol		Route 1 coded as N-S	3	2503	0	7	562	145	737	0	15	0	0	0
	17Alt1-13-AM	Pk Hr (41.7%)		2	-294	0	0	-91	214	519	0	-5	0	0	0
	17Alt1-13-AM Grth Fctr %			6%	-15%	0%	0%	-10%	115%	47%	0%	-13%	0%	0%	0%
	2017 Alt 1 w/ Growth fctrs			3	2135	0	7	504	312	1081	0	13	0	0	0
	Diff check GF- Abs (<50 OK)			-2	**-74**	0	0	32	-47	**-175**	0	3	0	0	0
	Use average of Difference and growth factors methods									1168					
	ABSDelt<%Delta		Average Exist & (Exist+Delta)		2356										
	Rounded Volumes			**0**	**2350**	**0**	**10**	**500**	**325**	**1175**	**0**	**10**	**0**	**0**	**0**
	Route 1		Pohick Rd (T int.)												
61	Existing Vol		Route 1 coded as E-W	1	0	2	335	1	86	134	3187	1	1	612	103
	17Alt1-13-AM	Pk Hr (41.7%)		0	0	0	90	0	6	-22	233	0	0	96	4
	17Alt1-13-AM Grth Fctr %			0%	0%	0%	16%	0%	12%	-25%	8%	0%	0%	9%	10%
	2017 Alt 1 w/ Growth fctrs			1	0	2	388	1	96	100	3430	1	1	670	113
	Diff check GF- Abs (<50 OK)			0	0	0	-37	0	4	-11	10	0	0	-38	6
	Rounded Volumes			**0**	**0**	**0**	**400**	**0**	**100**	**100**	**3425**	**0**	**0**	**675**	**125**
	Route 1		Telegraph Rd												
62	Existing Vol		Route 1 coded as E-W	9	156	191	41	16	194	1094	2390	12	12	502	98
	17Alt1-13-AM	Pk Hr (41.7%)		1	-40	15	24	-1	38	-290	613	0	-2	61	14
	17Alt1-13-AM Grth Fctr %			711%	-9%	4%	0%	-6%	12%	-17%	32%	0%	-14%	8%	0%
	2017 Alt 1 w/ Growth fctrs			73	142	199	41	15	217	909	3155	12	10	544	98
	Diff check GF- Abs (<50 OK)			**63**	25	-8	-24	0	-15	**105**	**152**	0	0	-19	-14
	Use average of Difference and growth factors methods			41							3079				
	ABSDelt>%Delta		Average Exist & Exist*Delta%							1001					
	Rounded Volumes			**40**	**150**	**200**	**40**	**20**	**225**	**1000**	**3075**	**10**	**10**	**550**	**100**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
	2017 Alt 1 AM Traffic Volume Computations				Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)											
	12/24/2013					>100 Rnd to 25x (up if >25+10)		>100 Rnd to 25x (down if<25+11)									
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values												
Site	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
	Fairfax County Pkwy		Route 1														
63	Existing Vol		Route 1 coded as E-W		0	0	0	833	0	22	394	2073	0	0	569	921	
	17Alt1-13-AM	Pk Hr (41.7%)			0	0	0	-703	0	-18	13	639	0	0	92	-493	
	17Alt1-13-AM Grth Fctr %				0%	0%	0%	-77%	0%	-23%	3354%	28%	0%	0%	14%	-43%	
	2017 Alt 1 w/ Growth fctrs				0	0	0	195	0	17	13611	2649	0	0	647	524	
	Diff check GF- Abs (<50 OK)				0	0	0	**65**	0	13	**13204**	**-63**	0	0	-13	**96**	
	Average of existing and Approach growth volumes							514				2361				723	
	Use absolute growth										407						
	Rounded Volumes				**0**	**0**	**0**	**525**	**0**	**20**	**400**	**2375**	**0**	**0**	**650**	**725**	
	Route 1		Pohick Rd (Tulley Gate)														
64	Existing Vol		Route 1 coded as E-W		**147**	**7**	**10**	**102**	**64**	**6**	**5**	**1838**	**1047**	**93**	**1363**	**34**	
	17Alt1-13-AM	Pk Hr (41.7%)	Route 1	Pohick Rd	-62	0	0	0	0	0	0	300	-364	0	-339	0	
	17Alt1-13-AM Grth Fctr %		Route 1	Pohick Rd	-19%	0%	6%	0%	0%	0%	0%	15%	-29%	6%	-23%	0%	
	2017 Alt 1 w/ Growth fctrs				119	7	11	102	64	6	5	2118	743	99	1052	34	
	Diff check GF- Abs (<50 OK)				34	0	0	0	0	0	0	-19	**60**	5	28	0	
	ABSDelt>%Delta		Average Exist & Exist*Delta%										895		1208		
	Rounded Volumes				**125**	**10**	**10**	**100**	**70**	**10**	**10**	**2125**	**900**	**100**	**1200**	**40**	
	Route 1 at Belvoir Rd		Original Synchro Coding US 1 N-S		0	1460	532	337	1357	0	0	0	0	104	0	130	
65	Existing Vol		Revised Cding to match mdl US 1 E-W		**104**	**0**	**130**	**0**	**0**	**0**	**0**	**1460**	**532**	**337**	**1357**	**0**	
	17Alt1-13-AM	Pk Hr (41.7%)			-62	23	-30	223	6	34	165	198	-63	-119	-311	789	
	17Alt1-13-AM Grth Fctr %				-44%	0%	-15%	0%	0%	0%	0%	11%	-38%	-22%	-23%	0%	
	2017 Alt 1 w/ Growth fctrs				58	0	110	0	0	0	0	1621	332	263	1044	0	
	Diff check GF- Abs (<50 OK)				16	-23	10	**-223**	-6	-34	**-165**	-37	**-137**	45	-2	**-789**	
	New Vols used for Lieber Gate Vols					23		223	6	34	165					789	
	ABSDelt<%Delta		Average Exist & (Exist+Delta)										500				
	Rounded Volumes				**60**	**20**	**100**	**225**	**10**	**40**	**175**	**1625**	**500**	**275**	**1050**	**800**	

FORT BELVOIR TMP TRAFFIC ANALYSIS														
2017 Alt 1 AM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)										
12/24/2013				>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values											
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
66	**Route 1 at Woodlawn Rd**	**Original Synchro Coding US 1 N-S**	6	1451	0	0	1737	1	1	0	1	0	0	0
	Existing Vol	**Revised Coding to match model US 1 E-W**	**0**	**0**	**0**	**1**	**0**	**1**	**6**	**1451**	**0**	**0**	**1737**	**1**
	17Alt1-13-AM Pk Hr (41.7%)		0	0	0	0	0	0	0	391	0	0	359	0
	17Alt1-13-AM Grth Fctr %		0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	19%	0%
	2017 Alt 1 w/ Growth fctrs		0	0	0	1	0	1	6	1736	0	0	2067	1
	Diff check GF- Abs (<50 OK)		0	0	0	0	0	0	0	**-107**	0	0	-29	0
	Use average of Difference and growth factors methods									1789				
	Rounded Volumes		**0**	**0**	**0**	**0**	**0**	**0**	**10**	**1800**	**0**	**0**	**2075**	**0**
67	**Mulligan Rd**	**Pole Rd**												
	Existing Vol (No Signal)	**Synthesized Vols frm Rt1 Vols**	**0**	**0**	**133**	**0**	**0**	**0**	**0**	**0**	**0**	**256**	**0**	**0**
	17Alt1-13-AM Pk Hr (41.7%)		0	566	49	286	585	0	0	0	0	23	0	303
	17Alt1-13-AM Grth Fctr %		0%	0%	272%	0%	0%	0%	0%	0%	0%	44%	0%	0%
	2017 Alt 1 w/ Growth fctrs		0	566	495	286	585	0	0	0	0	369	0	303
	Diff check GF- Abs (<50 OK)		0	0	**313**	0	0	0	0	**0**	0	**90**	0	0
	Use average of Difference and growth factors methods				339							324		
	Rounded Volumes		**0**	**575**	**350**	**300**	**575**	**0**	**0**	**0**	**0**	**325**	**0**	**300**
68	**US Route 1**	**Mulligan Rd**												
	Existing Vol		**323**	**21**	**32**	**32**	**73**	**151**	**100**	**1021**	**333**	**111**	**1220**	**12**
	17Alt1-13-AM Pk Hr (41.7%)		27	262	-92	56	183	162	8	278	106	-177	169	125
	17Alt1-13-AM Grth Fctr %		10%	1031%	-74%	0%	582%	57%	4%	19%	32%	-59%	13%	0%
	2017 Alt 1 w/ Growth fctrs		356	238	**8**	32	498	236	104	1213	439	45	1375	12
	Diff check GF- Abs (<50 OK)		6	-46	**68**	**-56**	**242**	**-77**	-4	**-86**	0	**111**	-15	**-125**
	Use average of Difference and growth factors methods			260		60	377	275		1256				74
	Use Existing Volumes				32									
	ABSDelt>%Delta	Average Exist & Exist*Delta%										78		
	Rounded Volumes		**350**	**250**	**30**	**60**	**375**	**275**	**100**	**1250**	**450**	**80**	**1375**	**80**

FORT BELVOIR TMP TRAFFIC ANALYSIS														
2017 Alt 1 AM Traffic Volume Computations			**Rounding Rules:**	**"1 to 99 Rnd to 10x (up if >d3)**										
12/24/2013				**>100 Rnd to 25x (up if >25+10)**					**>100 Rnd to 25x (down if<25+11)**					
Actual values are displayed as whole numbers			**Products are based on mutiplication of actual values**											
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
69	**Mount Vernon Highway**	**Mount Vernon Rd**												
	Existing Vol		**380**	**410**	**0**	**0**	**333**	**232**	**52**	**0**	**137**	**0**	**0**	**0**
	17Alt1-13-AM Pk Hr (41.7%)		-4	190	0	0	167	-85	-15	0	-10	0	0	0
	17Alt1-13-AM Grth Fctr %		-3%	78%	0%	0%	60%	-26%	-11%	0%	-6%	0%	0%	0%
	2017 Alt 1 w/ Growth fctrs		369	728	0	0	534	171	46	0	128	0	0	0
	Diff check GF- Abs (<50 OK)		-7	**128**	0	0	33	24	9	0	1	0	0	0
	Use average of Difference and growth factors methods			664										
	Rounded Volumes		**375**	**675**	**0**	**0**	**525**	**175**	**50**	**0**	**125**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																
2017 No-Build PM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)												
12/26/2013				>100 Rnd to 25x (up if >25+10)						>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
28	**Franconia Springfld Pkwy**	**EB Exit Ramp to Rolling Rd**	**See Merge, Diverage and Weaving Volumes**											
29	**Franconia Springfld Pkwy**	**WB On Ramp from Rolling Rd**	**See Merge, Diverage and Weaving Volumes**											
	Franconia Springfld Pkwy	**Spring Village Dr**												
30	**Existing Volumes**		25	4	104	103	8	80	29	1264	44	195	3385	82
	17NB-13 PM Pk Prd Delta		-39	1	22	27	1	-11	21	-168	11	8	626	6
	17NB-13 PM Pk Hr (29.4%)		-11	0	6	8	0	-3	6	-50	3	2	184	2
	17NB-13 PM Grth Fctr (%)		-18%	19%	7%	14%	20%	-7%	11%	-4%	6%	1%	6%	2%
	2017 NB = Exist x Grth Fctr		21	5	111	117	10	75	32	1218	46	198	3593	83
	Diff check GF- Abs (<50 OK)		7	0	1	6	1	**-2**	-3	3	-1	1	23	**0**
	Rounded No-Build Volumes		**20**	**10**	**125**	**125**	**10**	**80**	**30**	**1225**	**50**	**200**	**3600**	**80**
	Franconia Springfld Pkwy	**EB Exit & On Ramps at Backlick Rd**												
31	**Existing Volumes**		263	1193	0	3	830	208	549	3	44	1	1	2
	17NB-13 PM Pk Prd Delta		-160	-159	0	0	-678	1389	125	0	-1	0	0	0
	17NB-13 PM Pk Hr (29.4%)		-47	-47	0	0	-199	408	37	0	0	0	0	0
	17NB-13 PM Grth Fctr (%)		-11%	-6%	0	0	-19%	248%	14%	0	-13%	0	0	0
	2017 NB = Exist x Grth Fctr		235	1117	0	3	674	723	625	3	38	1	1	2
	Diff check GF- Abs (<50 OK)		19	-29	0	0	43	**107**	39	0	-5	0	0	**0**
	Average Existing & Exist+Numerical Increase							412						
	Rounded No-Build Volumes		**225**	**1125**	**0**	**0**	**675**	**425**	**625**	**0**	**40**	**0**	**0**	**0**
	Franconia Springfld Pkwy	**WB Exit & On Ramps at Backlick Rd**												
32	**Existing Volumes**		69	1660	1	7	811	1122	238	12	210	28	17	16
	17NB-13 PM Pk Prd Delta		-4	-29	0	0	131	-654	-502	0	579	0	0	0
	17NB-13 PM Pk Hr (29.4%)		-1	-9	0	0	39	-192	-147	0	170	0	0	0
	17NB-13 PM Grth Fctr (%)		-41%	-1%	0	0	4%	-19%	-35%	0	62%	0	0	0
	2017 NB = Exist x Grth Fctr		41	1646	1	7	844	912	154	12	341	28	17	16
	Diff check GF- Abs (<50 OK)		-27	-6	0	0	-6	-18	**63**	0	-39	0	0	0
	Average Existing value & GF Decrease								196					
	Rounded No-Build Volumes		**40**	**1650**	**0**	**10**	**850**	**925**	**200**	**10**	**350**	**30**	**20**	**20**

FORT BELVOIR TMP TRAFFIC ANALYSIS															
2017 No-Build PM Traffic Volume Computations			Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)											
12/26/2013				>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
	Franconia Springfld Pkwy	**I-95 HOV ramps**												
33	**Existing Volumes**		0	0	0	142	0	278	0	1283	313	420	2264	0
	17NB-13 PM Pk Prd Delta		0	0	0	434	0	1980	0	-12	997	893	-604	0
	17NB-13 PM Pk Hr (29.4%)		0	0	0	128	0	582	0	-3	293	262	-178	0
	17NB-13 PM Grth Fctr (%)		0	0	0	30%	0	125%	0	0%	169%	165%	-7%	0
	2017 NB = Exist x Grth Fctr		0	0	0	185	0	626	0	1280	842	1112	2100	0
	Diff check GF- Abs (<50 OK)		0	0	0	**-85**	0	**-234**	**0**	1	**236**	**430**	13	0
	Average GF & Abs values					227		743			724	897		
	Rounded No-Build Volumes		**0**	**0**	**0**	**225**	**0**	**750**	**0**	**1275**	**725**	**900**	**2100**	**0**
	Franconia Springfld Pkwy	**EB Exit & On Ramps at Frontier Rd**												
34	**Existing Volumes**		0	235	451	898	220	0	244	1	140	0	0	0
	17NB-13 PM Pk Prd Delta			97	31	475	25		-1363	0	-2			
	17NB-13 PM Pk Hr (29.4%)		0	28	9	140	7	0	**-401**	0	0	0	0	0
	17NB-13 PM Grth Fctr (%)			35%	31%	29%	14%		-54%		-2%			
	2017 NB = Exist x Grth Fctr		0	316	590	1157	250	0	112	0	138	0	0	0
	Diff check GF- Abs (<50 OK)		0	**53**	**130**	**120**	23	**0**	**269**	-1	-2	0	0	**0**
	Average GF & Abs values			290	525	1097								
	Average Existing value & GF Decrease								178					
	Rounded No-Build Volumes		**0**	**300**	**525**	**1100**	**250**	**0**	**175**	**0**	**150**	**0**	**0**	**0**
	Franconia Springfld Pkwy	**WB Exit & On Ramps at Frontier Rd**												
35	**Existing Volumes**		512	535	0	0	1080	629	0	0	0	17	1	810
	17NB-13 PM Pk Prd Delta		49	-1315	0	0	482	-382	0	0	0	17	0	1284
	17NB-13 PM Pk Hr (29.4%)		14	-387	0	0	142	-112	0	0	0	5	0	378
	17NB-13 PM Grth Fctr (%)		31%	-50%	0	0	28%	-10%	0	0	0	22%	0	80%
	2017 NB = Exist x Grth Fctr		669	269	0	0	1378	568	0	0	0	21	0	1460
	Diff check GF- Abs (<50 OK)		**142**	**121**	0	0	**156**	**52**	0	0	0	-1	-1	**272**
	Average GF & Abs values		598				1300							1324
	Average Existing value & GF Decrease			402				599						
	Rounded No-Build Volumes		**600**	**400**	**0**	**0**	**1300**	**600**	**0**	**0**	**0**	**20**	**0**	**1325**

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	12/26/2013			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values													
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
	Franconia Springfld Pkwy	Beulah St.														
36	Existing Volumes		553	434	173	309	473	307	368	1205	631	158	1078	132		
	17NB-13 PM Pk Prd Delta		686	-334	-42	7	-878	1107	805	433	1054	-526	131	-10		
	17NB-13 PM Pk Hr (29.4%)		202	-98	-12	2	-258	325	237	127	310	-155	38	-3		
	17NB-13 PM Grth Fctr (%)		28%	-18%	-7%	5%	-29%	147%	73%	16%	44%	-38%	4%	-12%		
	2017 NB = Exist x Grth Fctr		705	356	161	326	334	760	635	1398	910	98	1122	116		
	Diff check GF- Abs (<50 OK)		-49	20	0	15	**119**	**127**	30	**66**	-31	**94**	6	-13		
	Average GF & Abs values							696		1365						
	Average Existing value & GF Decrease						404					128				
	Rounded No-Build Volumes		**700**	**350**	**175**	**325**	**400**	**700**	**625**	**1375**	**900**	**125**	**1125**	**125**		
37	Fairfax Cnty Pky N-S	On Ramp loop frm SB Barta	See Merge, Diverage and Weaving Volumes													
38	Fairfax Cnty Pky SB	SB Exit Ramp at Barta Rd														
	Realigned Existing Volumes		0	0	0	22	0	580	0	461	0	1	409	0		
	17NB-13 PM Pk Prd Delta		0	0	0	40	0	-231	0	563	0	0	-277	0		
	17NB-13 PM Pk Hr (29.4%)		0	0	0	12	0	-68	0	166	0	0	-82	0		
	17NB-13 PM Grth Fctr (%)		0	0	0	11%	0	-10%	0	78%	0	0	-56%	0		
	2017 NB = Exist x Grth Fctr		0	0	0	24	0	522	0	821	0	1	182	0		
	Diff check GF- Abs (<50 OK)		0	0	0	-9	0	10	0	**195**	0	0	**-146**	0		
	Average GF & Abs values									724						
	Average Existing value & Abs Decrease												368			
	Rounded No-Build Volumes		**0**	**0**	**0**	**30**	**0**	**525**	**0**	**725**	**0**	**0**	**375**	**0**		
38a	Fairfax Cnty Pky SB	Barta Rd Exit Ramp	See Merge, Diverage and Weaving Volumes													
	Fairfax Cnty Pky NB	NB Exit Ramp at Barta Rd														
39	Realigned Existing Volumes		270	0	16	0	0	0	0	38	0	0	361	0		
	17NB-13 PM Pk Prd Delta		-64	0	0	0	0	0	0	39	0	0	-229	-1		
	17NB-13 PM Pk Hr (29.4%)		-19	0	0	0	0	0	0	12	0	0	-67	0		
	17NB-13 PM Grth Fctr (%)		-76%	0	7%	0	0	0	0	10%	0	0	-36%	0%		
	2017 NB = Exist x Grth Fctr		65	0	17	0	0	0	0	42	0	0	232	0		
	Diff check GF- Abs (<50 OK)		**-186**	0	1	0	0	0	0	-8	0	0	**-62**	0		
	Average Existing value & Abs Decrease		261										327			
	Rounded No-Build Volumes		**275**	**0**	**20**	**0**	**0**	**0**	**0**	**40**	**0**	**0**	**325**	**0**		
39a	Fairfax Cnty Pky NB	Barta Rd On Ramp	See Merge, Diverage and Weaving Volumes													
40	Fairfax Cnty Pky NB	On Ramp loop frm NB Barta Rd	See Merge, Diverage and Weaving Volumes													

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values													
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
41	Fairfax Cnty Pky SB	Weaving area - Barta to Boudinot	See Merge, Diverage and Weaving Volumes													
	Backlick Rd N-S	Barta Rd														
42	Existing Vol		19	793	0	0	814	36	659	0	91	0	0	0		
	17NB-13 PM Pk Prd Delta		0	-176	0	0	-596	-55	-138	0	-359	0	0	0		
	17NB-13 PM Pk Hr (29.4%)		0	-52	0	0	-175	-16	-41	0	-106	0	0	0		
	17NB-13 PM Grth Fctr (%)		0%	-10%	0	0	-26%	-4%	-6%	0	-75%	0	0	0		
	2017 NB = Exist x Grth Fctr		19	712	0	0	601	35	621	0	23	0	0	0		
	Diff check GF- Abs (<50 OK)		0	-29	0	0	-38	15	2	0	37	0	0	0		
	Rounded No-Build Volumes		20	725	0	0	600	40	625	0	20	0	0	0		
43	I-95 SB HOT Lanes	Merge from North Area On-Ramp	See Merge, Diverage and Weaving Volumes													
44	Fairfax Cnty Pky NB	Weaving area - bet 95 Ramp to Boudinot	See Merge, Diverage and Weaving Volumes													
45a	Fairfax Cnty Pky SB	Weaving - 95 SB Exit Ramp to 95 NB On Ramp	See Merge, Diverage and Weaving Volumes													
45b	Fairfax Cnty Pky NB	Weaving - 95 NB Exit Ramp to 95 SB On Ramp	See Merge, Diverage and Weaving Volumes													
	Fairfax Cnty Pky N-S	Loisdale Rd														
46	Existing Vol		0	1916	114	156	1469	754	0	96	133	243	0	652		
	17NB-13 PM Pk Prd Delta		0	-191	-86	-22	-158	0	0	-61	-15	-372	0	198		
	17NB-13 PM Pk Hr (29.4%)		0	-56	-25	-6	-47	0	0	-18	-4	-110	0	58		
	17NB-13 PM Grth Fctr (%)		0	-3%	-20%	-3%	-4%	0	0	-24%	-6%	-37%	0	13%		
	2017 NB = Exist x Grth Fctr		0	1858	92	152	1417	754	0	73	125	153	0	735		
	Diff check GF- Abs (<50 OK)		0	-1	3	2	-5	0	0	-5	-4	19	0	24		
	Rounded No-Build Volumes		0	1850	90	150	1425	750	0	70	125	150	0	725		
	Fairfax Cnty Pkwy N-S	Terminal Rd														
47	Existing Vol		21	1634	8	56	1563	87	305	9	117	28	10	126		
	17NB-13 PM Pk Prd Delta		8	-406	0	0	-542	-4	77	0	-152	22	0	52		
	17NB-13 PM Pk Hr (29.4%)		2	-119	0	0	-159	-1	23	0	-45	6	0	15		
	17NB-13 PM Grth Fctr (%)		5%	-7%	0	0	-11%	-1%	7%	0	-23%	0	0	0		
	2017 NB = Exist x Grth Fctr		22	1518	8	56	1392	87	327	9	90	28	10	126		
	Diff check GF- Abs (<50 OK)		-1	3	0	0	-12	1	-1	0	18	-6	0	-15		
	Rounded No-Build Volumes		20	1525	10	60	1400	90	325	10	90	30	10	125		

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
	Fairfax Cnty Pkwy N-S		750' south of Terminal Rd													
48	Existing Vol			0	1594	82	36	1647	0	0	0	0	102	0	98	
	17NB-13 PM Pk Prd Delta			0	-490	-32	-2	-670	0	0	0	0	-202	0	92	
	17NB-13 PM Pk Hr (29.4%)			0	-144	-9	0	-197	0	0	0	0	-59	0	27	
	17NB-13 PM Grth Fctr (%)			0	-9%	-26%	0%	-13%	0	0	0	0	-31%	0	17%	
	2017 NB = Exist x Grth Fctr			0	1448	61	36	1434	0	0	0	0	70	0	115	
	Diff check GF- Abs (<50 OK)			0	-2	-12	0	-16	0	0	0	0	28	0	-11	
	Rounded No-Build Volumes			**0**	**1450**	**60**	**40**	**1425**	**0**	**0**	**0**	**0**	**70**	**0**	**125**	
	Telegraph Rd E-W		Hayfield Rd													
49	Existing Vol			22	51	27	256	87	191	350	665	40	29	480	104	
	17NB-13 PM Pk Prd Delta			0	-53	-5	-89	-77	**1118**	853	311	0	15	-147	4	
	17NB-13 PM Pk Hr (29.4%)			0	-16	-1	-26	-23	**329**	251	92	0	4	-43	1	
	17NB-13 PM Grth Fctr (%)			0	-13%	-3%	-84%	-14%	**171%**	74%	20%	0	6%	-8%	22%	
	2017 NB = Exist x Grth Fctr			22	44	26	41	75	518	609	798	40	31	444	127	
	Diff check GF- Abs (<50 OK)			0	9	1	**-189**	10	-2	8	41	0	-3	7	22	
	Average Existing value & Abs Decrease						243									
	Rounded No-Build Volumes			**20**	**50**	**30**	**250**	**80**	**525**	**600**	**800**	**40**	**30**	**450**	**125**	
50	Telegraph Rd E-W		Mulligan Rd	Synthesized East West volumes based on Telegraph at DCEETA												
	Existing Vol			0	0	0	0	0	0	0	830	0	0	932	0	
	17NB-13 PM Pk Prd Delta			1943	0	1530	0	0	0	0	-298	1626	1529	-495	0	
	17NB-13 PM Pk Hr (29.4%)			571	0	450	0	0	0	0	-88	478	449	-145	0	
	17NB-13 PM Grth Fctr (%)			0	0	0	0	0	0	0	-17%	0	0	-23%	0	
	2017 NB = Exist x Grth Fctr			571	0	450	0	0	0	0	689	478	449	714	0	
	Diff check GF- Abs (<50 OK)										**-53**			**-72**		
	Average Existing value & Abs Decrease										786			859		
	Rounded No-Build Volumes			**575**	**0**	**450**	**0**	**0**	**0**	**0**	**800**	**475**	**450**	**850**	**0**	
	Telegraph Rd E-W		Road B (DCEETA)													
51	Existing Vol			359	0	61	1	0	1	8	768	28	6	925	1	
	17NB-13 PM Pk Prd Delta			-96	0	144	0	0	0	0	1184	-61	117	1332	0	
	17NB-13 PM Pk Hr (29.4%)			-28	0	42	0	0	0	0	348	-18	34	391	0	
	17NB-13 PM Grth Fctr (%)			-9%	0	64%	0	0	0	0	77%	-12%	86%	67%	0	
	2017 NB = Exist x Grth Fctr			325	0	100	1	0	1	8	1360	25	11	1547	1	
	Diff check GF- Abs (<50 OK)			-5	0	-3	0	0	0	0	**243**	15	-29	**230**	0	
	Average GF & Abs values										1238			1432		
	Rounded No-Build Volumes			**325**	**0**	**100**	**0**	**0**	**0**	**10**	**1250**	**30**	**10**	**1425**	**0**	

FORT BELVOIR TMP TRAFFIC ANALYSIS															
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Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
	Telegraph Rd E-W	**Beulah St**												
52	**Existing Vol**		64	478	263	101	161	448	326	422	10	81	802	256
	17NB-13 PM Pk Prd Delta		0	-297	-72	1259	-284	-959	-662	-65	50	-263	184	1314
	17NB-13 PM Pk Hr (29.4%)		0	-87	-21	370	-83	-282	-195	-19	15	-77	54	386
	17NB-13 PM Grth Fctr (%)		0	-20%	-33%	458%	-20%	-33%	-31%	-4%	0	-76%	9%	229%
	2017 NB = Exist x Grth Fctr		64	383	175	564	129	300	224	405	10	20	873	842
	Diff check GF- Abs (<50 OK)		0	-7	**-67**	**92**	**51**	**134**	**93**	2	-15	16	17	**199**
	Average Existing and Abs values					286								449
	Average Existing value & GF Decrease							374	275					
	Average Existing volume & Abs Decrease				252									
	Rounded No-Build Volumes		**70**	**375**	**250**	**300**	**125**	**375**	**275**	**400**	**10**	**20**	**875**	**450**
	Telegraph Rd	**Newington Rd**												
		Original Coding from Synchro	0	0	0	150	0	34	76	596	0	2	1062	155
53	**Existing Vol**	**Revised coding to match model**	76	596	0	2	1062	155	150	0	34	0	0	0
	17NB-13 PM Pk Prd Delta		-184	-746	0	0	-1287	512	69	0	0	0	0	0
	17NB-13 PM Pk Hr (29.4%)		-54	-219	0	0	-378	151	20	0	0	0	0	0
	17NB-13 PM Grth Fctr (%)		-96%	-28%	0	0	-30%	80%	6%	0	-3%	0	0	0
	2017 NB = Exist x Grth Fctr		3	426	0	2	748	280	160	0	33	0	0	0
	Diff check GF- Abs (<50 OK)		-19	50	0	0	**64**	-26	-11	0	-1	0	0	0
	Average Existing value & GF Decrease						905							
	Rounded No-Build Volumes		**10**	**425**	**0**	**0**	**900**	**275**	**150**	**0**	**30**	**0**	**0**	**0**
	Fairfax Cnty Pkwy SB Ramps	**Telegraph Rd (S)**												
54	**Existing Vol**		0	0	0	184	1	590	0	427	31	138	1190	0
	17NB-13 PM Pk Prd Delta		0	0	0	9	0	-306	0	82	-194	-338	-1195	0
	17NB-13 PM Pk Hr (29.4%)		0	0	0	3	0	-90	0	24	-57	-99	-351	0
	17NB-13 PM Grth Fctr (%)		0	0	0	4%	0	-18%	0	4%	-31%	-84%	-23%	0
	2017 NB = Exist x Grth Fctr		0	0	0	192	1	481	0	443	21	22	918	0
	Diff check GF- Abs (<50 OK)		0	0	0	6	0	-19	0	-8	47	-16	**80**	0
	Average Existing value & GF Decrease												1054	
	Rounded No-Build Volumes		**0**	**0**	**0**	**200**	**0**	**475**	**0**	**450**	**20**	**20**	**1050**	**0**
54a	**Fairfax Cnty Pky SB**	**Exit Ramp to Telegraph Rd**		**See Merge, Diverage and Weaving Volumes**										
54b	**Fairfax Cnty Pky SB**	**On Ramp from Telegraph Rd**		**See Merge, Diverage and Weaving Volumes**										

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	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
	Fairfax Cnty Pkwy NB Ramps		Telegraph Rd (N)														
55	Existing Vol			307	28	198	0	0	0	119	491	0	0	1031	87		
	17NB-13 PM Pk Prd Delta			81	0	-798	0	0	0	28	63	0	0	-1614	234		
	17NB-13 PM Pk Hr (29.4%)			24	0	-235	0	0	0	8	19	0	0	-474	69		
	17NB-13 PM Grth Fctr (%)			8%	0	-80%	0	0	0	9%	3%	0	0	-35%	199%		
	2017 NB = Exist x Grth Fctr			331	28	39	0	0	0	129	506	0	0	671	260		
	Diff check GF- Abs (<50 OK)			1	0	**75**	0	0	0	2	-4	0	0	**114**	**105**		
	Average Existing value & GF Decrease					118								851			
	Average GF & Abs values														208		
	Rounded No-Build Volumes			**325**	**30**	**125**	**0**	**0**	**0**	**125**	**500**	**0**	**0**	**850**	**200**		
55a	Fairfax Cnty Pky NB		On Ramp from Telegraph Rd	See Merge, Diverage and Weaving Volumes													
55b	Fairfax Cnty Pky NB		Exit Ramp to Telegraph Rd	See Merge, Diverage and Weaving Volumes													
56	Fairfax Cnty Pky NB - SB		Ehlers Rd	Synthesize from Kingman - No Signal													
	Existing Vol			0	0	0	0	0	0	0	1207	0	0	1744	0		
	17NB-13 PM Pk Prd Delta			0	0	0	0	0	0	0	-1106	0	0	-1501	0		
	17NB-13 PM Pk Hr (29.4%)			0	0	0	0	0	0	0	-325	0	0	-441	0		
	17NB-13 PM Grth Fctr (%)			0	0	0	0	0	0	0	-22%	0	0	-21%	0		
	2017 NB = Exist x Grth Fctr										940			1372			
	Diff check GF- Abs (<50 OK)			0							**58**			**70**			
	Average Existing value & GF Decrease										1074			1558			
	Rounded No-Build Volumes		NO SIGNAL IN 2017	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1075**	**0**	**0**	**1550**	**0**		
57	Fairfax Cnty Pky NB - SB		Kingman Rd														
	Existing Vol			2	714	51	266	938	3	18	10	23	567	3	1012		
	17NB-13 PM Pk Prd Delta			18	-2450	153	-260	-820	-26	58	4	-66	-882	11	891		
	17NB-13 PM Pk Hr (29.4%)			5	-720	45	-76	-241	-8	17	1	-19	-259	3	262		
	17NB-13 PM Grth Fctr (%)			27%	-77%	70%	-13%	-30%	-10%	12%	15%	-32%	-78%	79%	26%		
	2017 NB = Exist x Grth Fctr			3	161	87	231	657	3	20	12	16	123	5	1278		
	Diff check GF- Abs (<50 OK)			-5	**167**	-9	42	-40	7	-15	0	12	**-184**	-1	4		
	Average Existing value & GF Decrease				438												
	Average Existing value & Abs Decrease												437				
	Rounded No-Build Volumes			**0**	**450**	**90**	**225**	**650**	**0**	**20**	**10**	**20**	**450**	**10**	**1275**		

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	12/26/2013			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values													
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
	I-95 Ramps	Lorton Rd (W)														
58	Existing Vol		5	1	10	232	1	525	48	783	4	7	1524	245		
	17NB-13 PM Pk Prd Delta		0	0	0	168	0	-46	0	284	763	-696	765	0		
	17NB-13 PM Pk Hr (29.4%)		0	0	0	49	0	-14	0	83	224	-205	225	0		
	17NB-13 PM Grth Fctr (%)		0	0	0	92%		-2%	0	9%	153%	-60%	15%	0		
	17NB-13 PM Pk Hr (29.4%)	Corrected Column Placement	0	0	0	49	0	-14	224	83	0	0	225	-205		
	17NB-13 PM Grth Fctr (%)	Corrected Column Placement	0	0	0	92%	0	-2%	153%	9%	0	0	15%	-60%		
	2017 NB = Exist x Grth Fctr		5	1	10	446	1	513	121	856	4	7	1745	98		
	Diff check GF- Abs (<50 OK)		0	0	0	**164**	0	1	**-151**	-11	0	0	-4	**58**		
	Average GF & Abs values					364			197							
	Average Existing value & GF Decrease													172		
	Rounded No-Build Volumes		**10**	**0**	**10**	**375**	**0**	**525**	**200**	**850**	**10**	**10**	**1750**	**175**		
	I-95 Ramps	Lorton Rd (E)														
59	Existing Vol		43	19	36	106	9	100	236	700	13	251	1702	31		
	17NB-13 PM Pk Prd Delta		0	0	0	871	0	-216	0	442	10	38	285	0		
	17NB-13 PM Pk Hr (29.4%)		0	0	0	256	0	-63	0	130	3	11	84	0		
	17NB-13 PM Grth Fctr (%)		0	0	0	92%		-23%	0	22%	1%	3%	5%	0		
	17NB-13 PM Pk Hr (29.4%)	Corrected Column Placement	0	0	0	256	0	-63	3	130	0	0	84	11		
	17NB-13 PM Grth Fctr (%)	Corrected Column Placement	0	0	0	92%	0	-23%	1%	22%	0	0	5%	3%		
	2017 NB = Exist x Grth Fctr		43	19	36	204	9	77	238	854	13	251	1790	32		
	Diff check GF- Abs (<50 OK)		0	0	0	**-158**	0	40	-1	24	0	0	4	-10		
	Average GF & Abs values					283										
	Rounded No-Build Volumes		**40**	**20**	**40**	**275**	**10**	**80**	**250**	**850**	**10**	**250**	**1800**	**30**		
	Route 1	Lorton Rd (T int)														
60	Existing Vol	Route 1 coded as N-S	18	670	0	27	2343	925	224	0	15	0	0	0		
60	17NB-13 PM Pk Prd Delta		-23	-723	0	0	-459	1102	1115	0	-50	0	0	0		
	17NB-13 PM Pk Hr (29.4%)		-7	-213	0	0	-135	324	328	0	-15	0	0	0		
	17NB-13 PM Grth Fctr (%)		-13%	-21%	0	0	-7%	26%	55%	0	-30%	0	0	0		
	2017 NB = Exist x Grth Fctr		16	528	0	27	2172	1167	348	0	11	0	0	0		
	Diff check GF- Abs (<50 OK)		4	**70**	0	0	-36	**-82**	**-204**	0	10	0	0	0		
	Average Existing value & GF Decrease			599												
	Average GF & Abs values							1208	450							
	Rounded No-Build Volumes		**20**	**600**	**0**	**30**	**2175**	**1200**	**450**	**0**	**10**	**0**	**0**	**0**		

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	12/26/2013					>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Route 1		**Pohick Rd (T int.)**												
61	**Existing Vol**		**Route 1 coded as E-W**	0	0	0	135	1	210	121	776	1	1	2991	313
	17NB-13 PM Pk Prd Delta			0	0	0	20	0	2	4	390	0	0	659	243
	17NB-13 PM Pk Hr (29.4%)			0	0	0	6	0	1	1	115	0	0	194	71
	17NB-13 PM Grth Fctr (%)			0	0	0	3%	0	1%	2%	7%	0	0	6%	15%
	2017 NB = Exist x Grth Fctr			0	0	0	139	1	211	123	834	1	1	3183	359
	Diff check GF- Abs (<50 OK)			0	0	0	-2	0	1	1	**-57**	0	0	-1	-26
	Average GF & Abs values										862				
	Rounded No-Build Volumes			**0**	**0**	**0**	**150**	**0**	**225**	**125**	**875**	**0**	**0**	**3175**	**350**
	Route 1		**Telegraph Rd**												
62	**Existing Vol**		**Route 1 coded as E-W**	16	20	14	68	232	1039	235	647	27	128	2170	31
	17NB-13 PM Pk Prd Delta			0	-21	28	101	-550	-1016	-81	484	7	-282	1918	15
	17NB-13 PM Pk Hr (29.4%)			0	-6	8	30	-162	-299	-24	142	2	-83	564	4
	17NB-13 PM Grth Fctr (%)			0	-26%	52%	183%	-57%	-18%	-4%	13%	12%	-47%	30%	12%
	2017 NB = Exist x Grth Fctr			16	15	21	193	101	851	227	734	30	68	2831	35
	Diff check GF- Abs (<50 OK)			0	1	-1	**95**	30	**111**	15	**-56**	1	23	**97**	-1
	Average GF & Abs values						145				761			2782	
	Average Existing value & GF Decrease								945						
	Rounded No-Build Volumes			**20**	**20**	**20**	**150**	**100**	**950**	**225**	**775**	**30**	**70**	**2775**	**40**
	Fairfax County Pkwy		**Route 1**												
63	**Existing Vol**		**Route 1 coded as E-W**	0	0	0	825	0	600	28	652	0	0	1701	610
	17NB-13 PM Pk Prd Delta			0	0	0	-1246	0	-522	0	614	0	0	2173	-2279
	17NB-13 PM Pk Hr (29.4%)			0	0	0	-366	0	-153	0	180	0	0	639	-670
	17NB-13 PM Grth Fctr (%)			0	0	0	-35%	0	-100%	0	16%	0	0	33%	-66%
	2017 NB = Exist x Grth Fctr			0	0	0	535	0	0	28	759	0	0	2269	207
	Diff check GF- Abs (<50 OK)			0	0	0	**77**	0	**-447**	0	**-73**	0	0	**-71**	**267**
	Average GF & Abs values										796			2304	
	Average Existing value & Abs Decrease								523						
	Average Existing value & GF Decrease						680								408
	Rounded No-Build Volumes			**0**	**0**	**0**	**675**	**0**	**525**	**30**	**800**	**0**	**0**	**2300**	**400**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
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	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
	Route 1		Pohick Rd (Tulley Gate)														
64	Existing Vol		Route 1 coded as E-W	758	27	16	85	10	13	4	1264	214	40	1554	79		
	17NB-13 PM Pk Prd Delta			-1001	0	1	0	0	0	0	-115	-517	1	894	0		
	17NB-13 PM Pk Hr (29.4%)			-294	0	0	0	0	0	0	-34	-152	0	263	0		
	17NB-13 PM Grth Fctr (%)			-27%	0	6%	0	0	0	0	-2%	-25%	6%	14%	0		
	2017 NB = Exist x Grth Fctr			556	27	17	85	10	13	4	1236	160	42	1778	79		
	Diff check GF- Abs (<50 OK)			**92**	0	1	0	0	0	0	6	**98**	2	-39	0		
	Average Existing value & GF Decrease			657								187					
	Rounded No-Build Volumes			**650**	**30**	**20**	**90**	**10**	**10**	**10**	**1250**	**200**	**40**	**1775**	**80**		
	Route 1 at Belvoir Rd		Original Synchro Coding US 1 N-S	0	1142	86	77	1337	0	0	0	0	477	0	346		
65	Existing Vol		Revised Cding to match mdl US 1 E-W	477	0	346	0	0	0	0	1142	86	77	1337	0		
	17NB-13 PM Pk Prd Delta			-176	32	-327	1762	61	518	230	-182	-163	-276	552	1077		
	17NB-13 PM Pk Hr (29.4%)			-52	9	-96	518	18	152	68	-54	-48	-81	162	317		
	17NB-13 PM Grth Fctr (%)			-31%	0	-20%	0	0	0	0	-4%	-29%	-23%	10%	0		
	2017 NB = Exist x Grth Fctr			330	0	276	0	0	0	0	1098	61	59	1468	0		
	Diff check GF- Abs (<50 OK)			**95**	9	-26	**518**	18	**152**	**68**	-9	-23	**-63**	31	**317**		
	Use Abs values for New movements		New Movement		9		518	18	152	68					317		
	Average Existing value & GF Decrease			404									68				
	Rounded No-Build Volumes			**400**	**10**	**275**	**525**	**20**	**150**	**70**	**1100**	**60**	**70**	**1475**	**325**		
66	Route 1 at Woodlawn Rd		Original Synchro Coding US 1 N-S														
	Existing Vol		Revised Coding to match model US 1 E-W	0	0	0	3	0	2	3	1527	0	0	1527	1		
	17NB-13 PM Pk Prd Delta			0	0	0	0	0	0	0	1252	0	0	1353	0		
	17NB-13 PM Pk Hr (29.4%)			0	0	0	0	0	0	0	368	0	0	398	0		
	17NB-13 PM Grth Fctr (%)			0	0	0	0	0	0	0	20%	0	0	20%	0		
	2017 NB = Exist x Grth Fctr			0	0	0	3	0	2	3	1830	0	0	1830	1		
	Diff check GF- Abs (<50 OK)			0	0	0	0	0	0	0	**65**	0	0	**95**	**0**		
	Average GF & Abs values										1863			1877			
	Rounded No-Build Volumes			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1875**	**0**	**0**	**1875**	**0**		

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	12/26/2013					>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
67	Mulligan Rd		Pole Rd								*Based on Gate Vols*					
	Existing Vol (No Signal)		Synthesized Vols frm Rt1 Vols	0	0	238	0	0	0	0	***400***	***111***	157	0	0	
	17NB-13 PM Pk Prd Delta			0	1996	165	986	2169	0	250	-803	-270	294	0	1228	
	17NB-13 PM Pk Hr (29.4%)			0	587	49	290	638	0	73	-236	-79	86	0	361	
	17NB-13 PM Grth Fctr (%)			0	0	0	0	0	0	0	-63%	-58%	1577%	0	0	
	2017 NB = Exist x Grth Fctr			0		238					147	47	2633			
	Diff check GF- Abs (<50 OK)		Not used at this location								17	-15	-2390			
	Use Abs values for New movements				587		290	638	0	73				0	361	
	Use Sum of existing and Abs Increase					287							243			
	Rounded No-Build Volumes		**No Signal**	**0**	**600**	**300**	**300**	**650**	**0**	**70**	**150**	**50**	**250**	**0**	**375**	
68	US Route 1		Mulligan Rd													
	Existing Vol			309	73	108	31	55	71	141	1201	305	53	957	24	
	17NB-13 PM Pk Prd Delta			302	803	-675	557	689	206	307	853	92	-476	845	337	
	17NB-13 PM Pk Hr (29.4%)			89	236	-199	164	203	61	90	251	27	-140	249	99	
	17NB-13 PM Grth Fctr (%)			26%	636%	-91%	451%	235%	24%	39%	19%	9%	-80%	18%		
	2017 NB = Exist x Grth Fctr			389	537	9	171	185	88	195	1428	333	11	1125	0	
	Diff check GF- Abs (<50 OK)			9	**-228**	**-100**	24	**73**	**43**	**36**	24	-1	**-98**	**80**	**123**	
	Average GF & Abs values				423			221	110	213				1165		
	Average Existing value & GF Decrease					59							32			
	Average existing + Abs Increase														74	
	Rounded No-Build Volumes			**400**	**425**	**60**	**175**	**225**	**100**	**225**	**1425**	**325**	**30**	**1175**	**80**	
69	Mount Vernon Highway		Mount Vernon Rd													
	Existing Vol			174	337	0	0	339	102	142	0	458	0	0	0	
	17NB-13 PM Pk Prd Delta			-130	710	0	0	437	-233	-416	0	86	0	0	0	
	17NB-13 PM Pk Hr (29.4%)			-38	209	0	0	128	-69	-122	0	25	0	0	0	
	17NB-13 PM Grth Fctr (%)			-17%	75%	0	0	42%	-35%	-51%	0	10%	0	0	0	
	2017 NB = Exist x Grth Fctr			145	588	0	0	483	66	70	0	506	0	0	0	
	Diff check GF- Abs (<50 OK)			-9	-43	0	0	-15	-33	-50	0	-22	0	0	0	
	Rounded No-Build Volumes			**150**	**600**	**0**	**0**	**475**	**70**	**70**	**0**	**500**	**0**	**0**	**0**	

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
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	12/24/2013						>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values												
Site	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
28	Franconia Springfld Pkwy		EB Exit Ramp to Rolling Rd				See Merge, Diverage and Weaving Volumes										
29	Franconia Springfld Pkwy		WB On Ramp from Rolling Rd				See Merge, Diverage and Weaving Volumes										
	Franconia Springfld Pkwy		Spring Village Dr														
30	Existing Volumes				25	4	104	103	8	80	29	1264	44	195	3385	82	
	17Alt1-13-PM Pk Pd Delta				-38	1	21	26	1	-11	20	-212	11	7	628	7	
	17Alt1-13 PM Pk Hr (29.4%)				-11	0	6	8	0	-3	6	-62	3	2	185	2	
	17Alt1-13 Alt1 Grth Fctr (%)				-18%	19%	7%	13%	20%	-6%	10%	-5%	6%	1%	6%	2%	
	2017 Alt1 = Exist x Grth Fctr				21	5	111	117	10	75	32	1206	46	198	3593	84	
	Diff check GF- Abs (<50 OK)				7	0	1	6	1	**-2**	-3	4	-1	1	23	**0**	
	Rounded Volumes				**20**	**10**	**125**	**125**	**10**	**80**	**30**	**1200**	**50**	**200**	**3600**	**90**	
	Franconia Springfld Pkwy		EB Exit & On Ramps at Backlick Rd														
31	Existing Volumes				263	1193	0	3	830	208	549	3	44	1	1	2	
	17Alt1-13-PM Pk Pd Delta				-160	-171	0	0	-654	1385	116	0	-1	0	0	0	
	17Alt1-13 PM Pk Hr (29.4%)				-47	-50	0	0	-192	407	34	0	0	0	0	0	
	17Alt1-13 Alt1 Grth Fctr (%)				-11%	-7%	0	0	-18%	**247%**	13%	0	-13%	0	0	0	
	2017 Alt1 = Exist x Grth Fctr				235	1111	0	3	680	722	620	3	38	1	1	2	
	Diff check GF- Abs (<50 OK)				19	-31	0	0	42	**106**	37	0	-5	0	0	**0**	
	Average Existing & Exist+Numerical Increase									412							
	Rounded Volumes				**225**	**1125**	**0**	**0**	**675**	**425**	**625**	**0**	**40**	**0**	**0**	**0**	
	Franconia Springfld Pkwy		WB Exit & On Ramps at Backlick Rd														
32	Existing Volumes				69	1660	1	7	811	1122	238	12	210	28	17	16	
	17Alt1-13-PM Pk Pd Delta				-3	-52	0	0	145	-663	-450	0	586.02	0	0	0	
	17Alt1-13 PM Pk Hr (29.4%)				-1	-15	0	0	43	-195	-132	0	172	0	0	0	
	17Alt1-13 Alt1 Grth Fctr (%)				-24%	-2%	0%	0%	4%	-19%	-32%	0%	63%	0%	0%		
	2017 Alt1 = Exist x Grth Fctr				52	1635	1	7	847	909	162	12	342	28	17	16	
	Diff check GF- Abs (<50 OK)				-16	-10	0	0	-6	-18	**57**	0	-40	0	0	0	
	Average Existing value & GF Decrease										200						
	Rounded Volumes				**50**	**1625**	**0**	**10**	**850**	**900**	**200**	**10**	**350**	**30**	**20**	**20**	

FORT BELVOIR TMP TRAFFIC ANALYSIS														
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12/24/2013			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)							
Actual values are displayed as whole numbers		Products are based on mutiplication of actual values												
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Franconia Springfld Pkwy	I-95 HOV ramps												
33	Existing Volumes		0	0	0	142	0	278	0	1283	313	420	2264	0
	17Alt1-13-PM Pk Pd Delta		0	0	0	439	0	1964	0	-51	996	984	-519	0
	17Alt1-13 PM Pk Hr (29.4%)		0	0	0	129	0	577	0	-15	293	289	-153	0
	17Alt1-13 Alt1 Grth Fctr (%)		0	0	0	31%	0	124%	0	-1%	169%	182%	-6%	0
	2017 Alt1 = Exist x Grth Fctr		0	0	0	185	0	623	0	1271	842	1183	2123	0
	Diff check GF- Abs (<50 OK)		0	0	0	**-86**	0	**-232**	**0**	3	**236**	**474**	11	0
	Average GF & Abs values					228		739			724	946		
	Rounded Volumes		**0**	**0**	**0**	**225**	**0**	**750**	**0**	**1275**	**725**	**950**	**2125**	**0**
	Franconia Springfld Pkwy	EB Exit & On Ramps at Frontier												
34	Existing Volumes		0	235	451	898	220	0	244	1	140	0	0	0
34	17Alt1-13-PM Pk Pd Delta			96	31	447	26		-1376	0	-7			
	17Alt1-13 PM Pk Hr (29.4%)		0	28	9	131	8	0	-405	0	-2	0	0	0
	17Alt1-13 Alt1 Grth Fctr (%)			34%	31%	27%	14%		-54%		-6%			
	2017 Alt1 = Exist x Grth Fctr		0	315	593	1142	252	0	111	0	132	0	0	0
	Diff check GF- Abs (<50 OK)		0	**52**	**132**	**113**	24	**0**	**272**	-1	-7	0	0	**0**
	Average GF & Abs values			289	526	1086								
	Average Existing value & GF Decrease								178					
	Rounded Volumes		**0**	**300**	**525**	**1100**	**250**	**0**	**175**	**0**	**125**	**0**	**0**	**0**
	Franconia Springfld Pkwy	WB Exit & On Ramps at Frontier												
35	Existing Volumes		512	535	0	0	1080	629	0	0	0	17	1	810
	17Alt1-13-PM Pk Pd Delta		48	-1329			455	-337				18	0	1362
	17Alt1-13 PM Pk Hr (29.4%)		14	-391	0	0	134	-99	0	0	0	5	0	401
	17Alt1-13 Alt1 Grth Fctr (%)		30%	-50%	0	0	26%	-9%	0	0	0	23%		85%
	2017 Alt1 = Exist x Grth Fctr		667	266	0	0	1361	575	0	0	0	21	0	1499
	Diff check GF- Abs (<50 OK)		**141**	**122**	0	0	**147**	45	0	0	0	-1	-1	**289**
	Average GF & Abs values		597				1287							1355
	Average Existing value & GF Decrease			401										
	Rounded Volumes		**600**	**400**	**0**	**0**	**1300**	**575**	**0**	**0**	**0**	**20**	**0**	**1350**

FORT BELVOIR TMP TRAFFIC ANALYSIS													
2017 Alt1 PM Traffic Volume Computations		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)										
12/24/2013			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
	Franconia Springfld Pkwy	**Beulah St.**												
36	**Existing Volumes**		553	434	173	309	473	307	368	1205	631	158	1078	132
	17Alt1-13-PM Pk Pd Delta		829	-335	-56	9	-798	1004	812	414	1023	-587	301	-13
	17Alt1-13 PM Pk Hr (29.4%)		244	-98	-16	3	-235	295	239	122	301	-172	88	-4
	17Alt1-13 Alt1 Grth Fctr (%)		33%	-18%	-9%	7%	-27%	134%	73%	15%	43%	-43%	9%	-16%
	2017 Alt1 = Exist x Grth Fctr		737	356	157	330	347	718	637	1390	901	91	1180	111
	Diff check GF- Abs (<50 OK)		**-60**	21	0	19	**109**	**116**	31	**63**	-30	**105**	13	-17
	Average GF & Abs values		767					660		1358				
	Average Existing value & GF Decrease						410					124		
	Rounded Volumes		**775**	**350**	**150**	**325**	**400**	**650**	**650**	**1350**	**900**	**125**	**1175**	**125**
37	**Fairfax Cnty Pky N-S**	**On Ramp loop frm SB Barta**	**See Merge, Diverage and Weaving Volumes**											
	Fairfax Cnty Pky SB	**SB Exit Ramp at Barta Rd**												
38	**Realigned Existing Volumes**		0	0	0	22	0	580	0	461	0	1	409	0
	17Alt1-13-PM Pk Pd Delta		0	0	0	40	0	-193	0	573	0	0	-298	0
	17Alt1-13 PM Pk Hr (29.4%)		0	0	0	12	0	-57	0	168	0	0	-88	0
	17Alt1-13 Alt1 Grth Fctr (%)		0	0	0	11%	0	-8%	0	79%	0	0	-60%	0
	2017 Alt1 = Exist x Grth Fctr		0	0	0	24	0	531	0	827	0	1	165	0
	Diff check GF- Abs (<50 OK)		0	0	0	-9	0	8	0	**198**	0	0	**-157**	0
	Average GF & Abs values									728				
	Average Existing value & Abs Decrease												365	
	Rounded Volumes		**0**	**0**	**0**	**30**	**0**	**525**	**0**	**725**	**0**	**0**	**375**	**0**
38a	**Fairfax Cnty Pky SB**	**Barta Rd Exit Ramp**	**See Merge, Diverage and Weaving Volumes**											
	Fairfax Cnty Pky NB	**NB Exit Ramp at Barta Rd**												
39	**Realigned Existing Volumes**		270	0	16	0	0	0	0	38	0	0	361	0
	17Alt1-13-PM Pk Pd Delta		-84	0	0				0	39			-224	-10
	17Alt1-13 PM Pk Hr (29.4%)		-25	0	0	0	0	0	0	12	0	0	-66	-3
	17Alt1-13 Alt1 Grth Fctr (%)		-100%	0	7%	0	0	0	0	10%	0	0	-35%	-1%
	2017 Alt1 = Exist x Grth Fctr		0	0	17	0	0	0	0	42	0	0	235	0
	Diff check GF- Abs (<50 OK)		**-245**	0	1	0	0	0	0	-8	0	0	**-61**	3
	Average Existing value & Abs Decrease		258										328	
	Rounded Volumes		**250**	**0**	**20**	**0**	**0**	**0**	**0**	**40**	**0**	**0**	**325**	**0**
39a	**Fairfax Cnty Pky NB**	**Barta Rd On Ramp**	**See Merge, Diverage and Weaving Volumes**											

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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12/24/2013				>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)									
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values													
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
40	Fairfax Cnty Pky NB	On Ramp loop frm NB Barta Rd	See Merge, Diverage and Weaving Volumes													
41	Fairfax Cnty Pky SB	Weaving area - Barta to Boudinot	See Merge, Diverage and Weaving Volumes													
	Backlick Rd N-S	Barta Rd														
42	Existing Vol		19	793	0	0	814	36	659	0	91	0	0	0		
	17Alt1-13-PM Pk Pd Delta		6	-185			-568	-58	-141		-364					
	17Alt1-13 PM Pk Hr (29.4%)		2	-54	0	0	-167	-17	-41	0	-107	0	0	0		
	17Alt1-13 Alt1 Grth Fctr (%)		1%	-11%	0	0	-25%	-4%	-6%	0	-76%	0	0	0		
	2017 Alt1 = Exist x Grth Fctr		19	708	0	0	611	34	620	0	22	0	0	0		
	Diff check GF- Abs (<50 OK)		-1	-31	0	0	-36	16	2	0	38	0	0	0		
	Rounded Volumes		20	700	0	0	625	40	625	0	20	0	0	0		
43	I-95 SB HOT Lanes	Merge from North Area On-Ramp	See Merge, Diverage and Weaving Volumes													
44	Fairfax Cnty Pky NB	Weaving area - bet 95 Ramp to Boudinot	See Merge, Diverage and Weaving Volumes													
45a	Fairfax Cnty Pky SB	Weaving - 95 SB Exit Ramp to 95 NB On Ramp	See Merge, Diverage and Weaving Volumes													
45b	Fairfax Cnty Pky NB	Weaving - 95 NB Exit Ramp to 95 SB On Ramp	See Merge, Diverage and Weaving Volumes													
	Fairfax Cnty Pky N-S	Loisdale Rd														
46	Existing Vol		0	1916	114	156	1469	754	0	96	133	243	0	652		
	17Alt1-13-PM Pk Pd Delta			-42	-61	-42	-111		0	-52	-15	-359		234		
	17Alt1-13 PM Pk Hr (29.4%)		0	-12	-18	-12	-33	0	0	-15	-4	-105	0	69		
	17NB-13 Alt1 Grth Fctr (%)		0	-1%	-14%	-5%	-2%	0	0	-20%	-6%	-36%	0	15%		
	2017 Alt1 = Exist x Grth Fctr		0	1903	98	148	1433	754	0	77	125	156	0	749		
	Diff check GF- Abs (<50 OK)		0	0	2	5	-4	0	0	-4	-4	18	0	29		
	Rounded Volumes		0	1900	100	150	1425	750	0	80	125	150	0	750		

FORT BELVOIR TMP TRAFFIC ANALYSIS													
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Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Fairfax Cnty Pkwy N-S	**Terminal Rd**												
47	**Existing Vol**		21	1634	8	56	1563	87	305	9	117	28	10	126
	17Alt1-13-PM Pk Pd Delta		10	-206	0	0	-478	-7	39	0	-132	29	0	63
	17Alt1-13 PM Pk Hr (29.4%)		3	-61	0	0	-140	-2	12	0	-39	8	0	18
	17Alt1-13 Alt1 Grth Fctr (%)		6%	-4%	0	0	-10%	-1%	4%	0	-20%	0	0	0
	2017 Alt1 = Exist x Grth Fctr		22	1575	8	56	1412	86	316	9	94	28	10	126
	Diff check GF- Abs (<50 OK)		-2	2	0	0	-10	1	0	0	15	-8	0	-18
	Rounded Volumes		**20**	**1575**	**10**	**60**	**1425**	**90**	**325**	**10**	**100**	**30**	**10**	**125**
	Fairfax Cnty Pkwy N-S	**750' south of Terminal Rd**												
48	**Existing Vol**		0	1594	82	36	1647	0	0	0	0	102	0	98
	17Alt1-13-PM Pk Pd Delta			-285	-28	-4	-577					-194		89
	17Alt1-13 PM Pk Hr (29.4%)		0	-84	-8	-1	-170	0	0	0	0	-57	0	26
	17Alt1-13 Alt1 Grth Fctr (%)		0	-5%	-23%	-1%	-11%	0	0	0	0	-30%	0	16%
	2017 Alt1 = Exist x Grth Fctr		0	1509	64	36	1464	0	0	0	0	71	0	114
	Diff check GF- Abs (<50 OK)		0	-1	-10	1	-14	0	0	0	0	26	0	-10
	Rounded Volumes		**0**	**1500**	**70**	**40**	**1475**	**0**	**0**	**0**	**0**	**70**	**0**	**125**
	Telegraph Rd E-W	**Hayfield Rd**												
49	Existing Vol		22	51	27	256	87	191	350	665	40	29	480	104
	17Alt1-13-PM Pk Pd Delta		0	-49	-10	-89	-84	1114	888	353	0	18	-148	4
	17Alt1-13 PM Pk Hr (29.4%)		0	-14	-3	-26	-25	327	261	104	0	5	-44	1
	17Alt1-13 Alt1 Grth Fctr (%)		0%	-12%	-6%	-84%	-15%	171%	74%	23%	0	7%	-8%	20%
	2017 Alt1 = Exist x Grth Fctr		22	45	25	41	74	518	609	816	40	31	443	125
	Diff check GF- Abs (<50 OK)		0	8	1	**-189**	11	-1	-2	47	0	-3	7	20
	Average Existing value & Abs Decrease					243								
	Rounded Volumes		**20**	**50**	**30**	**250**	**80**	**525**	**600**	**825**	**40**	**30**	**450**	**125**
50	**Telegraph Rd E-W**	**Mulligan Rd**	Synthesized East West volumes based on Telegraph at DCEETA											
	Existing Vol		0	0	0	0	0	0	0	830	0	0	932	0
	17Alt1-13-PM Pk Pd Delta		2158	0	1559	0	0	0	0	-246	1577	1552	-522	0
	17Alt1-13 PM Pk Hr (29.4%)		634	0	458	0	0	0	0	-72	464	456	-153	0
	17Alt1-13 Alt1 Grth Fctr (%)									-14%			-25%	
	2017 Alt1 = Exist x Grth Fctr		634	0	458	0	0	0	0	714	464	456	702	0
	Diff check GF- Abs (<50 OK)									-44			**-76**	
	Average Existing value & Abs Decrease									794			855	
	Rounded Volumes		**625**	**0**	**450**	**0**	**0**	**0**	**0**	**800**	**475**	**450**	**850**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
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	12/24/2013						>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values												
Site	Road Name			Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
	Telegraph Rd E-W			Road B (DCEETA)													
51	Existing Vol				359	0	61	1	0	1	8	768	28	6	925	1	
	17Alt1-13-PM Pk Pd Delta				-91		140					1191	-60	118	1518		
	17Alt1-13 PM Pk Hr (29.4%)				-27	0	41	0	0	0	0	350	-18	35	446	0	
	17Alt1-13 Alt1 Grth Fctr (%)				-9%	0	62%	0	0	0	0	77%	-11%	86%	77%	0	
	2017 Alt1 = Exist x Grth Fctr				327	0	99	1	0	1	8	1363	25	11	1634	1	
	Diff check GF- Abs (<50 OK)				-5	0	-3	**0**	0	0	0	**245**	14	-29	**262**	0	
	Average GF & Abs values											1240			1502		
	Rounded Volumes				**325**	**0**	**100**	**0**	**0**	**0**	**10**	**1250**	**30**	**10**	**1500**	**0**	
	Telegraph Rd E-W			Beulah St													
52	**Existing Vol**				64	478	263	101	161	448	326	422	10	81	802	256	
	17Alt1-13-PM Pk Pd Delta				32	-201	-32	1206	-183	-997	-669	-43	55	-245	164	1508	
	17Alt1-13 PM Pk Hr (29.4%)				9	-59	-9	355	-54	-293	-197	-13	16	-72	48	443	
	17Alt1-13 Alt1 Grth Fctr (%)				0	-13%	-15%	439%	-13%	-34%	-32%	-3%	0	-70%	8%	263%	
	2017 Alt1 = Exist x Grth Fctr				64	414	224	544	140	294	223	410	10	24	865	928	
	Diff check GF- Abs (<50 OK)				-9	-5	-30	**88**	33	**139**	**94**	1	-16	15	15	**229**	
	Average Existing and Abs values							278								478	
	Average Existing value & GF Decrease									371	275						
	Rounded Volumes				**70**	**425**	**225**	**275**	**150**	**375**	**275**	**400**	**10**	**30**	**875**	**475**	
	Telegraph Rd			Newington Rd													
				Original Coding from Synchro	0	0	0	150	0	34	76	596	0	2	1062	155	
53	**Existing Vol**			Telegraph N-S Revised coding to match mo	76	596	0	2	1062	155	150	0	34	0	0	0	
	17Alt1-13-PM Pk Pd Delta				-184	-726			-1414	613	68		0				
	17Alt1-13 PM Pk Hr (29.4%)				-54	-213	0	0	-416	180	20	0	0	0	0	0	
	17Alt1-13 Alt1 Grth Fctr (%)				-96%	-28%	0	0	-33%	96%	6%	0	-3%	0	0	0	
	2017 Alt1 = Exist x Grth Fctr				3	431	0	2	716	304	160	0	33	0	0	0	
	Diff check GF- Abs (<50 OK)				-19	48	0	0	**70**	-31	-11	0	-1	0	0	0	
	Average Existing value & GF Decrease								889								
	Rounded Volumes				**10**	**425**	**0**	**0**	**900**	**300**	**150**	**0**	**30**	**0**	**0**	**0**	

FORT BELVOIR TMP TRAFFIC ANALYSIS														
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12/24/2013			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)							
Actual values are displayed as whole numbers		Products are based on mutiplication of actual values												
Site	**Road Name**	**Road Name**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
	Fairfax Cnty Pkwy SB Ramps	**Telegraph Rd (S)**												
54	**Existing Vol**		0	0	0	184	1	590	0	427	31	138	1190	0
	17Alt1-13-PM Pk Pd Delta		0	0	0	7	0	-321	0	68	-84	-326	-943	0
	17Alt1-13 PM Pk Hr (29.4%)		0	0	0	2	0	-94	0	20	-25	-96	-277	0
	17Alt1-13 Alt1 Grth Fctr (%)		0	0	0	4%	0	-19%	0	3%	-13%	-81%	-18%	0
	2017 Alt1 = Exist x Grth Fctr		0	0	0	191	1	476	0	440	27	26	976	0
	Diff check GF- Abs (<50 OK)		0	0	0	5	0	-20	0	-7	21	-16	**63**	0
	Average Existing value & GF Decrease												1083	
	Rounded Volumes		**0**	**0**	**0**	**200**	**0**	**475**	**0**	**450**	**30**	**30**	**1075**	**0**
54a	**Fairfax Cnty Pky SB**	**Exit Ramp to Telegraph Rd**	**See Merge, Diverage and Weaving Volumes**											
54b	**Fairfax Cnty Pky SB**	**On Ramp from Telegraph Rd**	**See Merge, Diverage and Weaving Volumes**											
	Fairfax Cnty Pkwy NB Ramps	**Telegraph Rd (N)**												
55	**Existing Vol**		307	28	198	0	0	0	119	491	0	0	1031	87
	17Alt1-13-PM Pk Pd Delta		407	0	-807	0	0	0	23	53	0	0	-1676	159
	17Alt1-13 PM Pk Hr (29.4%)		120	0	-237	0	0	0	7	15	0	0	-493	47
	17Alt1-13 Alt1 Grth Fctr (%)		40%	0	-81%	0	0	0	7%	3%	0	0	-36%	135%
	2017 Alt1 = Exist x Grth Fctr		430	28	37	0	0	0	127	503	0	0	657	204
	Diff check GF- Abs (<50 OK)		3	0	**76**	0	0	0	2	-3	0	0	**119**	**71**
	Average Existing value & GF Decrease				117								844	
	Average GF & Abs values													169
	Rounded Volumes		**425**	**30**	**125**	**0**	**0**	**0**	**125**	**500**	**0**	**0**	**850**	**175**
55a	**Fairfax Cnty Pky NB**	**On Ramp from Telegraph Rd**	**See Merge, Diverage and Weaving Volumes**											
55b	**Fairfax Cnty Pky NB**	**Exit Ramp to Telegraph Rd**	**See Merge, Diverage and Weaving Volumes**											

FORT BELVOIR TMP TRAFFIC ANALYSIS																
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	12/24/2013				>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)							
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values												
Site	Road Name		Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
56	Fairfax Cnty Pky NB - SB		Ehlers Rd	Synthesize from Kingman - No Signal												
	Existing Vol			0	0	0	0	0	0	0	1207	0	0	1744	0	
	17Alt1-13-PM Pk Pd Delta										-867			-894		
	17Alt1-13 PM Pk Hr (29.4%)			0	0	0	0	0	0	0	-255	0	0	-263	0	
	17Alt1-13 Alt1 Grth Fctr (%)										-17%			-13%		
	2017 Alt1 = Exist x Grth Fctr										998			1523		
	Diff check GF- Abs (<50 OK)			0							46			41		
	Average Existing value & GF Decrease										1102			1633		
	Rounded Volumes		NO SIGNAL IN 2017	0	0	0	0	0	0	0	1100	0	0	1625	0	
57	Fairfax Cnty Pky NB - SB		Kingman Rd													
	Existing Vol			2	714	51	266	938	3	18	10	23	567	3	1012	
	17Alt1-13-PM Pk Pd Delta			36	-2500	268	-194	-704	29	184	10	-28	-1004	22	1407	
	17Alt1-13 PM Pk Hr (29.4%)			11	-735	79	-57	-207	8	54	3	-8	-295	6	414	
	17Alt1-13 Alt1 Grth Fctr (%)			54%	-79%	122%	-10%	-26%	11%	38%	43%	-14%	-89%	159%	42%	
	2017 Alt1 = Exist x Grth Fctr			3	150	113	240	697	3	25	14	20	62	8	1432	
	Diff check GF- Abs (<50 OK)			-9	**171**	-16	31	-34	-8	-47	1	5	**-210**	-2	7	
	Average Existing value & GF Decrease				432											
	Average Existing value & Abs Decrease												419			
	Rounded Volumes			0	425	125	250	700	0	30	20	20	425	10	1425	
	I-95 Ramps		Lorton Rd (W)													
58	Existing Vol			5	1	10	232	1	525	48	783	4	7	1524	245	
	17Alt1-13-PM Pk Pd Delta						169	0	-73		294	752	-741	908		
	17Alt1-13 PM Pk Hr (29.4%)						50	0	-21		86	221	-218	267		
	17Alt1-13 Alt1 Grth Fctr (%)						93%		-4%		10%	151%	-64%	17%		
	2017 Alt1 = Exist x Grth Fctr		Corrected Column Placement	0	0	0	50	0	-21	221	86	0	0	267	-218	
	17Alt1-13-PM%		Corrected Column Placement	0	0	0	93%	0	-4%	151%	10%	0	0	17%	-64%	
	2017 Alt 1 w/ Growth fctrs			5	1	10	447	1	506	120	858	4	7	1787	89	
	Diff check GF- Abs (<50 OK)			0	0	0	**166**	0	2	**-149**	-11	0	0	-4	62	
	Average GF & Abs values						365			195						
	Average Existing value & GF Decrease														167	
	Rounded Volumes			10	0	10	375	0	500	200	850	10	10	1800	175	

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
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	12/24/2013							>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers					Products are based on mutiplication of actual values											
Site	Road Name			Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	I-95 Ramps			Lorton Rd (E)													
59	Existing Vol					43	19	36	106	9	100	236	700	13	251	1702	31
	17Alt1-13-PM Pk Pd Delta								893	0	-256		461	2	37	423	
	17Alt1-13 PM Pk Hr (29.4%)					0	0	0	262	0	-75		136	1	11	124	
	17Alt1-13 Alt1 Grth Fctr (%)					0	0	0	94%		-27%		23%	0%	3%	8%	
	17Alt1-13 PM P inc 29.4%			Corrected Column Placement		0	0	0	262	0	-75	1	136	0	0	124	11
	17NB-13 Alt1 Grth Fctr (%)			Corrected Column Placement		0	0	0	94%	0	-27%	0%	23%	0	0	8%	3%
	2017 Alt 1 w/ Growth fctrs					43	19	36	206	9	73	236	861	13	251	1833	32
	Diff check GF- Abs (<50 OK)					0	0	0	**-162**	0	48	0	25	0	0	7	-10
	Average GF & Abs values								287								
	Rounded Volumes					**40**	**20**	**40**	**300**	**10**	**70**	**250**	**875**	**10**	**250**	**1825**	**30**
	Route 1			**Lorton Rd (T int)**													
60	**Existing Vol**			**Route 1 coded as N-S**		18	670	0	27	2343	925	224	0	15	0	0	0
	17Alt1-13-PM Pk Pd Delta					-24	-731	0	0	-411	1221	1156	0	-51	0	0	0
	17Alt1-13 PM Pk Hr (29.4%)					-7	-215	0	0	-121	359	340	0	-15	0	0	0
	17Alt1-13 Alt1 Grth Fctr (%)					-14%	-22%	0	0	-7%	29%	57%	0	-30%	0	0	0
	2017 Alt1 = Exist x Grth Fctr					15	526	0	27	2190	1194	353	0	10	0	0	0
	Diff check GF- Abs (<50 OK)					5	**71**	0	0	-32	**-90**	**-211**	0	10	0	0	0
	Average Existing value & GF Decrease						598										
	Average GF & Abs values										1239	458					
	Rounded Volumes					**20**	**600**	**0**	**30**	**2200**	**1250**	**450**	**0**	**10**	**0**	**0**	**0**
	Route 1			Pohick Rd (T int.)													
61	Existing Vol			Route 1 coded as E-W		0	0	0	135	1	210	121	776	1	1	2991	313
	17Alt1-13-PM Pk Pd Delta	26	Route 1 EW		Pohick Rd (T)	0	0	0	49	0	1	3	425	0	0	827	277
	17Alt1-13 PM Pk Hr (29.4%)	26	Route 1 EW		Pohick Rd (T)	0	0	0	14	0	0	1	125	0	0	243	81
	17Alt1-13 Alt1 Grth Fctr (%)	26	Route 1		Pohick Rd (T)	0	0	0	6%	0	0%	1%	8%	0	0	8%	17%
	2017 Alt1 = Exist x Grth Fctr					0	0	0	144	1	211	122	839	1	1	3232	365
	Diff check GF- Abs (<50 OK)					0	0	0	-6	0	0	1	**-62**	0	0	-2	-30
	Average GF & Abs values												870				
	Rounded Volumes					**0**	**0**	**0**	**150**	**0**	**225**	**125**	**875**	**0**	**0**	**3225**	**375**

FORT BELVOIR TMP TRAFFIC ANALYSIS													
2017 Alt1 PM Traffic Volume Computations		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)										
12/24/2013			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	Road Name	Road Name	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Route 1	**Telegraph Rd**												
62	**Existing Vol**	**Route 1 coded as E-W**	16	20	14	68	232	1039	235	647	27	128	2170	31
	17Alt1-13-PM Pk Pd Delta		0	-13	21	101	-472	-860	7	472	-4	-171	1963	15
	17Alt1-13 PM Pk Hr (29.4%)		0	-4	6	30	-139	-253	2	139	-1	-50	577	4
	17Alt1-13 Alt1 Grth Fctr (%)		0	-16%	39%	183%	-49%	-15%	0%	13%	-7%	-28%	31%	12%
	2017 Alt1 = Exist x Grth Fctr		16	17	20	192	119	880	236	731	25	92	2846	35
	Diff check GF- Abs (<50 OK)		0	1	-1	**95**	26	**94**	-1	**-54**	-1	14	**99**	-1
	Average GF & Abs values					145				758			2797	
	Average Existing value & GF Decrease							960						
	Rounded Volumes		**20**	**20**	**20**	**150**	**125**	**950**	**250**	**750**	**30**	**90**	**2800**	**40**
	Fairfax County Pkwy	**Route 1**												
63	**Existing Vol**	**Route 1 coded as E-W**	0	0	0	825	0	600	28	652	0	0	1701	610
	17Alt1-13-PM Pk Pd Delta		0	0	0	-1227		-509	0	594	0	0	2316	-2196
	17Alt1-13 PM Pk Hr (29.4%)		0	0	0	-361	0	-150	0	175	0	0	681	-646
	17Alt1-13 Alt1 Grth Fctr (%)		0	0	0	-35%	0	-97%	0	16%	0	0	36%	-64%
	2017 Alt1 = Exist x Grth Fctr		0	0	0	540	0	15	28	756	0	0	2306	222
	Diff check GF- Abs (<50 OK)		0	0	0	**76**	0	**-435**	0	**-71**	0	0	**-75**	**257**
	Average GF & Abs values									791			2344	
	Average Existing value & Abs Decrease							525						
	Average Existing value & GF Decrease					682								416
	Rounded Volumes		**0**	**0**	**0**	**675**	**0**	**525**	**30**	**800**	**0**	**0**	**2350**	**425**
	Route 1	**Pohick Rd (Tulley Gate)**												
64	**Existing Vol**	**Route 1 coded as E-W**	758	27	16	85	10	13	4	1264	214	40	1554	79
	17Alt1-13-PM Pk Pd Delta		-812	0	1	0	0	0	0	-337	-297	1	932	0
	17Alt1-13 PM Pk Hr (29.4%)		-239	0	0	0	0	0	0	-99	-87	0	274	0
	17Alt1-13 Alt1 Grth Fctr (%)		-22%	0	6%	0	0	0	0	-6%	-15%	6%	15%	0
	2017 Alt1 = Exist x Grth Fctr		594	27	17	85	10	13	4	1183	183	42	1787	79
	Diff check GF- Abs (<50 OK)		**75**	0	1	0	0	0	0	18	**56**	2	-40	0
	Average Existing value & GF Decrease		676								198			
	Rounded Volumes		**675**	**30**	**20**	**90**	**10**	**10**	**10**	**1175**	**200**	**40**	**1800**	**80**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
		2017 Alt1 PM Traffic Volume Computations				**Rounding Rules:**		**"1 to 99 Rnd to 10x (up if >d3)**									
		12/24/2013						**>100 Rnd to 25x (up if >25+10)**				**>100 Rnd to 25x (down if<25+11)**					
		Actual values are displayed as whole numbers				**Products are based on mutiplication of actual values**											
Site		**Road Name**		**Road Name**		**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
		Route 1 at Belvoir Rd		**Original Synchro Coding US 1 N-S**		0	1142	86	77	1337	0	0	0	0	477	0	346
65		**Existing Vol**		**Revised Cding to match mdl US 1 E-W**		477	0	346	0	0	0	0	1142	86	77	1337	0
		17Alt1-13-PM Pk Pd Delta				-175	35	-253	2259	80	609	250	-411	-175	-259	499	1166
		17Alt1-13 PM Pk Hr (29.4%)				-51	10	-75	664	23	179	73	-121	-51	-76	147	343
		17Alt1-13 Alt1 Grth Fctr (%)				-31%	0	-16%	0	0	0	0	-9%	-31%	-22%	9%	0
		2017 Alt1 = Exist x Grth Fctr				331	0	291	0	0	0	0	1042	59	60	1455	0
		Diff check GF- Abs (<50 OK)				**95**	10	-20	**664**	23	**179**	**73**	-21	-24	**-59**	28	**343**
		Use Abs values for New movements			New Movement		10		664	23	179	73					343
		Average Existing value & GF Decrease				404									69		
		Rounded Volumes				**400**	**10**	**300**	**675**	**20**	**175**	**70**	**1050**	**60**	**70**	**1450**	**350**
66		**Route 1 at Woodlawn Rd**															
		Existing Vol		**Revised Coding to match model US 1 E-W**		0	0	0	3	0	2	3	1527	0	0	1527	1
		17Alt1-13-PM Pk Pd Delta				0	0	0	0	0	0	0	1595	0	0	1406	0
		17Alt1-13 PM Pk Hr (29.4%)				0	0	0	0	0	0	0	469	0	0	413	0
		17Alt1-13 Alt1 Grth Fctr (%)				0	0	0	0	0	0	0	25%	0	0	21%	0
		2017 Alt1 = Exist x Grth Fctr				0	0	0	3	0	2	3	1913	0	0	1841	1
		Diff check GF- Abs (<50 OK)				0	0	0	0	0	0	0	**83**	0	0	**99**	**0**
		Average GF & Abs values											1955			1891	
		Rounded Volumes				**0**	**0**	**0**	**10**	**0**	**0**	**0**	**1950**	**0**	**0**	**1900**	**0**
67		**Mulligan Rd**		**Pole Rd**									Revised 12/18/13				
		Existing Vol (No Signal)		**Synthesized Vols frm Rt1 Vols**		0	0	238	0	0	0	0	400	111	157	0	0
		17Alt1-13-PM Pk Pd Delta				0	2148	190	1012	2117	0	332	-784	-239	312	0	1237
		17Alt1-13 PM Pk Hr (29.4%)				0	631	56	298	622	0	98	-231	-70	92	0	364
		17Alt1-13 Alt1 Grth Fctr (%)						23%					-62%	-51%	36%		
		2017 Alt1 = Exist x Grth Fctr				0		294					153	54	214		
		Diff check GF- Abs (<50 OK)		Not used at this location									16	-13			
		Use Abs values for New movements					631		**298**	622	**0**	**98**				0	**364**
		Rounded Volumes		**Mulligan NS**	**Pole No Signal??**	**0**	**625**	**300**	**300**	**625**	**0**	**100**	**150**	**60**	**225**	**0**	**375**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
		2017 Alt1 PM Traffic Volume Computations				**Rounding Rules:**		**"1 to 99 Rnd to 10x (up if >d3)**									
		12/24/2013						**>100 Rnd to 25x (up if >25+10)**				**>100 Rnd to 25x (down if<25+11)**					
		Actual values are displayed as whole numbers				**Products are based on mutiplication of actual values**											
Site		**Road Name**		**Road Name**		**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
68		**US Route 1**		**Mulligan Rd**													
		Existing Vol				309	73	108	31	55	71	141	1201	305	53	957	24
		17Alt1-13-PM Pk Pd Delta				276	814	-658	531	673	243	476	978	141	-482	887	339
		17Alt1-13 PM Pk Hr (29.4%)				81	239	-193	156	198	71	140	288	41	-142	261	100
		17Alt1-13 Alt1 Grth Fctr (%)				24%	645%	-89%	430%	230%	28%	60%	22%	14%	-81%	18%	
		2017 Alt1 = Exist x Grth Fctr				382	544	12	164	182	91	225	1461	348	10	1133	0
		Diff check GF- Abs (<50 OK)				8	**-231**	**-97**	23	**71**	**51**	**56**	28	-2	**-99**	**84**	124
		Average GF & Abs values					428			217	117	253				1176	
		Average Existing value & GF Decrease						60							32		
		Average existing + Abs Increase															74
		Rounded Volumes				**375**	**425**	**60**	**175**	**225**	**125**	**250**	**1475**	**350**	**30**	**1175**	**80**
69		**Mount Vernon Highway**		**Mount Vernon Rd**													
		Existing Vol				174	337	0	0	339	102	142	0	458	0	0	0
		17Alt1-13-PM Pk Pd Delta				-99	675	0	0	469	-242	-378	0	135	0	0	0
		17Alt1-13 PM Pk Hr (29.4%)				-29	198	0	0	138	-71	-111	0	40	0	0	0
		17Alt1-13 Alt1 Grth Fctr (%)				-13%	71%	0	0	45%	-36%	-46%	0	16%	0	0	0
		2017 Alt1 = Exist x Grth Fctr				152	576	0	0	493	65	76	0	533	0	0	0
		Diff check GF- Abs (<50 OK)				-7	-40	0	0	-16	-34	-46	0	-35	0	0	0
		Rounded Volumes				**150**	**575**	**0**	**0**	**500**	**70**	**80**	**0**	**525**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																
	2017 Alternative 2 - AM Traffic Volume Computations at Selected Locations															
				Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)										
	12/31/2013					>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)						
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values													
Site	Road Name	Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Fairfax Cnty Pkwy N-S	Terminal Rd													
47	Existing Vol			62	1326	14	63	2606	307	114	4	23	8	7	38
	17Alt2-13 AM Pk Prd Delta			-3.95	-415	46.05	124.83	87.17	-162.6	5.95	0	0.02	0	0	0
	17Alt2-13 AM Pk Hr (41.7%)			-2	-173	19	52	36	-68	2	0	0	0	0	0
	17Alt2-13 AM Grth Fctr (%)			-2%	-16%	95%	59%	2%	-14%	1%	0%	0%	0%	0%	0%
	2017 Alt2 w/ Growth fctrs			61	1119	27	100	2661	263	115	4	23	8	7	38
	Diff check GF- Abs (<50 OK)			1	-34	-6	-15	19	23	-1	0	0	0	0	0
	Alt2 Rounded Volumes			60	1125	30	100	2675	275	125	10	20	10	10	40
57	Fairfax Cnty Pky NB - SB	Kingman Rd													
	Existing Vol			6	844	426	1350	984	27	3	6	4	39	3	158
	17Alt2-13 AM Pk Prd Delta			23	-854	-321	605	-1557	94	20	5	3	-160	2	52
	17Alt2-13 AM Pk Hr (41.7%)			10	-356	-134	252	-649	39	8	2	1	-67	1	22
	17Alt2-13 AM Grth Fctr (%)			33%	-37%	-93%	20%	-78%	20%	33%	75%	6%	-50%	38%	18%
	2017 Alt2 w/ Growth fctrs			8	535	29	1616	220	32	4	11	4	20	4	187
	Diff check GF- Abs (<50 OK)			-8	47	**-264**	14	**-115**	-34	-7	2	-1	**47**	0	7
	ABSDelt>%Delt	Average Exist & Exist*Delta%			689								29		
	ABSDelt<%Delt	Average Exist & (Exist+Delta)				359		659							
	Alt2 Rounded Volumes			10	700	350	1625	650	30	10	10	10	30	10	200
	Route 1	Lorton Rd (T int)													
60	Existing Vol	Route 1 coded as N-S		3	2503	0	7	562	145	737	0	15	0	0	0
	17Alt2-13 AM Pk Prd Delta			-3	-707	0	0	-216	499	1234	0	-12	0	0	0
	17Alt2-13 AM Pk Hr (41.7%)			-1	-295	0	0	-90	208	515	0	-5	0	0	0
	17Alt2-13 AM Grth Fctr (%)			-4%	-15%	0	0	-10%	112%	46%	0	-13%	0	0	0
	2017 Alt2 w/ Growth fctrs			3	2134	0	7	504	307	1078	0	13	0	0	0
	Diff check GF- Abs (<50 OK)			1	**-74**	0	0	32	-46	**-174**	0	3	0	0	0
	ABSDelt>%Delt	Average Exist & Exist*Delta%			2318										
	Use average of Difference and growth factors methods									**1165**					
	Alt2 Rounded Volumes			0	2325	0	10	500	300	1175	0	10	0	0	0

FORT BELVOIR TMP TRAFFIC ANALYSIS

2017 Alternative 3 - AM Traffic Volume Computations at Selected Locations

						Rounding Rules:		**"1 to 99 Rnd to 10x (up if >d3)**									
	12/31/2013							**>100 Rnd to 25x (up if >25+10)**				**>100 Rnd to 25x (down if<25+11)**					
Site	**Road Name**		**Road Name**			**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
	Fairfax Cnty Pkwy N-S		**Terminal Rd**														
47	**Existing Vol**					**62**	**1326**	**14**	**63**	**2606**	**307**	**114**	**4**	**23**	**8**	**7**	**38**
	17Alt3-13 AM Pk Prd Delta					-3.95	-415	46.05	124.83	87.17	-162.6	5.95	0	0.02	0	0	0
	17Alt3-13 AM Pk Hr (41.7%)					-2	-173	19	52	36	-68	2	0	0	0	0	0
	17Alt3-13 AM Grth Fctr (%)					-2%	-16%	95%	59%	2%	-14%	1%	0%	0%	0%	0%	0%
	2017 Alt3 w/ Growth fctrs					61	1119	27	100	2661	263	115	4	23	8	7	38
	Diff check GF- Abs (<50 OK)					1	-34	-6	-15	19	23	-1	0	0	0	0	0
	Alt3 Rounded Volumes					**60**	**1125**	**30**	**100**	**2675**	**275**	**125**	**10**	**20**	**10**	**10**	**40**
57	**Fairfax Cnty Pky NB - SB**		**Kingman Rd**														
	Existing Vol					**6**	**844**	**426**	**1350**	**984**	**27**	**3**	**6**	**4**	**39**	**3**	**158**
	17Alt3-13 AM Pk Prd Delta					23	-854	-321	605	-1557	94	20	5	3	-160	2	52
	17Alt3-13 AM Pk Hr (41.7%)					10	-356	-134	252	-649	39	8	2	1	-67	1	22
	17Alt3-13 AM Grth Fctr (%)					33%	-37%	-93%	20%	-78%	20%	33%	75%	6%	-50%	38%	18%
	2017 Alt3 w/ Growth fctrs					8	535	29	1616	220	32	4	11	4	20	4	187
	Diff check GF- Abs (<50 OK)					-8	47	-264	14	-115	-34	-7	2	-1	47	0	7
	ABSDelt>%Delt		Average Exist & Exist*Delta%				689								29		
	ABSDelt<%Delt		Average Exist & (Exist+Delta)					359		659							
	Alt3 Rounded Volumes					**10**	**700**	**350**	**1625**	**650**	**30**	**10**	**10**	**10**	**30**	**10**	**200**
	Route 1		**Lorton Rd (T int)**														
60	**Existing Vol**		**Route 1 coded as N-S**			**3**	**2503**	**0**	**7**	**562**	**145**	**737**	**0**	**15**	**0**	**0**	**0**
	17Alt3-13 AM Pk Prd Delta					-3	-707	0	0	-216	499	1234	0	-12	0	0	0
	17Alt3-13 AM Pk Hr (41.7%)					-1	-295	0	0	-90	208	515	0	-5	0	0	0
	17Alt3-13 AM Grth Fctr (%)					-4%	-15%	0	0	-10%	112%	46%	0	-13%	0	0	0
	2017 Alt3 w/ Growth fctrs					3	2134	0	7	504	307	1078	0	13	0	0	0
	Diff check GF- Abs (<50 OK)					1	**-74**	0	0	32	-46	**-174**	0	3	0	0	0
	ABSDelt>%Delt		Average Exist & Exist*Delta%				2318										
	Use average of Difference and growth factors methods											**1165**					
	Alt3 Rounded Volumes					**0**	**2325**	**0**	**10**	**500**	**300**	**1175**	**0**	**10**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
2017 Alternative 2 - PM Traffic Volume Computations at Selected Locations																	
					Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)										
1/2/2014							>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)							
Actual values are displayed as whole numbers			Products are based on mutiplication of actual values														
Site	Road Name		Road Name		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
	Route 1		Telegraph Rd														
62	Existing Vol		Route 1 coded as E-W		16	20	14	68	232	1039	235	647	27	128	2170	31	
	17Alt2-13-PM Pk Pd Delta				0	-14	23	101	-486	-917	-32	477	-4	-180	1958	13	
	17Alt2-13 PM Pk Hr (29.4%)				0	-4	7	30	-143	-269	-10	140	-1	-53	576	4	
	17Alt2-13 Alt1 Grth Fctr (%)				0%	-18%	42%	183%	-50%	-16%	-1%	13%	-7%	-30%	31%	10%	
	2017 Alt2 = Exist x Grth Fctr				16	16	20	192	116	869	232	732	25	90	2844	34	
	Diff check GF- Abs (<50 OK)				0	1	-1	**95**	27	**100**	6	**-55**	-1	15	**99**	-1	
	Average GF & Abs values							145				760			2795		
	Average Existing value & GF Decrease									954							
	Alt2 Rounded Volumes				**20**	**20**	**20**	**150**	**125**	**950**	**225**	**750**	**30**	**90**	**2800**	**40**	
	Route 1		Pohick Rd (Tulley Gate)														
64	Existing Vol		Route 1 coded as E-W		758	27	16	85	10	13	4	1264	214	40	1554	79	
	17Alt2-13-PM				-825	0	1	0	0	0	0	-238	-373	1	919	0	
	17Alt2-13-PM	inc 29.4%			-243	0	0	0	0	0	0	-70	-110	0	270	0	
	17Alt2-13-PM%				-22%	0%	6%	0%	0%	0%	0%	-5%	-18%	6%	15%	0%	
	2017 Alt2 w/ Growth fctrs				591	27	17	85	10	13	4	1207	175	42	1784	79	
	Diff check GF- Abs (<50 OK)				**76**	0	1	0	0	0	0	13	**70**	2	-40	0	
	Average Existing value & GF Decrease				675								194				
	Alt2 Rounded Volumes				**675**	**30**	**20**	**90**	**10**	**10**	**10**	**1200**	**200**	**40**	**1775**	**80**	
68	US Route 1		Mulligan Rd														
	Existing Vol				309	73	108	31	55	71	141	1201	305	53	957	24	
	17Alt2-13-PM				289	813	-669	554	681	233	445	938	131	-478	866	341	
	17Alt2-13-PM	inc 29.4%			85	239	-197	163	200	69	131	276	39	-141	255	100	
	17Alt2-13-PM%				25%	644%	-91%	448%	233%	27%	56%	21%	13%	-80%	18%	0%	
	2017 Alt2 w/ Growth fctrs				385	543	10	170	183	90	220	1450	345	11	1129	24	
	Diff check GF- Abs (<50 OK)				-8	**231**	**99**	-24	**-72**	-49	**-52**	-27	2	**98**	**-82**	**-100**	
	Average GF & Abs values					427			219	115	246				1170		
	Average Existing value & GF Decrease						59							32			
	Average existing + Abs Increase															74	
	Alt2 Rounded Volumes				**375**	**425**	**60**	**175**	**225**	**125**	**250**	**1450**	**350**	**30**	**1175**	**80**	

FORT BELVOIR TMP TRAFFIC ANALYSIS																	
2017 Alternative 3 - PM Traffic Volume Computations at Selected Locations																	
					Rounding Rules:		**"1 to 99 Rnd to 10x (up if >d3)**										
1/2/2014							**>100 Rnd to 25x (up if >25+10)**				**>100 Rnd to 25x (down if<25+11)**						
Site	**Road Name**		**Road Name**		**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
62	**Existing Vol**		**Route 1 coded as E-W**		16	20	14	68	232	1039	235	647	27	128	2170	31
	17Alt3-13-PM				0	-14	23	101	-486	-917	-32	477	-4	-180	1958	13
	17Alt3-13-PM	inc 29.4%			0	-4	7	30	-143	-269	-10	140	-1	-53	576	4
	17Alt3-13-PM%				0%	-18%	42%	183%	-50%	-16%	-1%	13%	-7%	-30%	31%	10%
	2017 Alt3 w/ Growth fctrs				16	16	20	192	116	869	232	732	25	90	2844	34
	Diff check GF- Abs (<50 OK)				-16	1	-1	**95**	27	**100**	6	**-55**	-1	15	**99**	-1
	Average GF & Abs values							145				760			2795	
	Average Existing value & GF Decrease									954						
	Alt3 Rounded Volumes				**20**	**20**	**20**	**150**	**125**	**950**	**225**	**750**	**30**	**90**	**2800**	**40**
	Route 1		**Pohick Rd (Tulley Gate)**													
64	**Existing Vol**		**Route 1 coded as E-W**		758	27	16	85	10	13	4	1264	214	40	1554	79
	17Alt3-13-PM				-825	0	1	0	0	0	0	-238	-373	1	919	0
	17Alt3-13-PM	inc 29.4%			-242.6	0	0	0	0	0	0	-70	-110	0	270	0
	17Alt3-13-PM%				-22%	0%	6%	0%	0%	0%	0%	-5%	-18%	6%	15%	0%
	2017 Alt3 w/ Growth fctrs				591	27	17	85	10	13	4	1207	175	42	1784	79
	Diff check GF- Abs (<50 OK)				**76**	0	1	0	0	0	0	13	70	2	-40	0
	Average Existing value & GF Decrease				675								194			
	Alt3 Rounded Volumes				**675**	**30**	**20**	**90**	**10**	**10**	**10**	**1200**	**200**	**40**	**1775**	**80**
68	**US Route 1**		**Mulligan Rd**													
	Existing Vol				309	73	108	31	55	71	141	1201	305	53	957	24
	17Alt3-13-PM				289	813	-669	554	681	233	445	938	131	-478	866	341
	17Alt3-13-PM	inc 29.4%			85	239	-197	163	200	69	131	276	39	-141	255	100
	17Alt3-13-PM%				25%	644%	-91%	448%	233%	27%	56%	21%	13%	-80%	18%	0%
	2017 Alt2 w/ Growth fctrs				385	543	10	170	183	90	220	1450	345	11	1129	24
	Diff check GF- Abs (<50 OK)				-8	**231**	99	-24	-72	-49	**-52**	-27	2	98	-82	-100
	Average GF & Abs values					427			219	115	246				1170	
	Average Existing value & GF Decrease						59							32		
	Average existing + Abs Increase															74
	Alt3 Rounded Volumes				**375**	**425**	**60**	**175**	**225**	**125**	**250**	**1450**	**350**	**30**	**1175**	**80**

FORT BELVOIR TMP TRAFFIC ANALYSIS										**Rounding Rules:**					
2017 No-Build and Alt 1 Traffic Volume Computations in AM and PM Peak Hours										**"1 to 99 Rnd to 10x (up if >d3)**					
1/7/2014										**>100 Rnd to 25x (up if >25+10)**			**>100 Rnd to 25x (down if<25+11)**		
Actual values are displayed as whole numbers								**Products are based on mutiplication of actual values**							
		Existing Vol		**2017 AM % Chg**		**2017 PM % Chg**		**AM 17 NB**		**AM 17 Alt1**		**PM 17 NB**		**PM 17 Alt1**	
		AM	**PM**	NB	Alt1	NB	Alt1	By %	**Rounded**	By %	**Rounded**	By %	**Rounded**	By %	**Rounded**
28	**Fairfax County Pkwy SB at Franconia-Springfield Pkwy**							**Diverge Analaysis - EB Exit Ramp to Rolling Rd**							
Upstrm link		5098	1933	22%	22%	17%	16%	6198	6300	6220	6350	2257	2250	2242	2250
Ramp link**		1683	470	38%	42%	46%	46%	2320	2325	2389	2400	686	700	684	700
Dnstrm link*		3415	1463	16%	16%	2%	1%	3973	3975	3947	3950	1485	1550	1471	1550
* Frnc-Sprng Pkwy															
29	**Fairfax County Pkwy WB at Franconia-Springfield Pkwy**							**Merge Analysis WB On Ramp from Rolling Rd**							
Upstrm link*		857	2940	-1%	0%	15%	14%	852	850	861	875	3369	3375	3363	3375
Loop link		654	1667	46%	44%	26%	28%	956	950	939	950	2108	2100	2139	2150
Merge link		1511	4607						1800		1825		5475		5525
* Frnc-Sprng Pkwy															
37	**Barta SB to FFx Pky SB**				**On Ramp loop frm SB Barta**			**Merge Analysis**							
Upstrm link*	c	1355	220	9%	13%	44%	44%	1480	1475	1530	1525	317	375	317	375
Loop link		59	258	12%	13%	-7%	-5%	66	75	67	75	241	300	246	300
Merge link		1414	478	9%	13%	41%	41%	1544	1550	1596	1600	673	675	672	675
* Derived from loop and downstream links															
38a	**FFx Pky SB to Barta Rd**				**Barta Rd Exit Ramp**			**Diverge Analysis**							
Upstrm link	c	2291	822	11%	14%	20%	21%	2546	2550	2606	2600	989	1000	993	1000
Ramp link**		936	602	15%	15%	-7%	-6%	1073	1075	1080	1075	559	550	567	575
Dnstrm link*		1355	220	9%	13%	44%	44%	1480	1475	1530	1525	317	450	317	425
* volume from Site 37															
39a	**Barta Rd SB to FFx Pky NB**				**Barta Rd On Ramp**			Merge Analysis							
Upstrm link*		980	1668	21%	20%	15%	17%	1184	1175	1177	1175	1915	1925	1952	1950
Ramp link**		55	485	1%	1%	0%	-1%	55	75	55	75	484	500	480	500
Merge link	c	1035	2153	20%	19%	12%	14%	1240	1250	1234	1250	2418	2425	2454	2450
* same vol as 354	** from site 39														

FORT BELVOIR TMP TRAFFIC ANALYSIS											Rounding Rules:					
2017 No-Build and Alt 1 Traffic Volume Computations in AM and PM Peak Hours											"1 to 99 Rnd to 10x (up if >d3)					
1/7/2014											>100 Rnd to 25x (up if >25+10)		>100 Rnd to 25x (down if<25+11)			
Actual values are displayed as whole numbers								Products are based on mutiplication of actual values								
		Existing Vol		2017 AM % Chg		2017 PM % Chg		AM 17 NB		AM 17 Alt1		PM 17 NB		PM 17 Alt1	
		AM	PM	NB	Alt1	NB	Alt1	By %	Rounded	By %	Rounded	By %	Rounded	By %	Rounded
40	**Barta Rd NB to FFx Pky NB**			**On Ramp loop frm NB Barta Rd**				**Merge Analysis**							
Upstrm link		530	1227	49%	47%	4%	6%	788	800	777	800	1272	1275	1301	1300
Loop link		450	441	-46%	-43%	82%	84%	242	375	255	375	803	800	810	800
Merge link	c	980	1668	21%	20%	15%	17%	1184	1175	1177	1175	1915	2075	1952	2100
Model forecasts significant AM Peak reduction in loop ramp entry volume. Rounded volume based on Average of Existing volume and forecast volume.															
41	**Weave Analysis for Barta Rd NB to FFx Pky SB**							**Weaving area - Barta to Boudinot**							
Upstrm link		1414	478	9%	13%	41%	41%	1544	1525	1596	1600	673	675	672	675
On-Ramp link		347	176	42%	38%	-5%	-7%	492	500	478	475	167	200	164	200
Weaving Link	c	1761	654	15%	17%	32%	32%	2017	2025	2059	2075	864	875	861	875
Exit Ramp Link		259	69	33%	55%	2%	2%	345	350	402	400	70	75	71	75
43	**I-95 SB HOT Lanes**							**Merge from North Area On-Ramp**							
Upstrm link		NA	NA	NA	NA				NA		NA	4684	4675	4724	4725
Ramp link		NA	NA	NA	NA				NA		NA	200	200	204	200
Merge link		NA	NA	NA	NA				NA		NA	4884	4875	4928	4925
No Existing Ramp. Ramp Operates in PM only in 2017															
2017 volumes based on 29.4% of PM Peak Period absolute volumes not growth factors.															
44	**Fairfax Cnty Pky NB**							**Weaving area - Bet 95 On Ramp and Boudinot Exit Ramp**							
V upstream =		1038	1796					1432	**1425**	1420	**1425**	1827	1825	1877	1875
Vonramp =	44	348	328	-9%	-8%	-36%	-44%	318	**325**	319	**325**	210	200	183	175
V Sum =		1386	2124	26%	25%	-4%	-3%	1749	**1750**	1739	**1750**	2037	2050	2060	2050
Vexit ramp =	44	680	897	12%	12%	-30%	-32%	760	**750**	764	**775**	626	625	610	600
V downstream =		706	1227					989	**1000**	974	**975**	1411	1425	1450	1450
Existing V Sum (Volume in weaving area) estimated based on available counts and proportional allocation															
(Traffic counts 44a and 44e)															
Manual adjustments made in base counts to maximize weaving volumes															
Assumes on-ramp to off ramp Volume = 0															

FORT BELVOIR TMP TRAFFIC ANALYSIS

2017 No-Build and Alt 1 Traffic Volume Computations in AM and PM Peak Hours

1/7/2014

Actual values are displayed as whole numbers

Rounding Rules:
"1 to 99 Rnd to 10x (up if >d3)
>100 Rnd to 25x (up if >25+10)
>100 Rnd to 25x (down if<25+11)

Products are based on mutiplication of actual values

		Existing Vol			2017 AM % Chg		2017 PM % Chg		AM 17 NB		AM 17 Alt1		PM 17 NB		PM 17 Alt1	
		AM	PM		NB	Alt1	NB	Alt1	By %	Rounded	By %	Rounded	By %	Rounded	By %	Rounded
ANALYSIS FOR WEAVING SECTIONS 45a AND 45b FOLLOWS SITE 55b																
54a	**Fairfax Cnty Pky SB**				**Exit Ramp to Telegraph Rd**				**Diverge Analysis**							
Upstrm link	**a**	**2441**	**1813**	b					a	2370	a	2495	a	1495	a	1545
Ramp link	*	**293**	**775**	*					*	400	*	450	*	675	*	675
Dnstrm link	**a**	**2148**	**1038**	b					a	1970	a	2045	a	820	a	870
a. Upstream and downstream link volumes based on volume from site 48																
b. Upstream and downstream link volumes based on volume from site 57																
* Ramp volume based on ramp data from site 54																
54b	**Fairfax Cnty Pky SB**				**On Ramp from Telegraph Rd**				**Merge Analysis**							
Upstrm link	**a**	**2148**	**1038**	b					a	**1970**	b	2060	b	835	b	890
Ramp link	*	**408**	**169**	*					*	**320**	*	320	*	40	*	60
Merge link	a	2556	1207	b					a	2290	b	2380	b	875	b	950
a. Upstream and downstream link volumes based on volume from site 48																
b. Upstream and downstream link volumes based on volume from site 57																
* Ramp volume based on ramp data from site 54																
55a	**Fairfax Cnty Pky NB**				**On Ramp from Telegraph Rd**				**Merge Analysis**							
Upstrm link	**a**	**1255**	**1470**	a					b	845	b	870	b	1265	b	1300
Ramp link	*	**206**	**206**	*					*	725	*	725	*	325	*	300
Merge link	**a**	**1461**	**1676**	a					b	1570	b	1595	b	1590	b	1600
a. Upstream and downstream link volumes based on volume from site 48																
b. Upstream and downstream link volumes based on volume from site 57																
* Ramp volume based on ramp data from site 55																
55b	**Fairfax Cnty Pky NB**				**Exit Ramp to Telegraph Rd**				**Diverge Analysis**							
Upstrm link	a	1406	203	a					b	875	b	910	b	1745	b	1880
Ramp link	*	151	533	*					*	30	*	40	*	480	*	580
Dnstrm link	a	1255	1470	a					b	845	b	870	b	1265	b	1300
a. Upstream and downstream link volumes based on volume from site 48																
b. Upstream and downstream link volumes based on volume from site 57																
* Ramp volume based on ramp data from site 55																

FORT BELVOIR TMP TRAFFIC ANALYSIS

2017 No-Build and Alt 1 Traffic Volume Computations in AM and PM Peak Hours

Weaving Movements on Fairfax County Parkway Over I-95 — **1/7/2014**

Actual values are displayed as whole numbers — **Products are based on mutiplication of actual values**

45 Fairfax Cnty Pky SB — **Weaving - 95 SB Exit Ramp to 95 NB On Ramp - AM**

			Existing Vol		2017 AM % Chg		AM 17 NB				AM 17 Alt1			
			AM	PM			By %	Sum Up(+/-)	Avg	Balanced & Rounded	By %	Sum Up(+/-)	Avg	Balanced & Rounded
E	SB FFxP over Backlick	C-D	**1683**		16%	17%	1949	2316	2133	**2125**	1961	2332	2147	**2150**
D	SB95 to SB FFxP	45d	**872**		-14%	-13%	746	746		**750**	756	756		**750**
C	SB Weave Area	A+B	**2555**		4%	6%	2660	**3062**	2861	**2875**	2708	**3088**	2898	**2950**
B	SB FFxP to NB95		**565**		97%	88%	1112	1112		**925**	1063	1063		**925**
A	SB FFxP to Loisdale		**1990**		-1%	1%	1966	1950	1958	**1950**	2016	2025	2020	**2025**
↑	Volume at Loisdale (Thru+Lt)		**1990**				1950				2025			

Lowisdale Intersection used as control for computations.

45 Fairfax Cnty Pky SB — **Weaving - 95 SB Exit Ramp to 95 NB On Ramp - PM**

			Existing Vol		2017 PM % Chg		PM 17 NB				PM 17 Alt1			
			AM	PM			By %	Sum Up(+/-)	Avg	Balanced & Rounded	By %	Sum Up(+/-)	Avg	Balanced & Rounded
E	SB FFxP over Backlick	C-D		**1590**	23%	23%	1953	1623	1788	**1800**	1958	1622	1790	**1800**
D	SB95 to SB FFxP	45d		**776**	-14%	-13%	668	668		**500**	673	673		**500**
C	SB Weave Area	A+B		**2366**	-3%	-3%	2286	**2291**	2289	**2300**	2290	**2295**	2293	**2300**
B	SB FFxP to NB95			**741**	-3%	-3%	716	716		**725**	720	720		**725**
A	SB FFxP to Loisdale			**1625**	-3%	-3%	1570	1575	1573	**1575**	1578	1575	1577	**1575**
↑	Volume at Loisdale (Thru+Lt)			**1625**			1575				1575			

FORT BELVOIR TMP TRAFFIC ANALYSIS

2017 No-Build and Alt 1 Traffic Volume Computations in AM and PM Peak Hours

Weaving Movements on Fairfax County Parkway Over I-95 — **1/7/2014**

Actual values are displayed as whole numbers — **Products are based on mutiplication of actual values**

45 Fairfax Cnty Pky NB — **Weaving - 95 NB Exit Ramp to 95 SB On Ramp - AM**

			Existing Vol		2017 AM % Chg		AM 17 NB				AM 17 Alt1			
			AM	PM			By %	Sum Dn +/-	Avg	Balanced & Rounded	By %	Sum Dn +/-	Avg	Balanced & Rounded
			From Site 46 Analysis					2175				2175		
A	NB FFxP - Loisdl to Ramp	46	**2253**		-7%	-7%	2103	2175	2139	**2150**	2098	2175	2136	**2150**
B	NB FFXP to NB95	45f	**779**		-28%	-26%	558	558		**625**	574	574		**600**
			1474							**1525**				**1550**
C	NB 95 to NB FFxP	45e	**545**		3%	-16%	563	563		**575**	459	459		**450**
D	NB Weave Area	A-B+C	**2019**		0%	-4%	2022	2180	2101	**2100**	1940	2060	2000	**2000**
E	NB FFxP to SB95	45b	**662**		19%	20%	786	786		**950**	797	797		**900**
H	NB FFxP to Backlick	45a	**500**		-23%	-29%	385	385			356	356		
J	NB FFxP over Backlick	D-E-H	**857**		50%	48%	1282	1009	1146	**1150**	1268	907	1088	**1100**

45 Fairfax Cnty Pky NB — **Weaving - 95 NB Exit Ramp to 95 SB On Ramp - PM**

			Existing Vol		2017 PM % Chg		PM 17 NB				PM 17 Alt1			
			AM	PM			By %	Sum Dn +/-	Avg	Balanced & Rounded	By %	Sum Dn +/-	Avg	Balanced & Rounded
		From Site 46 Analysis						2575				2650		
A	NB FFxP - Loisdl to Ramp	46		**2568**	0%	2%	2570	2575	2573	**2575**	2630	2650	2640	**2650**
B	NB FFXP to NB95	45f		**1143**	-11%	-9%	1015	1015		**1025**	1045	1045		**1125**
				1425						**1550**				**1525**
C	NB 95 to NB FFxP	45e		**277**	-2%	-3%	272	272		**275**	268	268		**275**
D	NB Weave Area	A-B+C		**1702**	5%	6%	1791	1832	1811	**1825**	1809	1873	1841	**1850**
E	NB FFxP to SB95	45b		**427**	-29%	-35%	304	304		**700**	278	278		**675**
H	NB FFxP to Backlick	45a		**291**	-8%	-9%	267	267			265	265		
J	NB FFxP over Backlick	D-E-H		**984**	2%	4%	1001	1262	1131	**1125**	1028	1330	1179	**1175**

FORT BELVOIR TMP TRAFFIC ANALYSIS		Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes			1/30/2014									
	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers	Products are based on mutiplication of actual values											
Site	**NS Steet** **EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
1	**DLA West Gate Kingman Rd**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**	0	819	720	51	143	0	52	0	28	0	0	0
B	**Sum of Approach Vol**		1539			194			80			0	
C	**Dist of Approach Vol**	0%	53%	47%	26%	74%	0%	65%	0%	35%	0%	0%	0%
D	**Approach Growth Factor**		1.8%			27%			4%			0%	
E	**New Approach Vol Sum = B x D**		1567			247			84			0	
F	**Vol Based on Entry Dist. = C x E**	0	834	733	65	182	0	54	0	29	0	0	0
		Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**	0	819	28	52	143	0	0	0	0	51	0	720
H	**Sum of Exit Vol**		847			195			0			771	
J	**Dist of Exit Vol**	0%	97%	3%	27%	73%	0%	0%	0%	0%	7%	0%	93%
K	**Exit Growth Factor**		17%			-33%			0%			0%	
L	**New Exit Vol Sum = H x K**		988			131			0			769	
M	**Vol Based on Exit Dist = J x L**	0	955	33	35	96	0	0	0	0	51	0	718
N	**Transpose Exit Vols (EBL…SBR)**	0	955	718	51	96	0	35	0	33	0	0	0
O	**Average Entry & Exit Vols = (F+N)/2**	0	895	726	58	139	0	45	0	31	0	0	0
P	**Revised Sum of Approach Vol**		1620			197			76			0	
R	**Revised Dist of Approach Vol**	0%	55%	45%	29%	71%	0%	59%	0%	41%	0%	0%	0%
	Rounded Volumes	**0**	**900**	**725**	**60**	**150**	**0**	**50**	**0**	**30**	**0**	**0**	**0**
Site	**NS Steet** **EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
2	**DLA East Gate Kingman Rd**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**	0	812	291	312	145	0	29	0	23	0	0	0
B	**Sum of Approach Vol**		1103			457			52			0	
C	**Dist of Approach Vol**	0%	74%	26%	68%	32%	0%	56%	0%	44%	0%	0%	0%
D	**Approach Growth Factor**		17%			**110%**			5%			0%	
E	**New Appch Vol Sum = B x D/B+abs/Avg (1)**		1286		**960**	**841**	**900**		55			0	
F	**Vol Based on Entry Dist. = C x E**	0	947	339	**615**	**286**	**0**	30	0	24	0	0	0
		Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**	0	812	23	29	145	0	0	0	0	312	0	291
H	**Sum of Exit Vol**		835			174			0			603	
J	**Dist of Exit Vol**	0%	97%	3%	17%	83%	0%	0%	0%	0%	52%	0%	48%
K	**Exit Growth Factor**		48%			27%			0%			0%	
L	**New Exit Vol Sum = H x K**		1239			221			0			601	
M	**Vol Based on Exit Dist = J x L**	0	1205	34	37	184	0	0	0	0	311	0	290
N	**Transpose Exit Vols (EBL…SBR)**	0	1205	290	311	184	0	37	0	34	0	0	0
O	**Average Entry & Exit Vols = (F+N)/2**	0	1076	315	463	235	0	34	0	29	0	0	0
P	**Revised Sum of Approach Vol**		1391			698			63			0	
R	**Revised Dist of Approach Vol**	0%	77%	23%	66%	34%	0%	54%	0%	46%	0%	0%	0%
	Rounded Volumes	**0**	**1075**	**325**	**475**	**225**	**0**	**40**	**0**	**30**	**0**	**0**	**0**
1	**Entry volumes for westbound approach based on average of volumes from growth factor and absolute volume increase.**												

FORT BELVOIR TMP TRAFFIC ANALYSIS — **Estimated 2017 Volumes Within Fort Belvoir - AM No-Build**

Growth Factors Based on Peak Period Link Volumes — 1/30/2014

Rounding Rules: "1 to 99 Rnd to 10x (up if >d3) — >100 Rnd to 25x (up if >25+10) — >100 Rnd to 25x (down if<25+11)

Actual values are displayed as whole numbers — Products are based on mutiplication of actual values

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
3	Beulah St	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		29	509	153	59	150	115	7	19	27	534	108	229
B	Sum of Approach Vol			691			324			53			871	
C	Dist of Approach Vol		4%	74%	22%	18%	46%	35%	13%	36%	51%	61%	12%	26%
D	Approach Growth Factor			48%			67%			1%			-15%	
E	New Approach Vol Sum = B x D			1025			540			54			740	
F	Vol Based on Entry Dist. = C x E		43	755	227	98	250	192	7	19	27	454	92	195
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		534	509	27	7	150	229	29	19	115	59	108	153
H	Sum of Exit Vol			1070			386			163			320	
J	Dist of Exit Vol		50%	48%	3%	2%	39%	59%	18%	12%	71%	18%	34%	48%
K	Exit Growth Factor			21%			**110%**			7%			-1%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			1294		**811**	**770**	**790**		174			317	
M	Vol Based on Exit Dist = J x L		646	615	33	**14**	**307**	**469**	31	20	123	58	107	152
N	Transpose Exit Vols (EBL…SBR)		31	615	152	58	307	123	14	20	33	646	107	469
O	Average Entry & Exit Vols = (F+N)/2		37	685	189	78	279	157	11	20	30	550	99	332
P	Revised Sum of Approach Vol			912			514			60			981	
R	Revised Sist of Approach Vol		4%	75%	21%	15%	54%	31%	18%	33%	50%	56%	10%	34%
	Rounded Volumes		**40**	**675**	**200**	**80**	**275**	**150**	**10**	**20**	**30**	**550**	**100**	**325**

2 Volumes for westbound exit based on average of volumes from growth factor and absolute volume increase.

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
4	Gunston Rd	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		0	9	1067	11	17	0	373	0	16	0	0	0
B	**Sum of Approach Vol**			**1076**			**28**			**389**			**0**	
C	**Dist of Approach Vol**		**0%**	**1%**	**99%**	**39%**	**61%**	**0%**	**96%**	**0%**	**4%**	**0%**	**0%**	**0%**
D	**Approach Growth Factor**			21%			-25%			**102%**			0%	
E	**New Appch Vol Sum = B x D**			1301			21			**787**			0	
F	**Vol Based on Entry Dist. = C x E**		0	11	1289.941	8	13	0	**754**	**0**	**32**	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		0	9	16	373	17	0	0	0	0	11	0	1067
H	**Sum of Exit Vol**			25			390			0			1078	
J	**Dist of Exit Vol**		0%	36%	64%	96%	4%	0%	0%	0%	0%	1%	0%	99%
K	**Exit Growth Factor**			-85%			67%			0%			81%	
L	**New Exit Vol Sum = H x K**			4			650			0			1956	
M	**Vol Based on Exit Dist = J x L**		0	1	2	622	28	0	0	0	0	20	0	1936
N	**Transpose Exit Vols (EBL…SBR)**		0	1	1936	20	28	0	622	0	2	0	0	0
O	**Average Entry & Exit Vols = (F+N)/2**		0	6	1613	14	21	0	688	0	17	0	0	0
P	**Revised Sum of Approach Vol**			1619			35			705			0	
R	**Revised Dist of Approach Vol**		0%	0%	100%	41%	59%	0%	98%	0%	2%	0%	0%	0%
	Rounded Volumes		**0**	**10**	**1625**	**20**	**20**	**0**	**700**	**0**	**20**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
5	Woodlawn	Gorgas	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		6	89	21	1	106	3	42	2	1	5	0	16
B	Sum of Approach Vol			116			110			45			21	
C	Dist of Approach Vol		5%	77%	18%	1%	96%	3%	93%	4%	2%	24%	0%	76%
D	Approach Growth Factor			-33%			0%			-25%			-85%	
E	New Approach Vol Sum = B x D			77			110			34			3	
F	Vol Based on Entry Dist. = C x E		4	59	14	1	106	3	31	1	1	1	0	2
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		5	89	1	42	106	16	6	2	3	1	0	21
H	Sum of Exit Vol			95			164			11			22	
J	Dist of Exit Vol		5%	94%	1%	26%	65%	10%	55%	18%	27%	5%	0%	95%
K	Exit Growth Factor			0%			-20%			-25%			-85%	
L	New Exit Vol Sum = H x K			95			131			8			3	
M	Vol Based on Exit Dist = J x L		**5**	**89**	**1**	**34**	**85**	**13**	**4**	**1**	**2**	**0**	**0**	**3**
N	Transpose Exit Vols (EBL…SBR)		**4**	**89**	**3**	**0**	**85**	**2**	**34**	**1**	**1**	**5**	**0**	**13**
O	Average Entry & Exit Vols = (F+N)/2		**4**	**74**	**9**	**1**	**95**	**3**	**33**	**1**	**1**	**3**	**0**	**8**
P	Revised Sum of Approach Vol			**87**			**99**			**35**			**10**	
R	Revised Dist of Approach Vol		**5%**	**85%**	**10%**	**1%**	**97%**	**3%**	**93%**	**4%**	**3%**	**27%**	**0%**	**73%**
	Rounded Volumes		**10**	**80**	**10**	**0**	**100**	**0**	**30**	**0**	**0**	**0**	**0**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
6	Gunston Rd	Abbott Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		5	5	3	103	3	54	29	338	55	37	887	67
B	Sum of Approach Vol			13			160			422			991	
C	Dist of Approach Vol		38%	38%	23%	64%	2%	34%	7%	80%	13%	4%	90%	7%
D	Approach Growth Factor			0%			-48%			260%			106%	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			13			82		1521	1496	1509		2038	
F	Vol Based on Entry Dist. = C x E		5	5	3	53	2	28	104	1208	197	76	1824	138
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		37	5	55	29	3	67	5	338	54	103	887	3
H	Sum of Exit Vol			97			99			397			993	
J	Dist of Exit Vol		38%	5%	57%	29%	3%	68%	1%	85%	14%	10%	89%	0%
K	Exit Growth Factor			-68%			0%			125%			179%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			31			99		892	798	845	2769	2025	2397
M	Vol Based on Exit Dist = J x L		12	2	17	29	3	67	11	720	115	249	2141	7
N	Transpose Exit Vols (EBL…SBR)		11	2	7	249	3	115	29	720	17	12	2141	67
O	Average Entry & Exit Vols = (F+N)/2		**8**	**3**	**5**	**151**	**2**	**71**	**66**	**964**	**107**	**44**	**1983**	**102**
P	Revised Sum of Approach Vol			16			225			1137			2129	
R	Revised Dist of Approach Vol		48%	20%	32%	67%	1%	32%	6%	85%	9%	2%	93%	5%
	Rounded Volumes		**10**	**0**	**10**	**150**	**0**	**70**	**70**	**975**	**100**	**50**	**1975**	**100**
1	Entry volumes for northbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Exit volumes for northbound and southbound exits based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)				>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
7	Gunston Rd	Goethals Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		9	1	6	56	2	18	22	402	56	65	940	18
B	Sum of Approach Vol			16			76			480			1023	
C	Dist of Approach Vol		56%	6%	38%	74%	3%	24%	5%	84%	12%	6%	92%	2%
D	Approach Growth Factor			0%			167%			241%			179%	
E	New Approach Vol Sum = B x D			16			203			1637			2852	
F	Vol Based on Entry Dist. = C x E		9	1	6	150	5	48	75	1371	191	181	2621	50
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		65	1	56	22	2	18	9	402	18	56	940	6
H	Sum of Exit Vol			122			42			429			1002	
J	Dist of Exit Vol		53%	1%	46%	52%	5%	43%	2%	94%	4%	6%	94%	1%
K	Exit Growth Factor			525%			0%			260%			121%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)		**762**	**578**	**670**		42		**1546**	**877**	**1211**	**2219**	**1914**	**2067**
M	Vol Based on Exit Dist = J x L		**357**	**5**	**307**	22	2	18	**25**	**1135**	**51**	**116**	**1939**	**12**
N	Transpose Exit Vols (EBL…SBR)		25	5	12	116	2	51	22	1135	307	357	1939	18
O	Average Entry & Exit Vols = (F+N)/2		**17**	**3**	**9**	**133**	**4**	**49**	**49**	**1253**	**249**	**269**	**2280**	**34**
P	Revised Sum of Approach Vol			30			186			1551			2583	
R	Revised Dist of Approach Vol		58%	11%	31%	71%	2%	27%	3%	81%	16%	10%	88%	1%
	Rounded Volumes		**20**	**0**	**10**	**125**	**10**	**50**	**50**	**1250**	**250**	**275**	**2275**	**40**
2	Volumes for eastbound, northbound and southbound exits based on average of volumes from growth factor and absolute volume increase.													

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
8	Gunston Rd	1st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	15	0	127	0	401	23	330	686	0
B	Sum of Approach Vol			0			142			424			1016	
C	Dist of Approach Vol		0%	0%	0%	11%	0%	89%	0%	95%	5%	32%	68%	0%
D	Approach Growth Factor			0%			0%			25%			152%	
E	New Approach Vol Sum = B x D			0			142			530			2561	
F	Vol Based on Entry Dist. = C x E		0	0	0	15	0	127	0	501	29	832	1729	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		330	0	23	0	0	0	0	401	127	15	686	0
H	Sum of Exit Vol			353			0			528			701	
J	Dist of Exit Vol		93%	0%	7%	0%	0%	0%	0%	76%	24%	2%	98%	0%
K	Exit Growth Factor			0%			0%			25%			152%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			353			0			660		**1767**	**1739**	**1753**
M	Vol Based on Exit Dist = J x L		330	0	23	0	0	0	0	501	159	**38**	**1715**	**0**
N	Transpose Exit Vols (EBL…SBR)		0	0	0	38	0	159	0	501	23	330	1715	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**0**	**0**	**26**	**0**	**143**	**0**	**501**	**26**	**581**	**1722**	**0**
P	Revised Sum of Approach Vol			0			169			527			2303	
R	Revised Dist of Approach Vol		0%	0%	0%	16%	0%	84%	0%	95%	5%	25%	75%	0%
	Rounded Volumes		**0**	**0**	**0**	**30**	**0**	**150**	**50**	**500**	**30**	**575**	**1725**	**0**
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build										
	Growth Factors Based on Peak Period Link Volumes			1/30/2014									
	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
9	Gunston Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	8	0	103	0	562	52	79	488	0
B	Sum of Approach Vol			0			111			614			567	
C	Dist of Approach Vol		0%	0%	0%	7%	0%	93%	0%	92%	8%	14%	86%	0%
D	Approach Growth Factor		0%			-100%				107%			166%	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			0			0		1271	1144	1208		1510	
F	Vol Based on Entry Dist. = C x E		0	0	0	0	0	0	0	1106	102	210	1299	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		79	0	52	0	0	0	0	562	103	8	488	0
H	Sum of Exit Vol			131			0			665			496	
J	Dist of Exit Vol		60%	0%	40%	0%	0%	0%	0%	85%	15%	2%	98%	0%
K	Exit Growth Factor			-99%			0%			-4%			232%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			1			0			637		1648	1408	1528
M	Vol Based on Exit Dist = J x L		0	0	0	0	0	0	0	539	99	25	1503	0
N	Transpose Exit Vols (EBL…SBR)		0	0	0	25	0	99	0	539	0	0	1503	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**0**	**0**	**12**	**0**	**50**	**0**	**822**	**51**	**105**	**1401**	**0**
P	Revised Sum of Approach Vol			0			62			873			1507	
R	Revised Dist of Approach Vol		0%	0%	0%	20%	0%	80%	0%	94%	6%	7%	93%	0%
	Rounded Volumes		**0**	**0**	**0**	**10**	**0**	**50**	**0**	**825**	**50**	**100**	**1400**	**0**
1	Entry volumes for northbound approach based on a average of Absolute and growth factor increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
10	Gunston Rd	Pohick Rd/12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		312	310	231	83	60	164	36	129	41	159	278	43
B	Sum of Approach Vol			853			307			206			480	
C	Dist of Approach Vol		37%	36%	27%	27%	20%	53%	17%	63%	20%	33%	58%	9%
D	Approach Growth Factor			14%			0%			32%			229%	
E	New Approach Vol Sum = B x D			974			306			273			1582	
F	Vol Based on Entry Dist. = C x E		356	354	263.6604	83	60	163	48	171	54	524	916	142
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		159	310	41	36	60	43	312	129	164	83	278	231
H	Sum of Exit Vol			510			139			605			592	
J	Dist of Exit Vol		31%	61%	8%	26%	43%	31%	52%	21%	27%	14%	47%	39%
K	Exit Growth Factor			14%			164%			107%			2%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			582			367		**1253**	**826**	**1039**		605	
M	Vol Based on Exit Dist = J x L		181	354	47	95	158	114	**536**	**222**	**282**	85	284	236
N	Transpose Exit Vols (EBL…SBR)		536	354	236	85	158	282	95	222	47	181	284	114
O	Average Entry & Exit Vols = (F+N)/2		**446**	**354**	**250**	**84**	**109**	**223**	**71**	**196**	**51**	**353**	**600**	**128**
P	Revised Sum of Approach Vol			1050			415			318			1080	
R	Revised Dist of Approach Vol		42%	34%	24%	20%	26%	54%	22%	62%	16%	33%	56%	12%
	Rounded Volumes		**450**	**350**	**250**	**90**	**100**	**225**	**70**	**200**	**50**	**350**	**600**	**125**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
2	Volumes for westbound and northbound exits based on average of volumes from growth factor and absolute volume increase.													

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
11	Gunston Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		38	44	20	3	33	41	4	74	7	97	355	58
B	Sum of Approach Vol			102			77			85			510	
C	Dist of Approach Vol		37%	43%	20%	4%	43%	53%	5%	87%	8%	19%	70%	11%
D	Approach Growth Factor			0%			0%			32%			2%	
E	New Approach Vol Sum = B x D			102			77			113			522	
F	Vol Based on Entry Dist. = C x E		38	44	20	3	33	41	5	98	9	99	363	59
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		97	44	7	4	33	58	38	74	41	3	355	20
H	Sum of Exit Vol			148			95			153			378	
J	Dist of Exit Vol		66%	30%	5%	4%	35%	61%	25%	48%	27%	1%	94%	5%
K	Exit Growth Factor			0%			0%			32%			2%	
L	New Exit Vol Sum = H x K			148			95			203			387	
M	Vol Based on Exit Dist = J x L		97	44	7	4	33	58	50	98	54	3	363	20
N	Transpose Exit Vols (EBL...SBR)		50	44	20	3	33	54	4	98	7	97	363	58
O	Average Entry & Exit Vols = (F+N)/2		**44**	**44**	**20**	**3**	**33**	**48**	**5**	**98**	**8**	**98**	**363**	**59**
P	Revised Sum of Approach Vol			108			84			111			520	
R	Revised Dist of Approach Vol		41%	41%	19%	4%	39%	57%	4%	88%	7%	19%	70%	11%
	Rounded Volumes		**50**	**50**	**20**	**0**	**30**	**50**	**10**	**100**	**10**	**100**	**375**	**60**

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
12	Gunston Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		22	2	441	0	1	0	37	46	1	0	174	8
B	Sum of Approach Vol			465			1			84			182	
C	Dist of Approach Vol		5%	0%	95%	0%	100%	0%	44%	55%	1%	0%	96%	4%
D	Approach Growth Factor			0%			-7%			1%			2%	
E	New Approach Vol Sum = B x D			465			1			85			186	
F	Vol Based on Entry Dist. = C x E		22	2	441	0	1	0	37	46	1	0	178	8
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	2	1	37	1	8	22	46	0	0	174	441
H	Sum of Exit Vol			3			46			68			615	
J	Dist of Exit Vol		0%	67%	33%	80%	2%	17%	32%	68%	0%	0%	28%	72%
K	Exit Growth Factor			-44%			0%			32%			-1%	
L	New Exit Vol Sum = H x K			2			46			90			608	
M	Vol Based on Exit Dist = J x L		0	1	1	37	1	8	29	61	0	0	172	436
N	Transpose Exit Vols (EBL...SBR)		29	1	436	0	1	0	37	61	1	0	172	8
O	Average Entry & Exit Vols = (F+N)/2		**26**	**2**	**439**	**0**	**1**	**0**	**37**	**54**	**1**	**0**	**175**	**8**
P	Revised Sum of Approach Vol			466			1			92			183	
R	Revised Dist of Approach Vol		5%	0%	94%	0%	100%	0%	41%	59%	1%	0%	96%	4%
	Rounded Volumes		**30**	**0**	**450**	**0**	**0**	**0**	**40**	**60**	**0**	**0**	**175**	**10**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
13	Gunston Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	103	0	41	0	29	13	75	444	0
B	Sum of Approach Vol			0			144			42			519	
C	Dist of Approach Vol		0%	0%	0%	72%	0%	28%	0%	69%	31%	14%	86%	0%
D	Approach Growth Factor			0%			0%			131%			-1%	
E	New Approach Vol Sum = B x D			0			144			97			513	
F	Vol Based on Entry Dist. = C x E		0	0	0	103	0	41	0	67	30	74	439	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		75	0	13	0	0	0	0	29	41	103	444	0
H	Sum of Exit Vol			88			0			70			547	
J	Dist of Exit Vol		85%	0%	15%	0%	0%	0%	0%	41%	59%	19%	81%	0%
K	Exit Growth Factor			0%			0%			1%			-1%	
L	New Exit Vol Sum = H x K			88			0			71			541	
M	Vol Based on Exit Dist = J x L		75	0	13	0	0	0	0	29	41	102	439	0
N	Transpose Exit Vols (EBL...SBR)		0	0	0	102	0	41	0	29	13	75	439	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**0**	**0**	**102**	**0**	**41**	**0**	**48**	**22**	**75**	**439**	**0**
P	Revised Sum of Approach Vol			0			144			70			514	
R	Revised Dist of Approach Vol		0%	0%	0%	71%	0%	29%	0%	69%	31%	15%	85%	0%
	Rounded Volumes		**0**	**0**	**0**	**100**	**0**	**40**	**0**	**50**	**20**	**80**	**450**	**0**
Site			Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
14	Belvoir Hospital Traffic Circle		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		**90**	**2**	**46**	**3**	**1**	**1**	**151**	**142**	**14**	**5**	**458**	**519**
B	Sum of Approach Vol			**138**			**5**			**307**			**982**	
C	Dist of Approach Vol		65%	1%	33%	60%	20%	20%	49%	46%	5%	1%	47%	53%
D	Approach Growth Factor			0%			0%			-23%			-26%	
E	New Approach Vol Sum = B x D			138			5			236			725	
F	Vol Based on Entry Dist. = C x E		90	2	46	3	1	1	116	109	11	4	338	383
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		5	2	14	151	1	519	90	142	1	3	458	46
H	Sum of Exit Vol			21			671			233			507	
J	Dist of Exit Vol		24%	10%	67%	23%	0%	77%	39%	61%	0%	1%	90%	9%
K	Exit Growth Factor			0%			0%			-23%			-26%	
L	New Exit Vol Sum = H x K			21			671			179			374	
M	Vol Based on Exit Dist = J x L		5	2	14	151	1	519	69	109	1	2	338	34
N	Transpose Exit Vols (EBL...SBR)		69	2	34	2	1	1	151	109	14	5	338	519
O	Average Entry & Exit Vols = (F+N)/2		**80**	**2**	**40**	**3**	**1**	**1**	**134**	**109**	**12**	**4**	**338**	**451**
P	Revised Sum of Approach Vol			122			4			255			793	
R	Revised Dist of Approach Vol		65%	2%	33%	58%	22%	20%	52%	43%	5%	1%	43%	57%
	Rounded Volumes		**80**	**2**	**40**	**3**	**0**	**0**	**125**	**100**	**10**	**10**	**350**	**450**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)				>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
15	Belvoir Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		15	13	66	0	0	0	134	145	52	0	528	91
B	Sum of Approach Vol			94			0			331			619	
C	Dist of Approach Vol		16%	14%	70%	0%	0%	0%	40%	44%	16%	0%	85%	15%
D	Approach Growth Factor			0%			-31%			-19%			-26%	
E	New Approach Vol Sum = B x D			94			0			267			457	
F	Vol Based on Entry Dist. = C x E		15	13	66	0	0	0	108	117	42	0	390	67
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	13	52	134	0	91	15	145	0	0	528	66
H	Sum of Exit Vol			65			225			160			594	
J	Dist of Exit Vol		0%	20%	80%	60%	0%	40%	9%	91%	0%	0%	89%	11%
K	Exit Growth Factor			-17%			0%			-23%			-29%	
L	New Exit Vol Sum = H x K			54			225			123			419	
M	Vol Based on Exit Dist = J x L		0	11	43	134	0	91	12	112	0	0	373	47
N	Transpose Exit Vols (EBL…SBR)		12	11	47	0	0	0	134	112	43	0	373	91
O	Average Entry & Exit Vols = (F+N)/2		**13**	**12**	**56**	**0**	**0**	**0**	**121**	**114**	**43**	**0**	**381**	**79**
P	Revised Sum of Approach Vol			81			0			278			460	
R	Revised Dist of Approach Vol		16%	15%	69%	0%	0%	0%	44%	41%	15%	0%	83%	17%
	Rounded Volumes		**10**	**10**	**60**	**0**	**0**	**0**	**125**	**125**	**40**	**0**	**375**	**80**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
16	Belvoir Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		106	10	29	7	10	11	34	268	4	18	409	121
B	Sum of Approach Vol			145			28			306			548	
C	Dist of Approach Vol		73%	7%	20%	25%	36%	39%	11%	88%	1%	3%	75%	22%
D	Approach Growth Factor			-99%			-99%			-4%			-29%	
E	New Approach Vol Sum = B x D			1			0			292			387	
F	Vol Based on Entry Dist. = C x E		1	0	0.176829	0	0	0	32	256	4	13	289	85
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		18	10	4	34	10	121	106	268	11	7	409	29
H	Sum of Exit Vol			32			165			385			445	
J	Dist of Exit Vol		56%	31%	13%	21%	6%	73%	28%	70%	3%	2%	92%	7%
K	Exit Growth Factor			-49%			-100%			-19%			-21%	
L	New Exit Vol Sum = H x K			16			1			310			352	
M	Vol Based on Exit Dist = J x L		9	5	2	0	0	0	85	216	9	6	324	23
N	Transpose Exit Vols (EBL…SBR)		85	5	23	6	0	9	0	216	2	9	324	0
O	Average Entry & Exit Vols = (F+N)/2		**43**	**3**	**12**	**3**	**0**	**4**	**16**	**236**	**3**	**11**	**306**	**43**
P	Revised Sum of Approach Vol			57			7			255			360	
R	Revised Dist of Approach Vol		75%	5%	20%	38%	1%	61%	6%	92%	1%	3%	85%	12%
	Rounded Volumes		**40**	**0**	**10**	**0**	**0**	**10**	**20**	**250**	**0**	**10**	**300**	**40**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes			1/30/2014										
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	**NS Street**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
17	**Belvoir Rd**	**12th St**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		200	0	243	0	0	0	152	76	0	0	264	138
B	**Sum of Approach Vol**			443			0			228			402	
C	**Dist of Approach Vol**		45%	0%	55%	0%	0%	0%	67%	33%	0%	0%	66%	34%
D	**Approach Growth Factor**			-5%			0%			0%			-21%	
E	**New Approach Vol Sum = B x D**			422			0			228			318	
F	**Vol Based on Entry Dist. = C x E**		191	0	231	0	0	0	152	76	0	0	209	109
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		0	0	0	152	0	138	200	76	0	0	264	243
H	**Sum of Exit Vol**			0			290			276			507	
J	**Dist of Exit Vol**		0%	0%	0%	52%	0%	48%	72%	28%	0%	0%	52%	48%
K	**Exit Growth Factor**			0%			-36%			-4%			220%	
L	**New Exit Vol Sum = H x K/H+abs/Avg (2)**			0			185			264		1622	627	1125
M	**Vol Based on Exit Dist = J x L**		0	0	0	97	0	88	191	73	0	0	586	539
N	**Transpose Exit Vols (EBL...SBR)**		191	0	539	0	0	0	97	73	0	0	586	88
O	**Average Entry & Exit Vols = (F+N)/2**		**191**	**0**	**385**	**0**	**0**	**0**	**124**	**74**	**0**	**0**	**397**	**99**
P	**Revised Sum of Approach Vol**			576			0			199			496	
R	**Revised Dist of Approach Vol**		33%	0%	67%	0%	0%	0%	63%	37%	0%	0%	80%	20%
	Rounded Volumes		**200**	**0**	**375**	**0**	**0**	**0**	**125**	**80**	**0**	**0**	**400**	**100**
2	**Volumes for souththbound exit based on average of volumes from growth factor and absolute volume increase.**													

Site	**NS Street**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
18	**Belvoir Rd**	**16th St**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		30	1	85	0	0	0	29	170	5	1	367	59
B	**Sum of Approach Vol**			116			0			204			427	
C	**Dist of Approach Vol**		26%	1%	73%	0%	0%	0%	14%	83%	2%	0%	86%	14%
D	**Approach Growth Factor**			0%			0%			0%			220%	
E	**New Appch Vol Sum = B x D/B+abs/Avg (1)**			116			0			204		**1366**	**715**	**1041**
F	**Vol Based on Entry Dist. = C x E**		30	1	85	0	0	0	29	170	5	**2**	**895**	**144**
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		1	1	5	29	0	59	30	170	0	0	367	85
H	**Sum of Exit Vol**			7			88			200			452	
J	**Dist of Exit Vol**		14%	14%	71%	33%	0%	67%	15%	85%	0%	0%	81%	19%
K	**Exit Growth Factor**			0%			0%			0%			220%	
L	**New Exit Vol Sum = H x K/H+abs/Avg (2)**			7			88			200		**1446**	**572**	**1009**
M	**Vol Based on Exit Dist = J x L**		1	1	5	29	0	59	30	170	0	**0**	**819**	**190**
N	**Transpose Exit Vols (EBL...SBR)**		30	1	190	0	0	0	29	170	5	1	819	59
O	**Average Entry & Exit Vols = (F+N)/2**		**30**	**1**	**137**	**0**	**0**	**0**	**29**	**170**	**5**	**2**	**857**	**101**
P	**Revised Sum of Approach Vol**			168			0			204			960	
R	**Revised Dist of Approach Vol**		18%	1%	82%	0%	0%	0%	14%	83%	2%	0%	89%	11%
	Rounded Volumes		**30**	**0**	**150**	**0**	**0**	**0**	**30**	**175**	**10**	**0**	**850**	**100**
1	**Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.**													
2	**Volumes for souththbound exit based on average of volumes from growth factor and absolute volume increase.**													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
19	Belvoir Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		16	16	2	85	58	68	7	88	17	51	57	29
B	Sum of Approach Vol			34			211			112			137	
C	Dist of Approach Vol		47%	47%	6%	40%	27%	32%	6%	79%	15%	37%	42%	21%
D	Approach Growth Factor			-44%			-36%			0%			220%	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			19			136			112		**438**	**425**	**432**
F	Vol Based on Entry Dist. = C x E		9	9	1.119171	55	37	44	7	88	17	**161**	**180**	**91**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		51	16	17	7	58	29	16	88	68	85	57	2
H	Sum of Exit Vol			84			94			172			144	
J	Dist of Exit Vol		61%	19%	20%	7%	62%	31%	9%	51%	40%	59%	40%	1%
K	Exit Growth Factor			-57%			-7%			0%			0%	
L	New Exit Vol Sum = H x K			36			88			172			144	
M	Vol Based on Exit Dist = J x L		22	7	7	7	54	27	16	88	68	85	57	2
N	Transpose Exit Vols (EBL…SBR)		16	7	2	85	54	68	7	88	7	22	57	27
O	Average Entry & Exit Vols = (F+N)/2		**12**	**8**	**2**	**70**	**46**	**56**	**7**	**88**	**12**	**91**	**118**	**59**
P	Revised Sum of Approach Vol			22			171			107			269	
R	Revised Dist of Approach Vol		57%	36%	7%	41%	27%	33%	6%	82%	11%	34%	44%	22%
	Rounded Volumes		**10**	**10**	**0**	**70**	**50**	**60**	**10**	**90**	**10**	**90**	**125**	**60**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
20	Belvoir Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		62	0	9	0	0	0	18	55	0	0	28	19
B	Sum of Approach Vol			71			0			73			47	
C	Dist of Approach Vol		87%	0%	13%	0%	0%	0%	25%	75%	0%	0%	60%	40%
D	Approach Growth Factor			0%			0%			0%			220%	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			71			0			73		**150**	**48**	**99**
F	Vol Based on Entry Dist. = C x E		62	0	9	0	0	0	18	55	0	**0**	**59**	**40**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	18	0	19	62	55	0	0	28	9
H	Sum of Exit Vol			0			37			117			37	
J	Dist of Exit Vol		0%	0%	0%	49%	0%	51%	53%	47%	0%	0%	76%	24%
K	Exit Growth Factor			0%			0%			0%			0%	
L	New Exit Vol Sum = H x K			0			37			117			37	
M	Vol Based on Exit Dist = J x L		0	0	0	18	0	19	62	55	0	0	28	9
N	Transpose Exit Vols (EBL…SBR)		62	0	9	0	0	0	18	55	0	0	28	19
O	Average Entry & Exit Vols = (F+N)/2		**62**	**0**	**9**	**0**	**0**	**0**	**18**	**55**	**0**	**0**	**44**	**30**
P	Revised Sum of Approach Vol			71			0			73			73	
R	Revised Dist of Approach Vol		87%	0%	13%	0%	0%	0%	25%	75%	0%	0%	60%	40%
	Rounded Volumes		**60**	**0**	**10**	**0**	**0**	**0**	**20**	**60**	**0**	**0**	**50**	**30**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes			1/30/2014										
	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
21	Theote Rd	Pohick Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	835	624	1	137	0	56	0	19	0	0	0
B	Sum of Approach Vol			1459			138			75			0	
C	Dist of Approach Vol		0%	57%	43%	1%	99%	0%	75%	0%	25%	0%	0%	0%
D	Approach Growth Factor			-37%			164%			33%		0%		
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			925			364			100			0	
F	Vol Based on Entry Dist. = C x E		0	529	395.5251	3	362	0	75	0	25	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	835	19	56	137	0	0	0	0	1	0	624
H	Sum of Exit Vol			854			193			0			625	
J	Dist of Exit Vol		0%	98%	2%	29%	71%	0%	0%	0%	0%	0%	0%	100%
K	Exit Growth Factor			14%			-21%			0%			2%	
L	New Exit Vol Sum = H x K			975			152			0			639	
M	Vol Based on Exit Dist = J x L		0	953	22	44	108	0	0	0	0	1	0	638
N	Transpose Exit Vols (EBL…SBR)		0	953	638	1	108	0	44	0	22	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**741**	**517**	**2**	**235**	**0**	**59**	**0**	**24**	**0**	**0**	**0**
P	Revised Sum of Approach Vol		1258			236			83			0		
R	Revised Dist of Approach Vol		0%	59%	41%	1%	99%	0%	72%	0%	28%	0%	0%	0%
	Rounded Volumes		**0**	**750**	**525**	**0**	**225**	**0**	**60**	**0**	**30**	**0**	**0**	**0**

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
22	Theote Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		2	35	8	21	17	17	4	42	6	78	445	16
B	Sum of Approach Vol			45			55			52			539	
C	Dist of Approach Vol		4%	78%	18%	38%	31%	31%	8%	81%	12%	14%	83%	3%
D	Approach Growth Factor			0%			0%			33%			2%	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			45			55			69			551	
F	Vol Based on Entry Dist. = C x E		2	35	8	21	17	17	5	56	8	80	455	16
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		78	35	6	4	17	16	2	42	17	21	445	8
H	Sum of Exit Vol			119			37			61			474	
J	Dist of Exit Vol		66%	29%	5%	11%	46%	43%	3%	69%	28%	4%	94%	2%
K	Exit Growth Factor			0%			0%			33%			2%	
L	New Exit Vol Sum = H x K			119			37			81			485	
M	Vol Based on Exit Dist = J x L		78	35	6	4	17	16	3	56	23	21	455	8
N	Transpose Exit Vols (EBL…SBR)		3	35	8	21	17	23	4	56	6	78	455	16
O	Average Entry & Exit Vols = (F+N)/2		**2**	**35**	**8**	**21**	**17**	**20**	**5**	**56**	**7**	**79**	**455**	**16**
P	Revised Sum of Approach Vol			45			58			68			550	
R	Revised Dist of Approach Vol		5%	77%	18%	37%	29%	34%	7%	83%	10%	14%	83%	3%
	Rounded Volumes		0	40	10	20	20	20	10	60	10	80	450	20

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
23	Flagler Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		25	198	5	2	173	18	16	0	14	6	0	12
B	Sum of Approach Vol			228			193			30			18	
C	Dist of Approach Vol		11%	87%	2%	1%	90%	9%	53%	0%	47%	33%	0%	67%
D	Approach Growth Factor			-57%			-37%			0%			-15%	
E	New Approach Vol Sum = B x D			98			122			30			15	
F	Vol Based on Entry Dist. = C x E		11	85	2.150259	1	110	11	16	0	14	5	0	10
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		6	198	14	16	173	12	25	0	18	2	0	5
H	Sum of Exit Vol			218			201			43			7	
J	Dist of Exit Vol		3%	91%	6%	8%	86%	6%	58%	0%	42%	29%	0%	71%
K	Exit Growth Factor			-59%			-36%			-11%			0%	
L	New Exit Vol Sum = H x K			89			129			38			7	
M	Vol Based on Exit Dist = J x L		2	81	6	10	111	8	22	0	16	2	0	5
N	Transpose Exit Vols (EBL…SBR)		22	81	5	2	111	16	10	0	6	2	0	8
O	Average Entry & Exit Vols = (F+N)/2		**16**	**83**	**4**	**2**	**111**	**14**	**13**	**0**	**10**	**4**	**0**	**9**
P	Revised Sum of Approach Vol			103			126			23			13	
R	Revised Dist of Approach Vol		16%	81%	3%	1%	88%	11%	57%	0%	43%	30%	0%	70%
	Rounded Volumes		**20**	**80**	**10**	**0**	**125**	**20**	**10**	**0**	**10**	**10**	**0**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
24	Mt Vernon Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		53	0	19	0	0	0	1	141	0	0	358	61
B	Sum of Approach Vol			72			0			142			419	
C	Dist of Approach Vol		74%	0%	26%	0%	0%	0%	1%	99%	0%	0%	85%	15%
D	Approach Growth Factor			42%			0%			-54%			-29%	
E	New Approach Vol Sum = B x D			102			0			65			298	
F	Vol Based on Entry Dist. = C x E		75	0	26.90719	0	0	0	0	65	0	0	255	43
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	1	0	61	53	141	0	0	358	19
H	Sum of Exit Vol			0			62			194			377	
J	Dist of Exit Vol		0%	0%	0%	2%	0%	98%	27%	73%	0%	0%	95%	5%
K	Exit Growth Factor			0%			23%			-9%			-48%	
L	New Exit Vol Sum = H x K			0			76			177			197	
M	Vol Based on Exit Dist = J x L		0	0	0	1	0	75	48	129	0	0	187	10
N	Transpose Exit Vols (EBL…SBR)		48	0	10	0	0	0	1	129	0	0	187	75
O	Average Entry & Exit Vols = (F+N)/2		**62**	**0**	**18**	**0**	**0**	**0**	**1**	**97**	**0**	**0**	**221**	**59**
P	Revised Sum of Approach Vol			80			0			98			280	
R	Revised Dist of Approach Vol		77%	0%	23%	0%	0%	0%	1%	99%	0%	0%	79%	21%
	Rounded Volumes		**60**	**0**	**20**	**0**	**0**	**0**	**0**	**100**	**0**	**0**	**225**	**60**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes			1/30/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	**NS Street**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
25	**Mt Vernon Rd**	**Gillespie Rd**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		14	11	0	3	23	36	9	178	61	0	70	3
B	**Sum of Approach Vol**			25			62			248			73	
C	**Dist of Approach Vol**		56%	44%	0%	5%	37%	58%	4%	72%	25%	0%	96%	4%
D	**Approach Growth Factor**			28%			0%			-59%			-48%	
E	**New Approach Vol Sum = B x D**			32			62			101			38	
F	**Vol Based on Entry Dist. = C x E**		18	14	0	3	23	36	4	73	25	0	37	2
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		0	11	61	9	23	3	14	178	36	3	70	0
H	**Sum of Exit Vol**			72			35			228			73	
J	**Dist of Exit Vol**		0%	15%	85%	26%	66%	9%	6%	78%	16%	4%	96%	0%
K	**Exit Growth Factor**			0%			0%			-54%			-37%	
L	**New Exit Vol Sum = H x K**			72			35			105			46	
M	**Vol Based on Exit Dist = J x L**		0	11	61	9	23	3	6	82	17	2	44	0
N	**Transpose Exit Vols (EBL…SBR)**		6	11	0	2	23	17	9	82	61	0	44	3
O	**Average Entry & Exit Vols = (F+N)/2**		**12**	**13**	**0**	**2**	**23**	**26**	**6**	**77**	**43**	**0**	**40**	**2**
P	**Revised Sum of Approach Vol**			25			52			127			43	
R	**Revised Dist of Approach Vol**		49%	51%	0%	5%	44%	51%	5%	61%	34%	0%	95%	5%
	Rounded Volumes		**10**	**10**	**0**	**0**	**20**	**30**	**10**	**80**	**40**	**0**	**40**	**0**
Site	**NS Street**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
26	**Gunston Rd**	**3rd St**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		1	0	1	6	0	2	2	415	36	37	663	3
B	**Sum of Approach Vol**			2			8			453			703	
C	**Dist of Approach Vol**		0%	0%	0%	75%	0%	25%	0%	92%	8%	5%	94%	0%
D	**Approach Growth Factor**			0%			0%			3%			152%	
E	**New Approach Vol Sum = B x D**			2			8			468			1772	
F	**Vol Based on Entry Dist. = C x E**		0	0	0	6	0	2	2	429	37	93	1671	8
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		37	0	36	2	0	3	1	415	2	6	663	1
H	**Sum of Exit Vol**			73			5			418			670	
J	**Dist of Exit Vol**		51%	0%	49%	40%	0%	60%	0%	99%	0%	1%	99%	0%
K	**Exit Growth Factor**			0%			0%			25%			159%	
L	**New Exit Vol Sum = H x K/H+abs/Avg (2)**			73			5			522		**1733**	**1645**	**1689**
M	**Vol Based on Exit Dist = J x L**		37	0	36	2	0	3	1	519	2	**15**	**1671**	**3**
N	**Transpose Exit Vols (EBL…SBR)**		1	0	3	15	0	2	2	519	36	37	1671	3
O	**Average Entry & Exit Vols = (F+N)/2**		**1**	**0**	**1**	**11**	**0**	**2**	**2**	**474**	**37**	**65**	**1671**	**5**
P	**Revised Sum of Approach Vol**			2			13			512			1741	
R	**Revised Dist of Approach Vol**		33%	0%	67%	82%	0%	18%	0%	92%	7%	4%	96%	0%
	Rounded Volumes		**0**	**0**	**0**	**10**	**0**	**0**	**0**	**475**	**40**	**70**	**1675**	**10**
2	**Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.**													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - AM No-Build											
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
27	Gunston Rd	Jackson Loop S.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		36	0	16	0	0	0	52	491	0	0	516	52
B	Sum of Approach Vol			52			0			543			568	
C	Dist of Approach Vol		69%	0%	31%	0%	0%	0%	10%	90%	0%	0%	91%	9%
D	Approach Growth Factor			0%			0%			-4%			157%	
E	New Approach Vol Sum = B x D			52			0			520			1461	
F	Vol Based on Entry Dist. = C x E		36	0	16	0	0	0	50	471	0	0	1327	134
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	52	0	52	36	491	0	0	516	16
H	Sum of Exit Vol			0			104			527			532	
J	Dist of Exit Vol		0%	0%	0%	50%	0%	50%	7%	93%	0%	0%	97%	3%
K	Exit Growth Factor			0%			0%			9%			166%	
L	New Exit Vol Sum = H x K			0			104			575			1417	
M	Vol Based on Exit Dist = J x L		0	0	0	52	0	52	39	536	0	0	1374	43
N	Transpose Exit Vols (EBL…SBR)		39	0	43	0	0	0	52	536	0	0	1374	52
O	Average Entry & Exit Vols = (F+N)/2		**38**	**0**	**29**	**0**	**0**	**0**	**51**	**503**	**0**	**0**	**1351**	**93**
P	Revised Sum of Approach Vol			67			0			554			1443	
R	Revised Dist of Approach Vol		56%	0%	44%	0%	0%	0%	9%	91%	0%	0%	94%	6%
	Rounded Volumes		**40**	**0**	**30**	**0**	**0**	**0**	**50**	**500**	**0**	**0**	**1350**	**90**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1								
	Growth Factors Based on Peak Period Link Volumes												
	1/30/2014	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)		>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	**NS Steet**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
1	**DLA West Gate**	**Kingman Rd**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		0	819	720	51	143	0	52	0	28	0	0	0
B	**Sum of Approach Vol**			1539			194			80			0	
C	**Dist of Approach Vol**		0%	53%	47%	26%	74%	0%	65%	0%	35%	0%	0%	0%
D	**Approach Growth Factor**			13.3%			55%			22%			0%	
E	**New Approach Vol Sum = B x D**			1744			302			98			0	
F	**Vol Based on Entry Dist. = C x E**		0	928	816	79	222	0	63	0	34	0	0	0
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		0	819	28	52	143	0	0	0	0	51	0	720
H	**Sum of Exit Vol**			847			195			0			771	
J	**Dist of Exit Vol**		0%	97%	3%	27%	73%	0%	0%	0%	0%	7%	0%	93%
K	**Exit Growth Factor**			27%			-13%			0%			19%	
L	**New Exit Vol Sum = H x K**			1077			169			0			916	
M	**Vol Based on Exit Dist = J x L**		0	1041	36	45	124	0	0	0	0	61	0	855
N	**Transpose Exit Vols (EBL…SBR)**		0	1041	855	61	124	0	45	0	36	0	0	0
O	**Average Entry & Exit Vols = (F+N)/2**		0	985	836	70	173	0	54	0	35	0	0	0
P	**Revised Sum of Approach Vol**			1820			243			89			0	
R	**Revised Dist of Approach Vol**		0%	54%	46%	29%	71%	0%	61%	0%	39%	0%	0%	0%
	Rounded Volumes		**0**	**975**	**850**	**70**	**175**	**0**	**60**	**0**	**40**	**0**	**0**	**0**
Site	**NS Steet**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
2	**DLA East Gate**	**Kingman Rd**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		0	812	291	312	145	0	29	0	23	0	0	0
B	**Sum of Approach Vol**			1103			457			52			0	
C	**Dist of Approach Vol**		0%	74%	26%	68%	32%	0%	56%	0%	44%	0%	0%	0%
D	**Approach Growth Factor**			27%			151%			23%			0%	
E	**New Appch Vol Sum = B x D/B+abs/Avg (1)**			1402		**1148**	**916**	**1032**		64			0	
F	**Vol Based on Entry Dist. = C x E**		0	1032	370	**704**	**327**	**0**	36	0	28	0	0	0
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
Balance out on			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		0	812	23	29	145	0	0	0	0	312	0	291
H	**Sum of Exit Vol**			835			174			0			603	
J	**Dist of Exit Vol**		0%	97%	3%	17%	83%	0%	0%	0%	0%	52%	0%	48%
K	**Exit Growth Factor**			57%			56%			0%			19%	
L	**New Exit Vol Sum = H x K**			1309			271			0			716	
M	**Vol Based on Exit Dist = J x L**		0	1273	36	45	226	0	0	0	0	371	0	346
N	**Transpose Exit Vols (EBL…SBR)**		0	1273	346	371	226	0	45	0	36	0	0	0
O	**Average Entry & Exit Vols = (F+N)/2**		0	1153	358	538	276	0	40	0	32	0	0	0
P	**Revised Sum of Approach Vol**			1510			814			73			0	
R	**Revised Dist of Approach Vol**		0%	76%	24%	66%	34%	0%	56%	0%	44%	0%	0%	0%
	Rounded Volumes		**0**	**1150**	**350**	**475**	**225**	**0**	**40**	**0**	**30**	**0**	**0**	**0**
1	**Entry volumes for westbound approach based on a average of Absolute and growth factor increase.**													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
	Growth Factors Based on Peak Period Link Volumes													
	1/30/2014		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
3	Beulah St	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		29	509	153	59	150	115	7	19	27	534	108	229
B	Sum of Approach Vol			691			324			53			871	
C	Dist of Approach Vol		4%	74%	22%	18%	46%	35%	13%	36%	51%	61%	12%	26%
D	Approach Growth Factor			57%			90%			43%			-5%	
E	New Approach Vol Sum = B x D			1083			614			76			825	
F	Vol Based on Entry Dist. = C x E		45	798	240	112	284	218	10	27	39	506	102	217
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
Balance out on			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		534	509	27	7	150	229	29	19	115	59	108	153
H	Sum of Exit Vol			1070			386			163			320	
J	Dist of Exit Vol		50%	48%	3%	2%	39%	59%	18%	12%	71%	18%	34%	48%
K	Exit Growth Factor			17%			151%			12%			57%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			1252		**969**	**845**	**907**		182			504	
M	Vol Based on Exit Dist = J x L		625	596	32	**16**	**352**	**538**	32	21	129	93	170	241
N	Transpose Exit Vols (EBL…SBR)		32	596	241	93	352	129	16	21	32	625	170	538
O	Average Entry & Exit Vols = (F+N)/2		39	697	240	102	318	173	13	24	35	565	136	377
P	Revised Sum of Approach Vol			976			594			73			1079	
R	Revised Sist of Approach Vol		4%	71%	25%	17%	54%	29%	18%	33%	48%	52%	13%	35%
	Rounded Volumes		**40**	**700**	**250**	**100**	**325**	**175**	**20**	**30**	**40**	**575**	**150**	**375**
2	Volumes for westbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
4	Gunston Rd	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	9	1067	11	17	0	373	0	16	0	0	0
B	Sum of Approach Vol			**1076**			**28**			**389**			**0**	
C	Dist of Approach Vol		**0%**	**1%**	**99%**	**39%**	**61%**	**0%**	**96%**	**0%**	**4%**	**0%**	**0%**	**0%**
D	Approach Growth Factor			17%			-25%			134%			0%	
E	New Appch Vol Sum = B x D			1259			21			911			0	
F	Vol Based on Entry Dist. = C x E		0	11	1248.565	8	13	0	873	0	37	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	9	16	373	17	0	0	0	0	11	0	1067
H	Sum of Exit Vol			25			390			0			1078	
J	Dist of Exit Vol		0%	36%	64%	96%	4%	0%	0%	0%	0%	1%	0%	99%
K	Exit Growth Factor			-87%			90%			0%			76%	
L	New Exit Vol Sum = H x K			3			739			0			1902	
M	Vol Based on Exit Dist = J x L		0	1	2	707	32	0	0	0	0	19	0	1883
N	Transpose Exit Vols (EBL…SBR)		0	1	1883	19	32	0	707	0	2	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	6	1566	14	22	0	790	0	20	0	0	0
P	Revised Sum of Approach Vol			1572			36			810			0	
R	Revised Dist of Approach Vol		0%	0%	100%	38%	62%	0%	98%	0%	2%	0%	0%	0%
	Rounded Volumes		**99**	**10**	**1575**	**20**	**20**	**0**	**800**	**0**	**20**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
	Growth Factors Based on Peak Period Link Volumes													
	1/30/2014		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
5	Woodlawn	Gorgas	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		6	89	21	1	106	3	42	2	1	5	0	16
B	Sum of Approach Vol			116			110			45			21	
C	Dist of Approach Vol		5%	77%	18%	1%	96%	3%	93%	4%	2%	24%	0%	76%
D	Approach Growth Factor		0%				0%			-25%			-87%	
E	New Approach Vol Sum = B x D			116			110			34			3	
F	Vol Based on Entry Dist. = C x E		6	89	21	1	106	3	32	2	1	1	0	2
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		5	89	1	42	106	16	6	2	3	1	0	21
H	Sum of Exit Vol			95			164			11			22	
J	Dist of Exit Vol		5%	94%	1%	26%	65%	10%	55%	18%	27%	5%	0%	95%
K	Exit Growth Factor			0%			0%			-25%			-87%	
L	New Exit Vol Sum = H x K			95			164			8			3	
M	Vol Based on Exit Dist = J x L		5	89	1	42	106	16	4	1	2	0	0	3
N	Transpose Exit Vols (EBL…SBR)		4	89	3	0	106	2	42	1	1	5	0	16
O	Average Entry & Exit Vols = (F+N)/2		5	89	12	1	106	3	37	2	1	3	0	9
P	Revised Sum of Approach Vol			106			109			39			12	
R	Revised Dist of Approach Vol		5%	84%	11%	1%	97%	2%	94%	4%	2%	24%	0%	76%
	Rounded Volumes		**10**	**90**	**10**	**0**	**100**	**0**	**40**	**0**	**0**	**0**	**0**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
6	Gunston Rd	Abbott Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		5	5	3	103	3	54	29	338	55	37	887	67
B	Sum of Approach Vol			13			160			422			991	
C	Dist of Approach Vol		38%	38%	23%	64%	2%	34%	7%	80%	13%	4%	90%	7%
D	Approach Growth Factor			0%			-49%			**320%**			**97%**	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			13			82		**1772**	**1673**	**1722**		**1947**	
F	Vol Based on Entry Dist. = C x E		5	5	3	53	2	28	**118**	**1380**	**224**	**73**	**1743**	**132**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		37	5	55	29	3	67	5	338	54	103	887	3
H	Sum of Exit Vol			97			99			397			993	
J	Dist of Exit Vol		38%	5%	57%	29%	3%	68%	1%	85%	14%	10%	89%	0%
K	Exit Growth Factor			-64%			0%			**163%**			**167%**	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			35			99		**1043**	**866**	**954**	**2649**	**1981**	**2315**
M	Vol Based on Exit Dist = J x L		13	2	20	29	3	67	12	812	130	240	2068	7
N	Transpose Exit Vols (EBL…SBR)		12	2	7	240	3	130	29	812	20	13	2068	67
O	Average Entry & Exit Vols = (F+N)/2		9	3	5	146	2	79	74	1096	122	43	1905	99
P	Revised Sum of Approach Vol			17			227			1292			2048	
R	Revised Dist of Approach Vol		50%	20%	30%	64%	1%	35%	6%	85%	9%	2%	93%	5%
	Rounded Volumes		**10**	**0**	**10**	**175**	**0**	**90**	**80**	**1150**	**125**	**10**	**1175**	**40**
1	Entry volumes for northbound approach based on a average of absolute and growth factor increase.													
2	Volumes for northbound and southbound exits based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS						Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1								
	Growth Factors Based on Peak Period Link Volumes													
		1/30/2014	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
7	Gunston Rd	Goethals Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		9	1	6	56	2	18	22	402	56	65	940	18
B	Sum of Approach Vol			16			76			480			1023	
C	Dist of Approach Vol		56%	6%	38%	74%	3%	24%	5%	84%	12%	6%	92%	2%
D	Approach Growth Factor			0%			209%			315%			167%	
E	New Approach Vol Sum = B x D			16			235			1992			2729	
F	Vol Based on Entry Dist. = C x E		9	1	6	173	10	56	91	1668	232	173	2508	48
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		65	1	56	22	2	18	9	402	18	56	940	6
H	Sum of Exit Vol			122			42			429			1002	
J	Dist of Exit Vol		53%	1%	46%	52%	5%	43%	2%	94%	4%	6%	94%	1%
K	Exit Growth Factor			**640%**			0%			**320%**			**112%**	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)		**903**	**662**	**782**		42		**1801**	**951**	**1376**	**2125**	**1876**	**2000**
M	Vol Based on Exit Dist = J x L		**417**	**6**	**359**	22	2	18	**29**	**1289**	**58**	**112**	**1876**	**12**
N	Transpose Exit Vols (EBL…SBR)		29	6	12	112	2	58	22	1289	359	417	1876	18
O	Average Entry & Exit Vols = (F+N)/2		19	4	9	142	6	57	57	1479	296	295	2192	33
P	Revised Sum of Approach Vol			32			205			1831			2520	
R	Revised Dist of Approach Vol		60%	12%	28%	69%	3%	28%	3%	81%	16%	12%	87%	1%
	Rounded Volumes		**20**	**10**	**10**	**150**	**10**	**70**	**60**	**1675**	**325**	**325**	**2250**	**30**
2	Volumes for eastbound, northbound and southbound exits based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
8	Gunston Rd	1st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	15	0	127	0	401	23	330	686	0
B	Sum of Approach Vol			0			142			424			1016	
C	Dist of Approach Vol		0%	0%	0%	11%	0%	89%	0%	95%	5%	32%	68%	0%
D	Approach Growth Factor			0%			0%			28%			148%	
E	New Approach Vol Sum = B x D			0			142			543			2521	
F	Vol Based on Entry Dist. = C x E		0	0	0	15	0	127	0	514	29	819	1703	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		330	0	23	0	0	0	0	401	127	15	686	0
H	Sum of Exit Vol			353			0			528			701	
J	Dist of Exit Vol		93%	0%	7%	0%	0%	0%	0%	76%	24%	2%	98%	0%
K	Exit Growth Factor			0%			0%			28%			148%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			353			0			676		**1740**	**1723**	**1732**
M	Vol Based on Exit Dist = J x L		330	0	23	0	0	0	0	514	163	**37**	**1695**	**0**
N	Transpose Exit Vols (EBL…SBR)		0	0	0	37	0	163	0	514	23	330	1695	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	26	0	145	0	514	26	574	1699	0
P	Revised Sum of Approach Vol			0			171			540			2273	
R	Revised Dist of Approach Vol		0%	0%	0%	15%	0%	85%	0%	95%	5%	25%	75%	0%
	Rounded Volumes		**0**	**0**	**0**	**30**	**0**	**150**	**0**	**525**	**30**	**575**	**1700**	**0**
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1								
	Growth Factors Based on Peak Period Link Volumes												
	1/30/2014		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
9	Gunston Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	8	0	103	0	562	52	79	488	0
B	Sum of Approach Vol			0			111			614			567	
C	Dist of Approach Vol		0%	0%	0%	7%	0%	93%	0%	92%	8%	14%	86%	0%
D	Approach Growth Factor			0%			-100%			**113%**			162%	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			0			0		**1307**	**1159**	**1233**		1484	
F	Vol Based on Entry Dist. = C x E		0	0	0	0	0	0	**0**	**1129**	**104**	207	1277	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		79	0	52	0	0	0	0	562	103	8	488	0
H	Sum of Exit Vol			131			0			665			496	
J	Dist of Exit Vol		60%	0%	40%	0%	0%	0%	0%	85%	15%	2%	98%	0%
K	Exit Growth Factor			-99%			0%			-1%			**227%**	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			1			0			655		**1620**	**1392**	**1506**
M	Vol Based on Exit Dist = J x L		0	0	0	0	0	0	0	554	102	**24**	**1482**	**0**
N	Transpose Exit Vols (EBL…SBR)		0	0	0	24	0	102	0	554	0	0	1482	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	12	0	51	0	841	52	104	1380	0
P	Revised Sum of Approach Vol			0			63			894			1483	
R	Revised Dist of Approach Vol		0%	0%	0%	19%	0%	81%	0%	94%	6%	7%	93%	0%
	Rounded Volumes		**0**	**0**	**0**	**10**	**0**	**50**	**0**	**875**	**60**	**100**	**1450**	**0**
1	Entry volumes for northbound approach based on a average of absolute and growth factor increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
10	Gunston Rd	Pohick Rd/12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		312	310	231	83	60	164	36	129	41	159	278	43
B	Sum of Approach Vol			853			307			206			480	
C	Dist of Approach Vol		37%	36%	27%	27%	20%	53%	17%	63%	20%	33%	58%	9%
D	Approach Growth Factor			19%			1%			40%			227%	
E	New Approach Vol Sum = B x D			1018			310			289			1568	
F	Vol Based on Entry Dist. = C x E		372	370	275.633	84	61	166	51	181	58	519	908	140
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		159	310	41	36	60	43	312	129	164	83	278	231
H	Sum of Exit Vol			510			139			605			592	
J	Dist of Exit Vol		31%	61%	8%	26%	43%	31%	52%	21%	27%	14%	47%	39%
K	Exit Growth Factor			19%			153%			**113%**			8%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			609			352		**1288**	**832**	**1060**		642	
M	Vol Based on Exit Dist = J x L		190	370	49	91	152	109	**547**	**226**	**287**	90	302	251
N	Transpose Exit Vols (EBL…SBR)		547	370	251	90	152	287	91	226	49	190	302	109
O	Average Entry & Exit Vols = (F+N)/2		459	370	263	87	106	227	71	204	53	355	605	125
P	Revised Sum of Approach Vol			1092			420			328			1084	
R	Revised Dist of Approach Vol		42%	34%	24%	21%	25%	54%	22%	62%	16%	33%	56%	12%
	Rounded Volumes		**525**	**375**	**275**	**90**	**100**	**250**	**70**	**225**	**50**	**350**	**600**	**125**
2	Volumes for northbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
	Growth Factors Based on Peak Period Link Volumes													
	1/30/2014		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
11	Gunston Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		38	44	20	3	33	41	4	74	7	97	355	58
B	Sum of Approach Vol			102			77			85			510	
C	Dist of Approach Vol		37%	43%	20%	4%	43%	53%	5%	87%	8%	19%	70%	11%
D	Approach Growth Factor			0%			0%			40%			8%	
E	New Approach Vol Sum = B x D			102			77			119			553	
F	Vol Based on Entry Dist. = C x E		38	44	20	3	33	41	6	104	10	105	385	63
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		97	44	7	4	33	58	38	74	41	3	355	20
H	Sum of Exit Vol			148			95			153			378	
J	Dist of Exit Vol		66%	30%	5%	4%	35%	61%	25%	48%	27%	1%	94%	5%
K	Exit Growth Factor			0%			0%			40%			8%	
L	New Exit Vol Sum = H x K			148			95			215			410	
M	Vol Based on Exit Dist = J x L		97	44	7	4	33	58	53	104	58	3	385	22
N	Transpose Exit Vols (EBL…SBR)		53	44	22	3	33	58	4	104	7	97	385	58
O	Average Entry & Exit Vols = (F+N)/2		46	44	21	3	33	49	5	104	8	101	385	60
P	Revised Sum of Approach Vol			111			85			117			547	
R	Revised Dist of Approach Vol		41%	40%	19%	4%	39%	58%	4%	89%	7%	18%	70%	11%
	Rounded Volumes		**50**	**50**	**20**	**0**	**30**	**50**	**10**	**100**	**10**	**100**	**375**	**60**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
12	Gunston Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		22	2	441	0	1	0	37	46	1	0	174	8
B	Sum of Approach Vol			465			1			84			182	
C	Dist of Approach Vol		5%	0%	95%	0%	100%	0%	44%	55%	1%	0%	96%	4%
D	Approach Growth Factor			0%			7%			8%			8%	
E	New Approach Vol Sum = B x D			465			1			91			197	
F	Vol Based on Entry Dist. = C x E		22	2	441	0	1	0	40	50	1	0	189	9
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	2	1	37	1	8	22	46	0	0	174	441
H	Sum of Exit Vol			3			46			68			615	
J	Dist of Exit Vol		0%	67%	33%	80%	2%	17%	32%	68%	0%	0%	28%	72%
K	Exit Growth Factor			-37%			0%			40%			8%	
L	New Exit Vol Sum = H x K			2			46			96			664	
M	Vol Based on Exit Dist = J x L		0	1	1	37	1	8	31	65	0	0	188	476
N	Transpose Exit Vols (EBL…SBR)		31	1	476	0	1	0	37	65	1	0	188	8
O	Average Entry & Exit Vols = (F+N)/2		26	2	459	0	1	0	39	57	1	0	188	8
P	Revised Sum of Approach Vol			487			1			97			197	
R	Revised Dist of Approach Vol		5%	0%	94%	0%	100%	0%	40%	59%	1%	0%	96%	4%
	Rounded Volumes		**30**	**0**	**450**	**0**	**0**	**0**	**40**	**60**	**0**	**0**	**200**	**10**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
	Growth Factors Based on Peak Period Link Volumes													
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	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
13	Gunston Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	103	0	41	0	29	13	75	444	0
B	Sum of Approach Vol			0			144			42			519	
C	Dist of Approach Vol		0%	0%	0%	72%	0%	28%	0%	69%	31%	14%	86%	0%
D	Approach Growth Factor			0%			0%			8%			8%	
E	New Approach Vol Sum = B x D			0			144			45			560	
F	Vol Based on Entry Dist. = C x E		0	0	0	103	0	41	0	31	14	81	479	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		75	0	13	0	0	0	0	29	41	103	444	0
H	Sum of Exit Vol			88			0			70			547	
J	Dist of Exit Vol		85%	0%	15%	0%	0%	0%	0%	41%	59%	19%	81%	0%
K	Exit Growth Factor			0%			0%			8%			8%	
L	New Exit Vol Sum = H x K			88			0			76			590	
M	Vol Based on Exit Dist = J x L		75	0	13	0	0	0	0	31	44	111	479	0
N	Transpose Exit Vols (EBL…SBR)		0	0	0	111	0	44	0	31	13	75	479	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	107	0	43	0	31	14	78	479	0
P	Revised Sum of Approach Vol			0			150			45			557	
R	Revised Dist of Approach Vol		0%	0%	0%	72%	0%	28%	0%	70%	30%	14%	86%	0%
	Rounded Volumes		**0**	**0**	**0**	**100**	**0**	**40**	**0**	**30**	**20**	**80**	**475**	**0**
Site			Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
14	Belvoir Hospital Traffic Circle		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		90	2	46	3	1	1	151	142	14	5	458	519
B	Sum of Approach Vol			138			5			307			982	
C	Dist of Approach Vol		65%	1%	33%	60%	20%	20%	49%	46%	5%	1%	47%	53%
D	Approach Growth Factor			0%			0%			-20%			-25%	
E	New Approach Vol Sum = B x D			138			5			245			737	
F	Vol Based on Entry Dist. = C x E		90	2	46	3	1	1	120	113	11	4	344	389
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		5	2	14	151	1	519	90	142	1	3	458	46
H	Sum of Exit Vol			21			671			233			507	
J	Dist of Exit Vol		24%	10%	67%	23%	0%	77%	39%	61%	0%	1%	90%	9%
K	Exit Growth Factor			0%			0%			-20%			-25%	
L	New Exit Vol Sum = H x K			21			671			186			380	
M	Vol Based on Exit Dist = J x L		5	2	14	151	1	519	72	113	1	2	344	35
N	Transpose Exit Vols (EBL…SBR)		72	2	35	2	1	1	151	113	14	5	344	519
O	Average Entry & Exit Vols = (F+N)/2		81	2	40	3	1	1	136	113	13	4	344	454
P	Revised Sum of Approach Vol			123			5			262			802	
R	Revised Dist of Approach Vol		66%	2%	33%	58%	22%	20%	52%	43%	5%	1%	43%	57%
	Rounded Volumes		**80**	**0**	**40**	**0**	**0**	**0**	**150**	**125**	**10**	**10**	**350**	**450**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1										
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	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols			
15	Belvoir Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
A	Existing Volume		15	13	66	0	0	0	134	145	52	0	528	91	
B	Sum of Approach Vol			94			0			331			619		
C	Dist of Approach Vol		16%	14%	70%	0%	0%	0%	40%	44%	16%	0%	85%	15%	
D	Approach Growth Factor			0%			-29%			-16%			-25%		
E	New Approach Vol Sum = B x D			94			0			278			465		
F	Vol Based on Entry Dist. = C x E		15	13	66	0	0	0	112	122	44	0	396	68	
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols			
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR	
G	Existing Exit Vol		0	13	52	134	0	91	15	145	0	0	528	66	
H	Sum of Exit Vol			65			225			160			594		
J	Dist of Exit Vol		0%	20%	80%	60%	0%	40%	9%	91%	0%	0%	89%	11%	
K	Exit Growth Factor			-25%			0%			-20%			-26%		
L	New Exit Vol Sum = H x K			49			225			128			442		
M	Vol Based on Exit Dist = J x L		0	10	39	134	0	91	12	116	0	0	393	49	
N	Transpose Exit Vols (EBL…SBR)		12	10	49	0	0	0	134	116	39	0	393	91	
O	Average Entry & Exit Vols = (F+N)/2		13	11	58	0	0	0	123	119	41	0	395	80	
P	Revised Sum of Approach Vol			82			0			283			474		
R	Revised Dist of Approach Vol		16%	14%	70%	0%	0%	0%	44%	42%	15%	0%	83%	17%	
	Rounded Volumes		**10**	**10**	**60**	**0**	**0**	**0**	**125**	**125**	**40**	**0**	**400**	**80**	
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols			
16	Belvoir Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
A	Existing Volume		106	10	29	7	10	11	34	268	4	18	409	121	
B	Sum of Approach Vol			145			28			306			548		
C	Dist of Approach Vol		73%	7%	20%	25%	36%	39%	11%	88%	1%	3%	75%	22%	
D	Approach Growth Factor			-99%			-99%			-1%			-26%		
E	New Approach Vol Sum = B x D			1			0			302			408		
F	Vol Based on Entry Dist. = C x E		1	0	0.176829	0	0	0	34	264	4	13	304	90	
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols			
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR	
G	Existing Exit Vol		18	10	4	34	10	121	106	268	11	7	409	29	
H	Sum of Exit Vol			32			165			385			445		
J	Dist of Exit Vol		56%	31%	13%	21%	6%	73%	28%	70%	3%	2%	92%	7%	
K	Exit Growth Factor			-49%			-100%			-16%			-17%		
L	New Exit Vol Sum = H x K			16			1			323			371		
M	Vol Based on Exit Dist = J x L		9	5	2	0	0	0	89	225	9	6	341	24	
N	Transpose Exit Vols (EBL…SBR)		89	5	24	6	0	9	0	225	2	9	341	0	
O	Average Entry & Exit Vols = (F+N)/2		45	3	12	3	0	5	17	245	3	11	323	45	
P	Revised Sum of Approach Vol			60			8			264			379		
R	Revised Dist of Approach Vol		75%	4%	20%	38%	1%	61%	6%	93%	1%	3%	85%	12%	
	Rounded Volumes		**50**	**0**	**10**	**0**	**0**	**10**	**20**	**250**	**0**	**10**	**325**	**50**	

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
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	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
17	Belvoir Rd	12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		200	0	243	0	0	0	152	76	0	0	264	138
B	Sum of Approach Vol			443			0			228			402	
C	Dist of Approach Vol		45%	0%	55%	0%	0%	0%	67%	33%	0%	0%	66%	34%
D	Approach Growth Factor			-1%			0%			8%			-17%	
E	New Approach Vol Sum = B x D			438			0			246			335	
F	Vol Based on Entry Dist. = C x E		198	0	240	0	0	0	164	82	0	0	220	115
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	152	0	138	200	76	0	0	264	243
H	Sum of Exit Vol			0			290			276			507	
J	Dist of Exit Vol		0%	0%	0%	52%	0%	48%	72%	28%	0%	0%	52%	48%
K	Exit Growth Factor			0%			-34%			-1%			**258%**	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			0			191			272		**1814**	**641**	**1228**
M	Vol Based on Exit Dist = J x L		0	0	0	100	0	91	197	75	0	**0**	**639**	**588**
N	Transpose Exit Vols (EBL…SBR)		197	0	588	0	0	0	100	75	0	0	639	91
O	Average Entry & Exit Vols = (F+N)/2		198	0	414	0	0	0	132	78	0	0	430	103
P	Revised Sum of Approach Vol			612			0			210			533	
R	Revised Dist of Approach Vol		32%	0%	68%	0%	0%	0%	63%	37%	0%	0%	81%	19%
	Rounded Volumes		200	0	550	0	0	0	125	80	0	0	575	100
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
18	Belvoir Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		30	1	85	0	0	0	29	170	5	1	367	59
B	Sum of Approach Vol			116			0			204			427	
C	Dist of Approach Vol		26%	1%	73%	0%	0%	0%	14%	83%	2%	0%	86%	14%
D	Approach Growth Factor			0%			0%			8%			**258%**	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			116			0			220		**1528**	**749**	**1139**
F	Vol Based on Entry Dist. = C x E		30	1	85	0	0	0	31	183	5	**3**	**979**	**157**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		1	1	5	29	0	59	30	170	0	0	367	85
H	Sum of Exit Vol			7			88			200			452	
J	Dist of Exit Vol		14%	14%	71%	33%	0%	67%	15%	85%	0%	0%	81%	19%
K	Exit Growth Factor			0%			0%			8%			**258%**	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			7			88			215		**1617**	**586**	**1102**
M	Vol Based on Exit Dist = J x L		1	1	5	29	0	59	32	183	0	**0**	**895**	**207**
N	Transpose Exit Vols (EBL…SBR)		32	1	207	0	0	0	29	183	5	1	895	59
O	Average Entry & Exit Vols = (F+N)/2		31	1	146	0	0	0	30	183	5	2	937	108
P	Revised Sum of Approach Vol			178			0			218			1047	
R	Revised Dist of Approach Vol		17%	1%	82%	0%	0%	0%	14%	84%	2%	0%	89%	10%
	Rounded Volumes		30	0	200	0	0	0	30	175	10	0	1325	125
1	Entry volumes for southbound approach based on a average of absolute and growth factor increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS						Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1								
	Growth Factors Based on Peak Period Link Volumes													
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	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
19	Belvoir Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		16	16	2	85	58	68	7	88	17	51	57	29
B	Sum of Approach Vol			34			211			112			137	
C	Dist of Approach Vol		47%	47%	6%	40%	27%	32%	6%	79%	15%	37%	42%	21%
D	Approach Growth Factor			-37%			-24%			0%			**258%**	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			21			160			112		**490**	**459**	**475**
F	Vol Based on Entry Dist. = C x E		10	10	1.253886	64	44	51	7	88	17	**177**	**198**	**101**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		51	16	17	7	58	29	16	88	68	85	57	2
H	Sum of Exit Vol			84			94			172			144	
J	Dist of Exit Vol		61%	19%	20%	7%	62%	31%	9%	51%	40%	59%	40%	1%
K	Exit Growth Factor			-52%			7%			8%			0%	
L	New Exit Vol Sum = H x K			40			101			185			144	
M	Vol Based on Exit Dist = J x L		25	8	8	8	62	31	17	95	73	85	57	2
N	Transpose Exit Vols (EBL…SBR)		17	8	2	85	62	73	8	95	8	25	57	31
O	Average Entry & Exit Vols = (F+N)/2		14	9	2	75	53	62	7	91	13	101	127	66
P	Revised Sum of Approach Vol			24			190			111			294	
R	Revised Dist of Approach Vol		56%	37%	7%	39%	28%	33%	7%	82%	11%	34%	43%	22%
	Rounded Volumes		**20**	**10**	**0**	**80**	**50**	**60**	**10**	**90**	**10**	**100**	**125**	**70**
1	Entry volumes for southbound approach based on a average of absolute and growth factor increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
20	Belvoir Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		62	0	9	0	0	0	18	55	0	0	28	19
B	Sum of Approach Vol			71			0			73			47	
C	Dist of Approach Vol		87%	0%	13%	0%	0%	0%	25%	75%	0%	0%	60%	40%
D	Approach Growth Factor			0%			0%			0%			**220%**	
E	New Appch Vol Sum = B x D/B+abs/Avg (1)			71			0			73		**150**	**48**	**99**
NuDi	NuSum x E%Dist		62	0	9	0	0	0	18	55	0	**0**	**59**	**40**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	18	0	19	62	55	0	0	28	9
H	Sum of Exit Vol			0			37			117			37	
J	Dist of Exit Vol		0%	0%	0%	49%	0%	51%	53%	47%	0%	0%	76%	24%
K	Exit Growth Factor			0%			0%			0%			0%	
L	New Exit Vol Sum = H x K			0			37			117			37	
M	Vol Based on Exit Dist = J x L		0	0	0	18	0	19	62	55	0	0	28	9
N	Transpose Exit Vols (EBL…SBR)		62	0	9	0	0	0	18	55	0	0	28	19
O	Average Entry & Exit Vols = (F+N)/2		62	0	9	0	0	0	18	55	0	0	44	30
P	Revised Sum of Approach Vol			71			0			73			73	
R	Revised Dist of Approach Vol		87%	0%	13%	0%	0%	0%	25%	75%	0%	0%	60%	40%
	Rounded Volumes		**60**	**0**	**10**	**0**	**0**	**0**	**20**	**60**	**0**	**0**	**60**	**40**
1	Entry volumes for southbound approach based on a average of absolute and growth factor increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1										
	Growth Factors Based on Peak Period Link Volumes														
	1/30/2014		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values											
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols			
21	Theote Rd	Pohick Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
A	Existing Volume		0	835	624	1	137	0	56	0	19	0	0	0	
B	Sum of Approach Vol			1459			138			75			0		
C	Dist of Approach Vol		0%	57%	43%	1%	99%	0%	75%	0%	25%	0%	0%	0%	
D	Approach Growth Factor			-29%			153%			41%			0%		
E	New Appch Vol Sum = B x D			1036			350			106			0		
F	Vol Based on Entry Dist. = C x E		0	593	443.0462	3	2099	0	79	0	27	0	0	0	
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols			
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR	
G	Existing Exit Vol		0	835	19	56	137	0	0	0	0	1	0	624	
H	Sum of Exit Vol			854			193			0			625		
J	Dist of Exit Vol		0%	98%	2%	29%	71%	0%	0%	0%	0%	0%	0%	100%	
K	Exit Growth Factor			19%			-19%			0%			8%		
L	New Exit Vol Sum = H x K			1019			156			0			678		
M	Vol Based on Exit Dist = J x L		0	996	23	45	111	0	0	0	0	1	0	677	
N	Transpose Exit Vols (EBL…SBR)		0	996	677	1	111	0	45	0	23	0	0	0	
O	Average Entry & Exit Vols = (F+N)/2		0	795	560	2	1105	0	62	0	25	0	0	0	
P	Revised Sum of Approach Vol			1355			1107			87			0		
R	Revised Dist of Approach Vol		0%	59%	41%	0%	100%	0%	72%	0%	28%	0%	0%	0%	
	Rounded Volumes		**0**	**800**	**550**	**0**	**225**	**0**	**60**	**0**	**30**	**0**	**0**	**0**	
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols			
22	Theote Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
A	Existing Volume		2	35	8	21	17	17	4	42	6	78	445	16	
B	Sum of Approach Vol			45			55			52			539		
C	Dist of Approach Vol		4%	78%	18%	38%	31%	31%	8%	81%	12%	14%	83%	3%	
D	Approach Growth Factor			0%			0%			41%			8%		
E	New Appch Vol Sum = B x D			45			55			74			585		
F	Vol Based on Entry Dist. = C x E		2	35	8	21	17	17	6	59	8	85	483	17	
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols			
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR	
G	Existing Exit Vol		78	35	6	4	17	16	2	42	17	21	445	8	
H	Sum of Exit Vol			119			37			61			474		
J	Dist of Exit Vol		66%	29%	5%	11%	46%	43%	3%	69%	28%	4%	94%	2%	
K	Exit Growth Factor			0%			0%			41%			8%		
L	New Exit Vol Sum = H x K			119			37			86			514		
M	Vol Based on Exit Dist = J x L		78	35	6	4	17	16	3	59	24	23	483	9	
N	Transpose Exit Vols (EBL…SBR)		3	35	9	23	17	24	4	59	6	78	483	16	
O	Average Entry & Exit Vols = (F+N)/2		2	35	8	22	17	21	5	59	7	81	483	17	
P	Revised Sum of Approach Vol			46			59			71			581		
R	Revised Dist of Approach Vol		5%	76%	18%	37%	29%	35%	7%	83%	10%	14%	83%	3%	
	Rounded Volumes		**0**	**40**	**10**	**20**	**20**	**20**	**10**	**60**	**10**	**80**	**475**	**20**	

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
	Growth Factors Based on Peak Period Link Volumes													
		1/30/2014	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
23	Flagler Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		25	198	5	2	173	18	16	0	14	6	0	12
B	Sum of Approach Vol			228			193			30			18	
C	Dist of Approach Vol		11%	87%	2%	1%	90%	9%	53%	0%	47%	33%	0%	67%
D	Approach Growth Factor			-52%			-25%			0%			-9%	
E	New Approach Vol Sum = B x D			110			145			30			16	
F	Vol Based on Entry Dist. = C x E		12	95	2.409326	1	130	13	16	0	14	5	0	11
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		6	198	14	16	173	12	25	0	18	2	0	5
H	Sum of Exit Vol			218			201			43			7	
J	Dist of Exit Vol		3%	91%	6%	8%	86%	6%	58%	0%	42%	29%	0%	71%
K	Exit Growth Factor			-54%			-24%			-11%			0%	
L	New Exit Vol Sum = H x K			100			152			38			7	
M	Vol Based on Exit Dist = J x L		3	90	6	12	131	9	22	0	16	2	0	5
N	Transpose Exit Vols (EBL…SBR)		22	90	5	2	131	16	12	0	6	3	0	9
O	Average Entry & Exit Vols = (F+N)/2		17	93	4	2	130	15	14	0	10	4	0	10
P	Revised Sum of Approach Vol			114			147			24			14	
R	Revised Dist of Approach Vol		15%	82%	3%	1%	89%	10%	58%	0%	42%	29%	0%	71%
	Rounded Volumes		**20**	**90**	**10**	**0**	**125**	**20**	**20**	**0**	**10**	**10**	**0**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
24	Mt Vernon Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		53	0	19	0	0	0	1	141	0	0	358	61
B	Sum of Approach Vol			72			0			142			419	
C	Dist of Approach Vol		74%	0%	26%	0%	0%	0%	1%	99%	0%	0%	85%	15%
D	Approach Growth Factor			39%			0%			-51%			-19%	
E	New Approach Vol Sum = B x D			100			0			69			339	
F	Vol Based on Entry Dist. = C x E		74	0	26.4521	0	0	0	0	69	0	0	289	49
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	1	0	61	53	141	0	0	358	19
H	Sum of Exit Vol			0			62			194			377	
J	Dist of Exit Vol		0%	0%	0%	2%	0%	98%	27%	73%	0%	0%	95%	5%
K	Exit Growth Factor			0%			34%			-9%			-38%	
L	New Exit Vol Sum = H x K			0			83			177			233	
M	Vol Based on Exit Dist = J x L		0	0	0	1	0	82	48	129	0	0	221	12
N	Transpose Exit Vols (EBL…SBR)		48	0	12	0	0	0	1	129	0	0	221	82
O	Average Entry & Exit Vols = (F+N)/2		61	0	19	0	0	0	1	99	0	0	255	66
P	Revised Sum of Approach Vol			80			0			100			321	
R	Revised Dist of Approach Vol		76%	0%	24%	0%	0%	0%	1%	99%	0%	0%	80%	20%
	Rounded Volumes		**60**	**0**	**20**	**0**	**0**	**0**	**0**	**100**	**0**	**0**	**250**	**70**

FORT BELVOIR TMP TRAFFIC ANALYSIS						Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1								
	Growth Factors Based on Peak Period Link Volumes													
		1/30/2014	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
25	Mt Vernon Rd	Gillespie Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		14	11	0	3	23	36	9	178	61	0	70	3
B	Sum of Approach Vol			25			62			248			73	
C	Dist of Approach Vol		56%	44%	0%	5%	37%	58%	4%	72%	25%	0%	96%	4%
D	Approach Growth Factor			29%			0%			-54%			-38%	
E	New Approach Vol Sum = B x D			32			62			113			45	
F	Vol Based on Entry Dist. = C x E		18	14	0	3	23	36	4	81	28	0	43	2
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	11	61	9	23	3	14	178	36	3	70	0
H	Sum of Exit Vol			72			35			228			73	
J	Dist of Exit Vol		0%	15%	85%	26%	66%	9%	6%	78%	16%	4%	96%	0%
K	Exit Growth Factor			0%			0%			-51%			-25%	
L	New Exit Vol Sum = H x K			72			35			111			55	
M	Vol Based on Exit Dist = J x L		0	11	61	9	23	3	7	87	18	2	52	0
N	Transpose Exit Vols (EBL…SBR)		7	11	0	2	23	18	9	87	61	0	52	3
O	Average Entry & Exit Vols = (F+N)/2		12	13	0	3	23	27	7	84	44	0	48	2
P	Revised Sum of Approach Vol			25			52			135			50	
R	Revised Dist of Approach Vol		50%	50%	0%	5%	44%	51%	5%	62%	33%	0%	95%	5%
	Rounded Volumes		**10**	**10**	**0**	**0**	**20**	**30**	**10**	**90**	**50**	**0**	**50**	**0**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
26	Gunston Rd	3rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		1	0	1	6	0	2	2	415	36	37	663	3
B	Sum of Approach Vol			2			8			453			703	
C	Dist of Approach Vol		0%	0%	0%	75%	0%	25%	0%	92%	8%	5%	94%	0%
D	Approach Growth Factor			0%			0%			12%			148%	
E	New Approach Vol Sum = B x D			2			8			508			1745	
F	Vol Based on Entry Dist. = C x E		0	0	0	6	0	2	2	466	40	92	1645	7
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		37	0	36	2	0	3	1	415	2	6	663	1
H	Sum of Exit Vol			73			5			418			670	
J	Dist of Exit Vol		51%	0%	49%	40%	0%	60%	0%	99%	0%	1%	99%	0%
K	Exit Growth Factor			0%			0%			28%			**154%**	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			73			5			536		**1705**	**1629**	**1667**
M	Vol Based on Exit Dist = J x L		37	0	36	2	0	3	1	532	3	**15**	**1650**	**2**
N	Transpose Exit Vols (EBL…SBR)		1	0	2	15	0	3	2	532	36	37	1650	3
O	Average Entry & Exit Vols = (F+N)/2		1	0	1	10	0	2	2	499	38	64	1648	5
P	Revised Sum of Approach Vol			2			13			539			1717	
R	Revised Dist of Approach Vol		34%	0%	66%	82%	0%	18%	0%	93%	7%	4%	96%	0%
	Rounded Volumes		**0**	**0**	**0**	**10**	**0**	**0**	**0**	**500**	**40**	**70**	**1675**	**10**
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - AM Alternative 1									
	Growth Factors Based on Peak Period Link Volumes													
		1/30/2014	Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)		>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
27	Gunston Rd	Jackson Loop S.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		36	0	16	0	0	0	52	491	0	0	516	52
B	Sum of Approach Vol			52			0			543			568	
C	Dist of Approach Vol		69%	0%	31%	0%	0%	0%	10%	90%	0%	0%	91%	9%
D	Approach Growth Factor			0%			0%			-1%			153%	
E	New Approach Vol Sum = B x D			52			0			535			1437	
F	Vol Based on Entry Dist. = C x E		36	0	16	0	0	0	51	484	0	0	1306	132
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
			SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	52	0	52	36	491	0	0	516	16
H	Sum of Exit Vol			0			104			527			532	
J	Dist of Exit Vol		0%	0%	0%	50%	0%	50%	7%	93%	0%	0%	97%	3%
K	Exit Growth Factor			0%			0%			12%			162%	
L	New Exit Vol Sum = H x K/H+abs/Avg (2)			0			104			591			1393	
M	Vol Based on Exit Dist = J x L		0	0	0	52	0	52	40	551	0	0	1351	42
N	Transpose Exit Vols (EBL…SBR)		40	0	42	0	0	0	52	551	0	0	1351	52
O	Average Entry & Exit Vols = (F+N)/2		38	0	29	0	0	0	52	517	0	0	1328	92
P	Revised Sum of Approach Vol			67			0			569			1420	
R	Revised Dist of Approach Vol		57%	0%	43%	0%	0%	0%	9%	91%	0%	0%	94%	6%
	Rounded Volumes		**40**	**0**	**30**	**0**	**0**	**0**	**50**	**525**	**0**	**0**	**1325**	**90**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM No-Build								
	Growth Factors Based on Peak Period Link Volumes			2/5/2014									
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Steet	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
1	DLA West Gate	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	227	70	85	974	0	555	0	49	0	0	0
B	Sum of Approach Vol			297			1059			604			0	
C	Dist of Approach Vol		0%	76%	24%	8%	92%	0%	92%	0%	8%	0%	0%	0%
D	Approach Growth Factor			-4.6%			10%			2%			0%	
E	New Approach Vol Sum = B x D			283			1166			616			0	
F	Vol Based on Entry Dist. = C x E		0	216	67	94	1072	0	566	0	50	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	227	49	555	974	0	0	0	0	85	0	70
H	Sum of Exit Vol			276			1529			0			155	
J	Dist of Exit Vol		0%	82%	18%	36%	64%	0%	0%	0%	0%	55%	0%	45%
K	Exit Growth Factor			11%			0%			0%			6%	
L	New Exit Vol Sum = H x K			307			1536			0			164	
M	Vol Based on Exit Dist = J x L		0	253	55	557	978	0	0	0	0	90	0	74
N	Transpose Exit Vols (EBL…SBR)		0	253	74	90	978	0	557	0	55	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	235	70	92	1025	0	562	0	52	0	0	0
P	Revised Sum of Approach Vol			305			1117			614			0	
R	Revised Dist of Approach Vol		0%	77%	23%	8%	92%	0%	91%	0%	9%	0%	0%	0%
	Rounded Volumes		**0**	**225**	**70**	**90**	**1025**	**0**	**575**	**0**	**50**	**0**	**0**	**0**
Site	NS Steet	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
2	DLA East Gate	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	246	28	13	752	0	342	0	242	0	0	0
B	Sum of Approach Vol			274			765			584			0	
C	Dist of Approach Vol		0%	90%	10%	2%	98%	0%	59%	0%	41%	0%	0%	0%
D	Approach Growth Factor			11%			31%			2%			0%	
E	New Appch Vol Sum = B x D			305			999			595			0	
F	Vol Based on Entry Dist. = C x E		0	274	31	17	982	0	349	0	247	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	246	242	342	752	0	0	0	0	13	0	28
H	Sum of Exit Vol			488			1094			0			41	
J	Dist of Exit Vol		0%	50%	50%	31%	69%	0%	0%	0%	0%	32%	0%	68%
K	Exit Growth Factor			60%			19%			0%			23%	
L	New Exit Vol Sum = H x K			783			1305			0			50	
M	Vol Based on Exit Dist = J x L		0	395	388	408	897	0	0	0	0	16	0	34
N	Transpose Exit Vols (EBL…SBR)		0	395	34	16	897	0	408	0	388	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	308	30	15	905	0	363	0	292	0	0	0
P	Revised Sum of Approach Vol			338			920			654			0	
R	Revised Dist of Approach Vol		0%	91%	9%	2%	98%	0%	55%	0%	45%	0%	0%	0%
	Rounded Volumes		**0**	**300**	**30**	**20**	**900**	**0**	**375**	**0**	**300**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM No-Build									
	Growth Factors Based on Peak Period Link Volumes			2/5/2014										
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
3	Beulah St	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		195	306	10	10	581	555	134	71	47	234	11	32
B	Sum of Approach Vol			511			1146			252			277	
C	Dist of Approach Vol		38%	60%	2%	1%	51%	48%	53%	28%	19%	84%	4%	12%
D	Approach Growth Factor			39%			11%			0%			-28%	
E	New Approach Vol Sum = B x D			710			1266			251			200	
F	Vol Based on Entry Dist. = C x E		271	425	14	11	642	613	134	71	47	169	8	23
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		234	306	47	134	581	32	195	71	555	10	11	10
H	Sum of Exit Vol			587			747			821			31	
J	Dist of Exit Vol		40%	52%	8%	18%	78%	4%	24%	9%	68%	32%	35%	32%
K	Exit Growth Factor			1%			31%			-22%			1%	
L	New Exit Vol Sum = H x K			594			975			644			31	
M	Vol Based on Exit Dist = J x L		237	310	48	175	759	42	153	56	436	10	11	10
N	Transpose Exit Vols (EBL…SBR)		153	310	10	10	759	436	175	56	48	237	11	42
O	Average Entry & Exit Vols = (F+N)/2		212	367	12	11	700	524	154	63	47	203	10	32
P	Revised Sum of Approach Vol			592			1235			265			245	
R	Revised Sist of Approach Vol		36%	62%	2%	1%	57%	42%	58%	24%	18%	83%	4%	13%
	Rounded Volumes		**225**	**375**	**10**	**10**	**700**	**525**	**150**	**60**	**50**	**200**	**10**	**30**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
4	Gunston Rd	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	15	523	6	26	0	1318	0	8	0	0	0
B	Sum of Approach Vol			**538**			**32**			**1326**			**0**	
C	Dist of Approach Vol		**0%**	**3%**	**97%**	**19%**	**81%**	**0%**	**99%**	**0%**	**1%**	**0%**	**0%**	**0%**
D	*Approach Growth Factor based on rebalanced screenline east of Gunston*			1%			11%			81%			0%	
E	New Appch Vol Sum = B x D			544			35			2397		0		
F	Vol Based on Entry Dist. = C x E		0	15	529	7	29	0	2383	0	14	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	15	8	1318	26	0	0	0	0	6	0	523
H	Sum of Exit Vol			23			1344			0			529	
J	Dist of Exit Vol		0%	65%	35%	98%	2%	0%	0%	0%	0%	1%	0%	99%
K	*Exit Growth Factor based on rebalanced screenline east of Gunston*			-25%			11%			0%			151%	
L	New Exit Vol Sum = H x K			17			1485			0			1327	
M	Vol Based on Exit Dist = J x L		0	11	6	1456	29	0	0	0	0	15	0	1312
N	Transpose Exit Vols (EBL…SBR)		0	11	1312	15	29	0	1456	0	6	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	13	920	11	29	0	1919	0	10	0	0	0
P	Revised Sum of Approach Vol			934			40			1930			0	
R	Revised Dist of Approach Vol		0%	1%	99%	27%	73%	0%	99%	0%	1%	0%	0%	0%
	Rounded Volumes		**0**	**10**	**925**	**10**	**30**	**0**	**1925**	**0**	**10**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	**NS Street**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**	
5	**Woodlawn**	**Gorgas**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		11	232	47	1	82	14	29	2	1	17	1	10
B	**Sum of Approach Vol**			290			97			32			28	
C	**Dist of Approach Vol**		4%	80%	16%	1%	85%	14%	91%	6%	3%	61%	4%	36%
D	***Approach Growth Factor based on rebalanced screenline east of Gunston***			239%			0%			-21%			-25%	
E	**New Approach Vol Sum = B x D**		982	411	697		97			25			21	
F	**Vol Based on Entry Dist. = C x E**		37	785	159	1	82	14	23	2	1	13	1	7
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		17	232	1	29	82	10	11	2	14	1	1	47
H	**Sum of Exit Vol**			250			121			27			49	
J	**Dist of Exit Vol**		7%	93%	0%	24%	68%	8%	41%	7%	52%	2%	2%	96%
K	***Exit Growth Factor based on rebalanced screenline east of Gunston***			-47%			-20%			11%			106%	
L	**New Exit Vol Sum = H x K**			131			97			30			101	
M	**Vol Based on Exit Dist = J x L**		**9**	**122**	**1**	**23**	**66**	**8**	**12**	**2**	**16**	**2**	**2**	**97**
N	**Transpose Exit Vols (EBL…SBR)**		**12**	**122**	**97**	**2**	**66**	**16**	**23**	**2**	**1**	**9**	**2**	**8**
O	**Average Entry & Exit Vols = (F+N)/2**		**25**	**454**	**128**	**2**	**74**	**15**	**23**	**2**	**1**	**11**	**1**	**8**
P	**Revised Sum of Approach Vol**			**606**			**90**			**26**			**20**	
R	**Revised Dist of Approach Vol**		**4%**	**75%**	**21%**	**2%**	**82%**	**16%**	**90%**	**7%**	**3%**	**54%**	**7%**	**39%**
	Rounded Volumes		**30**	**450**	**125**	**0**	**80**	**20**	**20**	**0**	**0**	**10**	**0**	**10**

Site	**NS Street**	**EW Street**	**Eastbnd Apprch Vols**			**Westbnd Apprch Vols**			**Northbnd Apprch Vols**			**Southbnd Apprch Vols**		
6	**Gunston Rd**	**Abbott Rd**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	**Existing Volume**		15	2	5	76	0	48	1	1116	107	44	341	3
B	**Sum of Approach Vol**			22			124			1224			388	
C	**Dist of Approach Vol**		68%	9%	23%	61%	0%	39%	0%	91%	9%	11%	88%	1%
D	***Approach Growth Factor based on rebalanced screenline east of Gunston***			0%			11%			124%			178%	
E	**New Appch Vol Sum = B x D//B+abs//Avg (1)**			22			137		2741	2224	2483	1080		
F	**Vol Based on Entry Dist. = C x E**		15	2	5	84	0	53	2	2264	217	122	949	8
			Eastbound Exit Vols			**Westbound Exit Vols**			**Northbound Exit Vols**			**Southbound Exit Vols**		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	**Existing Exit Vol**		44	2	107	1	0	3	15	1116	48	76	341	5
H	**Sum of Exit Vol**			153			4			1179			422	
J	**Dist of Exit Vol**		29%	1%	70%	25%	0%	75%	1%	95%	4%	18%	81%	1%
K	***Exit Growth Factor based on rebalanced screenline east of Gunston***			-25%			0%			99%			410%	
L	**New Exit Vol Sum = H x K//H+abs//Avg (2)**			115			4			2346		2152	1220	1686
M	**Vol Based on Exit Dist = J x L**		33	1	80	1	0	3	30	2221	96	304	1362	20
N	**Transpose Exit Vols (EBL…SBR)**		30	1	20	304	0	96	1	2221	80	33	1362	3
O	**Average Entry & Exit Vols = (F+N)/2**		**22**	**2**	**12**	**194**	**0**	**74**	**2**	**2242**	**149**	**78**	**1156**	**6**
P	**Revised Sum of Approach Vol**			37			268			2392			1239	
R	**Revised Dist of Approach Vol**		61%	5%	34%	72%	0%	28%	0%	94%	6%	6%	93%	0%
	Rounded Volumes		**20**	**0**	**10**	**200**	**0**	**80**	**0**	**2250**	**150**	**80**	**1150**	**10**

1	**Entry volumes for northbound approach based on average of volumes from growth factor and absolute volume increase.**
2	**Exit volumes for southbound exits based on average of volumes from growth factor and absolute volume increase.**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM No-Build								
	Growth Factors Based on Peak Period Link Volumes			2/5/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
7	Gunston Rd	Goethals Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		14	1	8	46	1	52	3	1166	66	11	410	2
B	Sum of Approach Vol			23			99			1235			423	
C	Dist of Approach Vol		61%	4%	35%	46%	1%	53%	0%	94%	5%	3%	97%	0%
D	*Approach Growth Factor based on rebalanced screenline east of Gunston*			0%			11%			89%			410%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			23		110	126	118		2335		2157	1221	1689
F	Vol Based on Entry Dist. = C x E		14	1	8	55	1	62	6	2205	125	44	1637	8
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		11	1	66	3	1	2	14	1166	52	46	410	8
H	Sum of Exit Vol			78			6			1232			464	
J	Dist of Exit Vol		14%	1%	85%	50%	17%	33%	1%	95%	4%	10%	88%	2%
K	*Exit Growth Factor based on rebalanced screenline east of Gunston*			-25%			0%			124%			329%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			58			6		**2758**	**2232**	**2495**	**1991**	**1240**	**1616**
M	Vol Based on Exit Dist = J x L		8	1	49	3	1	2	**28**	**2361**	**105**	**160**	**1428**	**28**
N	Transpose Exit Vols (EBL…SBR)		28	1	28	160	1	105	3	2361	49	8	1428	2
O	Average Entry & Exit Vols = (F+N)/2		**21**	**1**	**18**	**107**	**1**	**84**	**4**	**2283**	**87**	**26**	**1532**	**5**
P	Revised Sum of Approach Vol			40			192			2374			1563	
R	Revised Dist of Approach Vol		53%	2%	45%	56%	1%	44%	0%	96%	4%	2%	98%	0%
	Rounded Volumes		**20**	**0**	**20**	**100**	**0**	**90**	**10**	**2275**	**90**	**30**	**1525**	**10**
1	Entry volumes for westbound and southbound approaches based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for northbound and southbound exits based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
8	Gunston Rd	1st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	9	0	387	0	889	15	148	336	0
B	Sum of Approach Vol			0			396			904			484	
C	Dist of Approach Vol		0%	0%	0%	2%	0%	98%	0%	98%	2%	31%	69%	0%
D	Approach Growth Factor			0%			0%			75%			146%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			0			396			1582		**1190**	**929**	**1059**
F	Vol Based on Entry Dist. = C x E		0	0	0	9	0	387	0	1555	26	**324**	**735**	**0**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		148	0	15	0	0	0	0	889	387	9	336	0
H	Sum of Exit Vol			163			0			1276			345	
J	Dist of Exit Vol		91%	0%	9%	0%	0%	0%	0%	70%	30%	3%	97%	0%
K	Exit Growth Factor			0%			0%			75%			146%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			163			0			2232		**848**	**790**	**819**
M	Vol Based on Exit Dist = J x L		148	0	15	0	0	0	0	1555	677	**163**	**790**	**0**
N	Transpose Exit Vols (EBL…SBR)		0	0	0	163	0	677	0	1555	15	148	790	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**0**	**0**	**86**	**0**	**532**	**0**	**1555**	**21**	**236**	**762**	**0**
P	Revised Sum of Approach Vol			0			618			1576			998	
R	Revised Dist of Approach Vol		0%	0%	0%	14%	0%	86%	0%	99%	1%	24%	76%	0%
	Rounded Volumes		0	0	0	90	0	525	0	1550	20	250	775	0
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
9	Gunston Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	18	0	124	0	480	28	125	469	0
B	Sum of Approach Vol			0			142			508			594	
C	Dist of Approach Vol		0%	0%	0%	13%	0%	87%	0%	94%	6%	21%	79%	0%
D	Approach Growth Factor			0%			-100%			129%			96%	
E	New Appch Vol Sum = B x D			0			0			1163			1162	
F	Vol Based on Entry Dist. = C x E		0	0	0	0	0	0	0	1099	64	244	917	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		125	0	28	0	0	0	0	480	124	18	469	0
H	Sum of Exit Vol			153			0			604			487	
J	Dist of Exit Vol		82%	0%	18%	0%	0%	0%	0%	79%	21%	4%	96%	0%
K	Exit Growth Factor			-99%			0%			67%			155%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			1			0			1009		**1241**	**875**	**1058**
M	Vol Based on Exit Dist = J x L		1	0	0	0	0	0	0	802	207	**39**	**1019**	**0**
N	Transpose Exit Vols (EBL…SBR)		0	0	0	39	0	207	0	802	0	1	1019	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	20	0	104	0	950	32	123	968	0
P	Revised Sum of Approach Vol			0			123			982			1091	
R	Revised Dist of Approach Vol		0%	0%	0%	16%	0%	84%	0%	97%	3%	11%	89%	0%
	Rounded Volumes		**0**	**0**	**0**	**20**	**0**	**100**	**0**	**950**	**30**	**125**	**975**	**0**
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
10	Gunston Rd	Pohick Rd/12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		123	136	46	67	184	179	177	218	57	111	123	213
B	Sum of Approach Vol			305			430			452			447	
C	Dist of Approach Vol		40%	45%	15%	16%	43%	42%	39%	48%	13%	25%	28%	48%
D	Approach Growth Factor			-2%			13%			3%			155%	
E	New Approach Vol Sum = B x D			299			487			465		1139	835	987
F	Vol Based on Entry Dist. = C x E		121	133	45.0677	76	208	203	182	224	59	245	272	470
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		111	136	57	177	184	213	123	218	179	67	123	46
H	Sum of Exit Vol			304			574			520			236	
J	Dist of Exit Vol		37%	45%	19%	31%	32%	37%	24%	42%	34%	28%	52%	19%
K	Exit Growth Factor			-2%			-13%			129%			34%	
L	New Exit Vol Sum = H x K			298			501			1190			317	
M	Vol Based on Exit Dist = J x L		109	133	56	154	161	186	282	499	410	90	165	62
N	Transpose Exit Vols (EBL…SBR)		282	133	62	90	161	410	154	499	56	109	165	186
O	Average Entry & Exit Vols = (F+N)/2		201	133	53	83	184	306	168	362	57	177	218	328
P	Revised Sum of Approach Vol			388			574			587			724	
R	Revised Dist of Approach Vol		52%	34%	14%	14%	32%	53%	29%	62%	10%	24%	30%	45%
	Rounded Volumes		200	125	50	80	175	300	175	375	60	175	225	325

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
11	Gunston Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		35	48	6	4	34	103	20	265	8	30	76	31
B	Sum of Approach Vol			89			141			293			137	
C	Dist of Approach Vol		39%	54%	7%	3%	24%	73%	7%	90%	3%	22%	55%	23%
D	Approach Growth Factor			0%			0%			3%			34%	
E	New Approach Vol Sum = B x D			89			141			301			184	
F	Vol Based on Entry Dist. = C x E		35	48	6	4	34	103	21	273	8	40	102	42
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		30	48	8	20	34	31	35	265	103	4	76	6
H	Sum of Exit Vol			86			85			403			86	
J	Dist of Exit Vol		35%	56%	9%	24%	40%	36%	9%	66%	26%	5%	88%	7%
K	Exit Growth Factor			0%			0%			3%			34%	
L	New Exit Vol Sum = H x K			86			85			414			116	
M	Vol Based on Exit Dist = J x L		30	48	8	20	34	31	36	273	106	5	102	8
N	Transpose Exit Vols (EBL…SBR)		36	48	8	5	34	106	20	273	8	30	102	31
O	Average Entry & Exit Vols = (F+N)/2		**35**	**48**	**7**	**5**	**34**	**104**	**20**	**273**	**8**	**35**	**102**	**36**
P	Revised Sum of Approach Vol			91			143			301			174	
R	Revised Dist of Approach Vol		39%	53%	8%	3%	24%	73%	7%	91%	3%	20%	59%	21%
	Rounded Volumes		**40**	**50**	**10**	**10**	**40**	**100**	**20**	**275**	**10**	**40**	**100**	**40**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
12	Gunston Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		2	11	22	3	38	8	276	136	7	11	44	4
B	Sum of Approach Vol			35			49			419			59	
C	Dist of Approach Vol		6%	31%	63%	6%	78%	16%	66%	32%	2%	19%	75%	7%
D	Approach Growth Factor			0%			-47%			0%			34%	
E	New Approach Vol Sum = B x D			35			26			417			79	
F	Vol Based on Entry Dist. = C x E		2	11	22	2	20	4	275	135	7	15	59	5
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		11	11	7	276	38	4	2	136	8	3	44	22
H	Sum of Exit Vol			29			318			146			69	
J	Dist of Exit Vol		38%	38%	24%	87%	12%	1%	1%	93%	5%	4%	64%	32%
K	Exit Growth Factor			-5%			0%			3%			1%	
L	New Exit Vol Sum = H x K			27			318			150			69	
M	Vol Based on Exit Dist = J x L		10	10	7	276	38	4	2	140	8	3	44	22
N	Transpose Exit Vols (EBL…SBR)		2	10	22	3	38	8	276	140	7	10	44	4
O	Average Entry & Exit Vols = (F+N)/2		2	11	22	2	29	6	275	138	7	13	52	5
P	Revised Sum of Approach Vol			35			38			420			69	
R	Revised Dist of Approach Vol		6%	31%	63%	6%	77%	17%	66%	33%	2%	18%	75%	7%
	Rounded Volumes		**0**	**10**	**20**	**0**	**30**	**10**	**275**	**150**	**10**	**10**	**50**	**10**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
13	Gunston Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	6	0	50	0	387	108	27	15	0
B	Sum of Approach Vol			0			56			495			42	
C	Dist of Approach Vol		0%	0%	0%	11%	0%	89%	0%	78%	22%	64%	36%	0%
D	Approach Growth Factor			0%			0%			0%			1%	
E	New Approach Vol Sum = B x D			0			56			493			42	
F	Vol Based on Entry Dist. = C x E		0	0	0	6	0	50	0	385	107	27	15	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		27	0	108	0	0	0	0	387	50	6	15	0
H	Sum of Exit Vol			135			0			437			21	
J	Dist of Exit Vol		20%	0%	80%	0%	0%	0%	0%	89%	11%	29%	71%	0%
K	Exit Growth Factor			0%			0%			0%			1%	
L	New Exit Vol Sum = H x K			135			0			435			21	
M	Vol Based on Exit Dist = J x L		27	0	108	0	0	0	0	385	50	6	15	0
N	Transpose Exit Vols (EBL…SBR)		0	0	0	6	0	50	0	385	108	27	15	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**0**	**0**	**6**	**0**	**50**	**0**	**385**	**108**	**27**	**15**	**0**
P	Revised Sum of Approach Vol			0			56			493			42	
R	Revised Dist of Approach Vol		0%	0%	0%	11%	0%	89%	0%	78%	22%	64%	36%	0%
	Rounded Volumes		**0**	**0**	**0**	**10**	**0**	**50**	**0**	**375**	**100**	**30**	**20**	**0**
Site			Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
14	Belvoir Hospital Traffic Circle		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		347	9	149	8	1	6	51	535	30	5	110	75
B	Sum of Approach Vol			505			15			616			190	
C	Dist of Approach Vol		69%	2%	30%	53%	7%	40%	8%	87%	5%	3%	58%	39%
D	Approach Growth Factor			0%			0%			-22%			-22%	
E	New Approach Vol Sum = B x D			505			15			483			149	
F	Vol Based on Entry Dist. = C x E		347	9	149	8	1	6	40	419	24	4	86	59
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		5	9	30	51	1	75	347	535	6	8	110	149
H	Sum of Exit Vol			44			127			888			267	
J	Dist of Exit Vol		11%	20%	68%	40%	1%	59%	39%	60%	1%	3%	41%	56%
K	Exit Growth Factor			0%			0%			-22%			-22%	
L	New Exit Vol Sum = H x K			44			127			696			209	
M	Vol Based on Exit Dist = J x L		5	9	30	51	1	75	272	419	5	6	86	117
N	Transpose Exit Vols (EBL…SBR)		272	9	117	6	1	5	51	419	30	5	86	75
O	Average Entry & Exit Vols = (F+N)/2		**309**	**9**	**133**	**7**	**1**	**5**	**45**	**419**	**27**	**4**	**86**	**67**
P	Revised Sum of Approach Vol			451			13			492			157	
R	Revised Dist of Approach Vol		69%	2%	29%	53%	7%	40%	9%	85%	5%	3%	55%	42%
	Rounded Volumes		**300**	**10**	**125**	**10**	**0**	**10**	**50**	**425**	**30**	**10**	**90**	**70**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
15	Belvoir Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		66	41	81	0	0	0	69	493	182	3	177	7
B	Sum of Approach Vol			188			0			744			187	
C	Dist of Approach Vol		35%	22%	43%	0%	0%	0%	9%	66%	24%	2%	95%	4%
D	Approach Growth Factor			0%			-27%			-21%			-22%	
E	New Approach Vol Sum = B x D			188			0			587			146	
F	Vol Based on Entry Dist. = C x E		66	41	81	0	0	0	54	389	144	2	139	5
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		3	41	182	69	0	7	66	493	0	0	177	81
H	Sum of Exit Vol			226			76			559			258	
J	Dist of Exit Vol		1%	18%	81%	91%	0%	9%	12%	88%	0%	0%	69%	31%
K	Exit Growth Factor			-20%			0%			-22%			-24%	
L	New Exit Vol Sum = H x K			180			76			438			196	
M	Vol Based on Exit Dist = J x L		2	33	145	69	0	7	52	386	0	0	134	61
N	Transpose Exit Vols (EBL…SBR)		52	33	61	0	0	0	69	386	145	2	134	7
O	Average Entry & Exit Vols = (F+N)/2		**59**	**37**	**71**	**0**	**0**	**0**	**62**	**388**	**144**	**2**	**136**	**6**
P	Revised Sum of Approach Vol			167			0			594			145	
R	Revised Dist of Approach Vol		35%	22%	43%	0%	0%	0%	10%	65%	24%	2%	94%	4%
	Rounded Volumes		**60**	**40**	**70**	**0**	**0**	**0**	**60**	**400**	**150**	**0**	**150**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
16	Belvoir Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		171	16	23	3	7	7	57	450	9	12	180	131
B	Sum of Approach Vol	ESum		210			17			516			323	
C	Dist of Approach Vol	E% Dist	81%	8%	11%	18%	41%	41%	11%	87%	2%	4%	56%	41%
D	Approach Growth Factor	GF		-99%			-55%			-24%			-24%	
E	New Approach Vol Sum = B	OSum x GF		1			8			392			245	
F	Vol Based on Entry Dist. = C x E		1	0	0	1	3	3	43	342	7	9	136	99
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		12	16	9	57	7	131	171	450	7	3	180	23
H	Sum of Exit Vol			37			195			628			206	
J	Dist of Exit Vol		32%	43%	24%	29%	4%	67%	27%	72%	1%	1%	87%	11%
K	Exit Growth Factor			-100%			-100%			-21%			-5%	
L	New Exit Vol Sum = H x K			0			0			496			195	
M	Vol Based on Exit Dist = J x L		0	0	0	0	0	0	135	355	6	3	170	22
N	Transpose Exit Vols (EBL…SBR)		135	0	22	3	0	6	0	355	0	0	170	0
O	Average Entry & Exit Vols = (F+N)/2		**68**	**0**	**11**	**2**	**2**	**4**	**22**	**349**	**3**	**5**	**153**	**50**
P	Revised Sum of Approach Vol			79			8			374			208	
R	Revised Dist of Approach Vol		86%	0%	14%	26%	20%	54%	6%	93%	1%	2%	74%	24%
	Rounded Volumes		**70**	**0**	**10**	**0**	**0**	**10**	**20**	**350**	**0**	**10**	**150**	**50**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
17	Belvoir Rd	12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		163	0	182	0	0	0	235	266	0	0	70	121
B	Sum of Approach Vol			345			0			501			191	
C	Dist of Approach Vol		47%	0%	53%	0%	0%	0%	47%	53%	0%	0%	37%	63%
D	Approach Growth Factor			-70%			0%			-67%			-16%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			102			0		167	509	338		160	
F	Vol Based on Entry Dist. = C x E		48	0	54	0	0	0	239	270	0	0	59	101
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	235	0	121	163	266	0	0	70	182
H	Sum of Exit Vol			0			356			429			252	
J	Dist of Exit Vol		0%	0%	0%	66%	0%	34%	38%	62%	0%	0%	28%	72%
K	Exit Growth Factor			0%			-39%			-72%			0%	
L	New Exit Vol Sum = H x K			0			216			120			252	
M	Vol Based on Exit Dist = J x L		0	0	0	142	0	73	45	74	0	0	70	182
N	Transpose Exit Vols (EBL…SBR)		45	0	182	0	0	0	142	74	0	0	70	73
O	Average Entry & Exit Vols = (F+N)/2		**47**	**0**	**118**	**0**	**0**	**0**	**190**	**172**	**0**	**0**	**64**	**87**
P	Revised Sum of Approach Vol			165			0			363			152	
R	Revised Dist of Approach Vol		28%	0%	72%	0%	0%	0%	53%	47%	0%	0%	42%	58%
	Rounded Volumes		**50**	**0**	**125**	**0**	**0**	**0**	**200**	**175**	**0**	**0**	**70**	**90**
1	Northbound GF shows significant decrease and was not used. Manual estimated of future volume utilized.													

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
18	Belvoir Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		46	1	44	0	0	1	54	396	6	1	153	21
B	Sum of Approach Vol			91			1			456			175	
C	Dist of Approach Vol		51%	1%	48%	0%	0%	0%	12%	87%	1%	1%	87%	12%
D	Approach Growth Factor			0%			0%			324%			0%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			91			1		**1935**	**553**	**1244**		175	
F	Vol Based on Entry Dist. = C x E		46	1	44	0	0	0	**147**	**1080**	**16**	1	153	21
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		1	1	6	54	0	21	46	396	1	0	153	44
H	Sum of Exit Vol			8			75			443			197	
J	Dist of Exit Vol		13%	13%	75%	72%	0%	28%	10%	89%	0%	0%	78%	22%
K	Exit Growth Factor			0%			0%			324%			0%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			8			75		1880	540	1210		197	
M	Vol Based on Exit Dist = J x L		1	1	6	54	0	21	126	1082	3	0	153	44
N	Transpose Exit Vols (EBL…SBR)		126	1	44	0	0	3	54	1082	6	1	153	21
O	Average Entry & Exit Vols = (F+N)/2		**86**	**1**	**44**	**0**	**0**	**1**	**101**	**1081**	**11**	**1**	**153**	**21**
P	Revised Sum of Approach Vol			131			1			1193			175	
R	Revised Dist of Approach Vol		66%	1%	34%	0%	0%	0%	8%	91%	1%	1%	87%	12%
	Rounded Volumes		**90**	**0**	**50**	**0**	**0**	**0**	**100**	**1075**	**10**	**0**	**150**	**20**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
19	Belvoir Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		36	41	3	5	29	56	5	92	81	69	51	20
B	Sum of Approach Vol			80			90			178			140	
C	Dist of Approach Vol		45%	51%	4%	6%	32%	62%	3%	52%	46%	49%	36%	14%
D	Approach Growth Factor			-5%			-60%			0%			0%	
E	New Appch Vol Sum = B x D			76			36			178			140	
F	Vol Based on Entry Dist. = C x E		34	39	2.84043	2	12	23	5	92	81	69	51	20
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		69	41	81	5	29	20	36	92	56	5	51	3
H	Sum of Exit Vol			191			54			184			59	
J	Dist of Exit Vol		36%	21%	42%	9%	54%	37%	20%	50%	30%	8%	86%	5%
K	Exit Growth Factor			-32%			-47%			324%			0%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			129			28		**781**	**281**	**531**		59	
M	Vol Based on Exit Dist = J x L		47	28	55	3	15	11	**104**	**266**	**162**	5	51	3
N	Transpose Exit Vols (EBL…SBR)		104	28	3	5	15	162	3	266	55	47	51	11
O	Average Entry & Exit Vols = (F+N)/2		**69**	**33**	**3**	**4**	**13**	**92**	**4**	**179**	**68**	**58**	**51**	**15**
P	Revised Sum of Approach Vol		105			109			251			124		
R	Revised Dist of Approach Vol		66%	32%	3%	3%	12%	84%	2%	71%	27%	47%	41%	12%
	Rounded Volumes		70	30	0	10	10	90	10	175	70	60	50	20
2	Volumes for northbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
20	Belvoir Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		25	0	7	0	0	0	24	57	0	0	30	18
B	Sum of Approach Vol			32			0			81			48	
C	Dist of Approach Vol		78%	0%	22%	0%	0%	0%	30%	70%	0%	0%	63%	38%
D	Approach Growth Factor			0%			0%			0%			0%	
E	New Appch Vol Sum = B x D			32			0			81			48	
F	Vol Based on Entry Dist. = C x E		25	0	7	0	0	0	24	57	0	0	30	18
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	24	0	18	25	57	0	0	30	7
H	Sum of Exit Vol			0			42			82			37	
J	Dist of Exit Vol		0%	0%	0%	57%	0%	43%	30%	70%	0%	0%	81%	19%
K	Exit Growth Factor			0%			0%			0%			0%	
L	New Exit Vol Sum = H x K			0			42			82			37	
M	Vol Based on Exit Dist = J x L		0	0	0	24	0	18	25	57	0	0	30	7
N	Transpose Exit Vols (EBL…SBR)		25	0	7	0	0	0	24	57	0	0	30	18
O	Average Entry & Exit Vols = (F+N)/2		**25**	**0**	**7**	**0**	**0**	**0**	**24**	**57**	**0**	**0**	**30**	**18**
P	Revised Sum of Approach Vol			32			0			81			48	
R	Revised Dist of Approach Vol		78%	0%	22%	0%	0%	0%	30%	70%	0%	0%	63%	38%
	Rounded Volumes		**30**	**0**	**10**	**0**	**0**	**0**	**30**	**60**	**0**	**0**	**30**	**20**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM No-Build									
	Growth Factors Based on Peak Period Link Volumes			2/5/2014										
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)					
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
21	Theote Rd	Pohick Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	236	59	6	573	0	475	0	43	0	0	0
B	Sum of Approach Vol			295			579			518			0	
C	Dist of Approach Vol		0%	80%	20%	1%	99%	0%	92%	0%	8%	0%	0%	0%
D	Approach Growth Factor			-25%			-13%			3%			0%	
E	New Appch Vol Sum = B x D			220			505			533			0	
F	Vol Based on Entry Dist. = C x E		0	176	43.9892	5	500	0	489	0	44	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	236	43	475	573	0	0	0	0	6	0	59
H	Sum of Exit Vol			279			1048			0			65	
J	Dist of Exit Vol		0%	85%	15%	45%	55%	0%	0%	0%	0%	9%	0%	91%
K	Exit Growth Factor			-2%			-27%			0%			35%	
L	New Exit Vol Sum = H x K			273			769			0			88	
M	Vol Based on Exit Dist = J x L		0	231	42	349	420	0	0	0	0	8	0	80
N	Transpose Exit Vols (EBL…SBR)		0	231	80	8	420	0	349	0	42	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**204**	**62**	**7**	**460**	**0**	**419**	**0**	**43**	**0**	**0**	**0**
P	Revised Sum of Approach Vol			265			467			462			0	
R	Revised Dist of Approach Vol		0%	77%	23%	1%	99%	0%	91%	0%	9%	0%	0%	0%
	Rounded Volumes		**0**	**200**	**60**	**10**	**450**	**0**	**425**	**0**	**40**	**0**	**0**	**0**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
22	Theote Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		10	27	6	16	6	84	4	279	69	10	22	4
B	Sum of Approach Vol			43			106			352			36	
C	Dist of Approach Vol		23%	63%	14%	15%	6%	79%	1%	79%	20%	28%	61%	11%
D	Approach Growth Factor			0%			0%			3%			35%	
E	New Appch Vol Sum = B x D			43			106			362			49	
F	Vol Based on Entry Dist. = C x E		10	27	6	16	6	84	4	287	71	14	30	5
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		10	27	69	4	6	4	10	279	84	16	22	6
H	Sum of Exit Vol			106			14			373			44	
J	Dist of Exit Vol		9%	25%	65%	29%	43%	29%	3%	75%	23%	36%	50%	14%
K	Exit Growth Factor			0%			0%			3%			35%	
L	New Exit Vol Sum = H x K			106			14			384			59	
M	Vol Based on Exit Dist = J x L		10	27	69	4	6	4	10	287	86	22	30	8
N	Transpose Exit Vols (EBL…SBR)		10	27	8	22	6	86	4	287	69	10	30	4
O	Average Entry & Exit Vols = (F+N)/2		10	27	7	19	6	85	4	287	70	12	30	5
P	Revised Sum of Approach Vol			44			110			361			46	
R	Revised Dist of Approach Vol		23%	61%	16%	17%	5%	77%	1%	79%	19%	25%	64%	10%
	Rounded Volumes		**10**	**30**	**10**	**20**	**10**	**90**	**10**	**300**	**70**	**10**	**30**	**10**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
23	Flagler Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		6	187	29	5	148	6	16	1	7	3	0	21
B	Sum of Approach Vol			222			159			24			24	
C	Dist of Approach Vol		3%	84%	13%	3%	93%	4%	67%	4%	29%	13%	0%	88%
D	Approach Growth Factor			-32%			-63%			0%			-10%	
E	New Approach Vol Sum = B x D			150			60			24			22	
F	Vol Based on Entry Dist. = C x E		4	127	19.6569	2	56	2	16	1	7	3	0	19
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		3	187	7	16	148	21	6	1	6	5	0	29
H	Sum of Exit Vol			197			185			13			34	
J	Dist of Exit Vol		2%	95%	4%	9%	80%	11%	46%	8%	46%	15%	0%	85%
K	Exit Growth Factor			-33%			-60%			-13%			0%	
L	New Exit Vol Sum = H x K			132			75			11			34	
M	Vol Based on Exit Dist = J x L		2	125	5	6	60	8	5	1	5	5	0	29
N	Transpose Exit Vols (EBL…SBR)		5	125	29	5	60	5	6	1	5	2	0	8
O	Average Entry & Exit Vols = (F+N)/2		5	126	24	3	58	4	11	1	6	2	0	14
P	Revised Sum of Approach Vol			155			65			18			16	
R	Revised Dist of Approach Vol		3%	81%	16%	5%	89%	6%	62%	5%	32%	15%	0%	85%
	Rounded Volumes		**10**	**125**	**30**	**0**	**60**	**10**	**10**	**0**	**10**	**0**	**0**	**20**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
24	Mt Vernon Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		65	0	12	0	0	0	3	175	0	0	233	51
B	Sum of Approach Vol			77			0			178			284	
C	Dist of Approach Vol		84%	0%	16%	0%	0%	0%	2%	98%	0%	0%	82%	18%
D	Approach Growth Factor			38%			0%			-46%			-25%	
E	New Approach Vol Sum = B x D			106			0			95			213	
F	Vol Based on Entry Dist. = C x E		89	0	16.5146	0	0	0	2	94	0	0	175	38
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	3	0	51	65	175	0	0	233	12
H	Sum of Exit Vol			0			54			240			245	
J	Dist of Exit Vol		0%	0%	0%	6%	0%	94%	27%	73%	0%	0%	95%	5%
K	Exit Growth Factor			0%			29%			-20%			-59%	
L	New Exit Vol Sum = H x K			0			70			192			100	
M	Vol Based on Exit Dist = J x L		0	0	0	4	0	66	52	140	0	0	95	5
N	Transpose Exit Vols (EBL…SBR)		52	0	5	0	0	0	4	140	0	0	95	66
O	Average Entry & Exit Vols = (F+N)/2		71	0	11	0	0	0	3	117	0	0	135	52
P	Revised Sum of Approach Vol			81			0			120			187	
R	Revised Dist of Approach Vol		87%	0%	13%	0%	0%	0%	2%	98%	0%	0%	72%	28%
	Rounded Volumes		**70**	**0**	**10**	**0**	**0**	**0**	**0**	**125**	**0**	**0**	**125**	**50**

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
25	Mt Vernon Rd	Gillespie Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		26	13	0	4	12	31	25	130	17	0	141	1
B	Sum of Approach Vol			39			47			172			142	
C	Dist of Approach Vol		67%	33%	0%	9%	26%	66%	15%	76%	10%	0%	99%	1%
D	Approach Growth Factor			-100%			0%			-33%			-59%	
E	New Approach Vol Sum = B x D			0			47			115			58	
F	Vol Based on Entry Dist. = C x E		0	0	0	4	12	31	17	87	11	0	58	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	13	17	25	12	1	26	130	31	4	141	0
H	Sum of Exit Vol			30			38			187			145	
J	Dist of Exit Vol		0%	43%	57%	66%	32%	3%	14%	70%	17%	3%	97%	0%
K	Exit Growth Factor			0%			-55%			-46%			-63%	
L	New Exit Vol Sum = H x K			30			17			100			54	
M	Vol Based on Exit Dist = J x L		0	13	17	11	5	0	14	70	17	2	53	0
N	Transpose Exit Vols (EBL…SBR)		14	13	0	2	5	17	11	70	17	0	53	0
O	Average Entry & Exit Vols = (F+N)/2		7	7	0	3	9	24	14	78	14	0	55	0
P	Revised Sum of Approach Vol			14			35			106			56	
R	Revised Dist of Approach Vol		52%	48%	0%	8%	25%	68%	13%	74%	13%	0%	99%	1%
	Rounded Volumes		**10**	**10**	**0**	**0**	**10**	**30**	**20**	**80**	**20**	**0**	**60**	**0**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
26	Gunston Rd	3rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		4	0	5	19	0	38	2	853	5	4	342	1
B	Sum of Approach Vol			9			57			860			347	
C	Dist of Approach Vol		0%	0%	0%	33%	0%	67%	0%	99%	1%	1%	99%	0%
D	Approach Growth Factor			0%			0%			71%			146%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			9			57			1472		853	792	822
F	Vol Based on Entry Dist. = C x E		0	0	0	19	0	38	3	1460	9	9	810	2
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		4	0	5	2	0	1	4	853	38	19	342	5
H	Sum of Exit Vol			9			3			895			366	
J	Dist of Exit Vol		44%	0%	56%	67%	0%	33%	0%	95%	4%	5%	93%	1%
K	Exit Growth Factor			0%			0%			75%			120%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			9			3			1566		**803**	**782**	**793**
M	Vol Based on Exit Dist = J x L		4	0	5	2	0	1	7	1492	66	**9**	**782**	**0**
N	Transpose Exit Vols (EBL…SBR)		7	0	0	9	0	66	2	1492	5	4	782	1
O	Average Entry & Exit Vols = (F+N)/2		3	0	0	14	0	52	3	1476	7	7	796	2
P	Revised Sum of Approach Vol			3			66			1486			805	
R	Revised Dist of Approach Vol		100%	0%	0%	21%	0%	79%	0%	99%	0%	1%	99%	0%
	Rounded Volumes		**0**	**0**	**0**	**20**	**0**	**50**	**0**	**1475**	**10**	**10**	**800**	**0**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS			Estimated 2017 Volumes Within Fort Belvoir - PM No-Build										
	Growth Factors Based on Peak Period Link Volumes		2/5/2014										
	Rounding Rules:		"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)			>100 Rnd to 25x (down if<25+11)				
	Actual values are displayed as whole numbers		Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols	
27	Gunston Rd	Jackson Loop S.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		59	0	49	0	0	0	21	642	0	0	438	23
B	Sum of Approach Vol			108			0			663			461	
C	Dist of Approach Vol		55%	0%	45%	0%	0%	0%	3%	97%	0%	0%	95%	5%
D	Approach Growth Factor			0%			0%			67%			120%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			108			0			1107		**1012**	**877**	**945**
F	Vol Based on Entry Dist. = C x E		59	0	49	0	0	0	35	1072	0	**0**	**898**	**47**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols	
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	21	0	23	59	642	0	0	438	49
H	Sum of Exit Vol			0			44			701			487	
J	Dist of Exit Vol		0%	0%	0%	48%	0%	52%	8%	92%	0%	0%	90%	10%
K	Exit Growth Factor			0%			0%			71%			96%	
L	New Exit Vol Sum = H x K			0			44			1200			952	
M	Vol Based on Exit Dist = J x L		0	0	0	21	0	23	101	1099	0	0	857	96
N	Transpose Exit Vols (EBL…SBR)		101	0	96	0	0	0	21	1099	0	0	857	23
O	Average Entry & Exit Vols = (F+N)/2		**80**	**0**	**72**	**0**	**0**	**0**	**28**	**1086**	**0**	**0**	**877**	**35**
P	Revised Sum of Approach Vol			152			0			1114			912	
R	Revised Dist of Approach Vol		52%	0%	48%	0%	0%	0%	3%	97%	0%	0%	96%	4%
	Rounded Volumes		**80**	**0**	**70**	**0**	**0**	**0**	**30**	**1100**	**0**	**0**	**875**	**40**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values								
Site	NS Steet	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
1	DLA West Gate	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	227	70	85	974	0	555	0	49	0	0	0
B	Sum of Approach Vol			297			1059			604			0	
C	Dist of Approach Vol		0%	76%	24%	8%	92%	0%	92%	0%	8%	0%	0%	0%
D	Approach Growth Factor			4%			19%			20%			0%	
E	New Approach Vol Sum = B x D			308			1263			726			0	
F	Vol Based on Entry Dist. = C x E		0	236	73	101	1162	0	667	0	59	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	227	49	555	974	0	0	0	0	85	0	70
H	Sum of Exit Vol			276			1529			0			155	
J	Dist of Exit Vol		0%	82%	18%	36%	64%	0%	0%	0%	0%	55%	0%	45%
K	Exit Growth Factor			25%			9%			0%			23%	
L	New Exit Vol Sum = H x K			344			1673			0			190	
M	Vol Based on Exit Dist = J x L		0	283	61	607	1065	0	0	0	0	104	0	85.8569
N	Transpose Exit Vols (EBL…SBR)		0	283	86	104	1065	0	607.093	0	61	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	259	79	103	1114	0	637	0	60	0	0	0
P	Revised Sum of Approach Vol			338			1217			697			0	
R	Revised Dist of Approach Vol		0%	77%	23%	8%	92%	0%	91%	0%	9%	0%	0%	0%
	Rounded Volumes		**0**	**250**	**80**	**100**	**1125**	**0**	**650**	**0**	**60**	**0**	**0**	**0**

Site	NS Steet	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
2	DLA East Gate	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	246	28	13	752	0	342	0	242	0	0	0
B	Sum of Approach Vol			274			765			584			0	
C	Dist of Approach Vol		0%	90%	10%	2%	98%	0%	59%	0%	41%	0%	0%	0%
D	Approach Growth Factor			25%			40%			20%			0%	
E	New Appch Vol Sum = B x D			341			1074			702			0	
F	Vol Based on Entry Dist. = C x E		0	306	35	18	1056	0	411	0	291	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	246	242	342	752	0	0	0	0	13	0	28
H	Sum of Exit Vol			488			1094			0			41	
J	Dist of Exit Vol		0%	50%	50%	31%	69%	0%	0%	0%	0%	32%	0%	68%
K	Exit Growth Factor			60%			19%			0%			23%	
L	New Exit Vol Sum = H x K			783			1305			0			50	
M	Vol Based on Exit Dist = J x L		0	395	388	408	897	0	0	0	0	16	0	34
N	Transpose Exit Vols (EBL…SBR)		0	395	34	16	897	0	408	0	388	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	350	35	17	977	0	410	0	340	0	0	0
P	Revised Sum of Approach Vol			385			994			749			0	
R	Revised Dist of Approach Vol		0%	91%	9%	2%	98%	0%	55%	0%	45%	0%	0%	0%
	Rounded Volumes		**0**	**350**	**40**	**20**	**975**	**0**	**400**	**0**	**350**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1									
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
3	Beulah St	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		195	306	10	10	581	555	134	71	47	234	11	32
B	Sum of Approach Vol			511			1146			252			277	
C	Dist of Approach Vol		38%	60%	2%	1%	51%	48%	53%	28%	19%	84%	4%	12%
D	Approach Growth Factor			60%			11%			55%			-22%	
E	New Approach Vol Sum = B x D			820			1273			391			217	
F	Vol Based on Entry Dist. = C x E		313	491	16	11	645	616	208	110	73	183	9	25
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		234	306	47	134	581	32	195	71	555	10	11	10
H	Sum of Exit Vol			587			747			821			31	
J	Dist of Exit Vol		40%	52%	8%	18%	78%	4%	24%	9%	68%	32%	35%	32%
K	Exit Growth Factor			13%			40%			-13%			48%	
L	New Exit Vol Sum = H x K			664			1049			715			46	
M	Vol Based on Exit Dist = J x L		265	346	53	188	816	45	170	62	483	15	16	15
N	Transpose Exit Vols (EBL...SBR)		170	346	15	15	816	483	188	62	53	265	16	45
O	Average Entry & Exit Vols = (F+N)/2		241	418	15	13	731	550	198	86	63	224	12	35
P	Revised Sum of Approach Vol			675			1293			347			271	
R	Revised Sist of Approach Vol		36%	62%	2%	1%	56%	43%	57%	25%	18%	83%	5%	13%
	Rounded Volumes		**250**	**425**	**20**	**10**	**725**	**550**	**200**	**90**	**60**	**225**	**10**	**40**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
4	Gunston Rd	Kingman Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	15	523	6	26	0	1318	0	8	0	0	0
B	Sum of Approach Vol			538			32			1326			0	
C	Dist of Approach Vol		0%	3%	97%	19%	81%	0%	99%	0%	1%	0%	0%	0%
D	*Approach Growth Factor based on rebalanced screenline east of Gunston*			13%			24%			89%			0%	
E	New Appch Vol Sum = B x D			608			40			2507		0		
F	Vol Based on Entry Dist. = C x E		0	17	591	7	32	0	2492	0	15	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	15	8	1318	26	0	0	0	0	6	0	523
H	Sum of Exit Vol			23			1344			0			529	
J	Dist of Exit Vol		0%	65%	35%	98%	2%	0%	0%	0%	0%	1%	0%	99%
K	*Exit Growth Factor based on rebalanced screenline east of Gunston*			-16%			11%			0%			190%	
L	New Exit Vol Sum = H x K			19			1493			0			1533	
M	Vol Based on Exit Dist = J x L		0	13	7	1464	29	0	0	0	0	17	0	1515
N	Transpose Exit Vols (EBL...SBR)		0	13	1515	17	29	0	1464	0	7	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		**0**	**15**	**1053**	**12**	**30**	**0**	**1978**	**0**	**11**	**0**	**0**	**0**
P	Revised Sum of Approach Vol			1068			43			1989			0	
R	Revised Dist of Approach Vol		0%	1%	99%	29%	71%	0%	99%	0%	1%	0%	0%	0%
	Rounded Volumes		**0**	**20**	**1050**	**10**	**30**	**0**	**1975**	**0**	**10**	**0**	**0**	**0**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
5	Woodlawn	Gorgas	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		11	232	47	1	82	14	29	2	1	17	1	10
B	Sum of Approach Vol			290			97			32			28	
C	Dist of Approach Vol		4%	80%	16%	1%	85%	14%	91%	6%	3%	61%	4%	36%
D	*proach Growth Factor based on rebalanced screenline east of Gunston*			407%			0%			-17%			-16%	
E	New Approach Vol Sum = B x D			1471			97			26			23	
F	Vol Based on Entry Dist. = C x E		37	777	157	1	82	14	24	2	1	14	1	8
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		17	232	1	29	82	10	11	2	14	1	1	47
H	Sum of Exit Vol			250			121			27			49	
J	Dist of Exit Vol		7%	93%	0%	24%	68%	8%	41%	7%	52%	2%	2%	96%
K	*Exit Growth Factor based on rebalanced screenline east of Gunston*			-13%			20%			24%			-3%	
L	New Exit Vol Sum = H x K			218			145			33			47	
M	Vol Based on Exit Dist = J x L		15	202	1	35	98	12	14	2	17	1	1	46
N	Transpose Exit Vols (EBL…SBR)		14	202	46	1	98	17	35	2	1	15	1	12
O	Average Entry & Exit Vols = (F+N)/2		25	490	102	1	90	16	29	2	1	15	1	10
P	Revised Sum of Approach Vol			617			107			32			26	
R	Revised Dist of Approach Vol		4%	79%	16%	1%	84%	15%	91%	6%	3%	57%	4%	40%
	Rounded Volumes		**30**	**500**	**100**	**0**	**90**	**20**	**30**	**0**	**0**	**20**	**0**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
6	Gunston Rd	Abbott Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		15	2	5	76	0	48	1	1116	107	44	341	3
B	Sum of Approach Vol			22			124			1224			388	
C	Dist of Approach Vol		68%	9%	23%	61%	0%	39%	0%	91%	9%	11%	88%	1%
D	*proach Growth Factor based on rebalanced screenline east of Gunston*			0%			-74%			153%			214%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			22			32		**3091**	**2352**	**2721**	1219	1340	0
F	Vol Based on Entry Dist. = C x E		15	2	5	20	0	12	**2**	**2481**	**238**	138	1071	9
			Eastbound Out			Westbound out			Northbound out			Southbound Out		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		44	2	107	1	0	3	15	1116	48	76	341	5
H	Sum of Exit Vol			153			4			1179			422	
J	Dist of Exit Vol		29%	1%	70%	25%	0%	75%	1%	95%	4%	18%	81%	1%
K	*Exit Growth Factor based on rebalanced screenline east of Gunston*			-18%			0%			104%			477%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			126			4			2403		**2434**	**1324**	**1879**
M	Vol Based on Exit Dist = J x L		36	2	88	1	0	3	31	2275	98	**338**	**1519**	**22**
N	Transpose Exit Vols (EBL…SBR)		31	2	22	338	0	98	1	2275	88	36	1519	3
O	Average Entry & Exit Vols = (F+N)/2		23	2	14	179	0	55	2	2378	163	87	1295	6
P	Revised Sum of Approach Vol			38			234			2542			1388	
R	Revised Dist of Approach Vol		60%	5%	36%	76%	0%	24%	0%	94%	6%	6%	93%	0%
	Rounded Volumes		**20**	**0**	**20**	**175**	**0**	**60**	**0**	**2375**	**175**	**90**	**1300**	**10**
1	Entry volumes for northbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Exit volumes for southbound exits based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values								
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
7	Gunston Rd	Goethals Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		14	1	8	46	1	52	3	1166	66	11	410	2
B	Sum of Approach Vol			23			99			1235			423	
C	Dist of Approach Vol		61%	4%	35%	46%	1%	53%	0%	94%	5%	3%	97%	0%
D	*proach Growth Factor based on rebalanced screenline east of Gunston*			0%			23%			72%			477%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			23		**122**	**129**	**125**		2127		**2440**	**1084**	**1762**
F	Vol Based on Entry Dist. = C x E		14	1	8	**58**	**1**	**66**	5	2008	114	**46**	**1708**	**8**
			Eastbound Out			Westbound out			Northbound out			Southbound Out		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		11	1	66	3	1	2	14	1166	52	46	410	8
H	Sum of Exit Vol			78			6			1232			464	
J	Dist of Exit Vol		14%	1%	85%	50%	17%	33%	1%	95%	4%	10%	88%	2%
K	*Exit Growth Factor based on rebalanced screenline east of Gunston*			-17%			0%			115%			356%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)		65	156	0		6		**2649**	**2192**	**2421**	**2115**	**1288**	**1701**
M	Vol Based on Exit Dist = J x L		9	1	55	3	1	2	**28**	**2291**	**102**	**169**	**1503**	**29**
N	Transpose Exit Vols (EBL...SBR)		28	1	29	169	1	102	3	2291	55	9	1503	2
O	Average Entry & Exit Vols = (F+N)/2		21	1	19	113	1	84	4	2150	84	27	1606	5
P	Revised Sum of Approach Vol			40			199			2238			1638	
R	Revised Dist of Approach Vol		51%	2%	46%	57%	1%	42%	0%	96%	4%	2%	98%	0%
	Rounded Volumes		**20**	**0**	**20**	**125**	**0**	**90**	**10**	**2150**	**90**	**30**	**1600**	**10**
1	Entry volumes for westbound and southbound approaches based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for northbound and southbound exits based on average of volumes from growth factor and absolute volume increase.													

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
8	Gunston Rd	1st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	9	0	387	0	889	15	148	336	0
B	Sum of Approach Vol			0			396			904			484	
C	Dist of Approach Vol		0%	0%	0%	2%	0%	98%	0%	98%	2%	31%	69%	0%
D	Approach Growth Factor			0%			0%			78%			131%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			0			396			1610		**1117**	**901**	**1009**
F	Vol Based on Entry Dist. = C x E		0	0	0	9	0	387	0	1583	27	**309**	**700**	**0**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		148	0	15	0	0	0	0	889	387	9	336	0
H	Sum of Exit Vol			163			0			1276			345	
J	Dist of Exit Vol		91%	0%	9%	0%	0%	0%	0%	70%	30%	3%	97%	0%
K	Exit Growth Factor			0%			0%			78%			131%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			163			0			2272		**796**	**762**	**779**
M	Vol Based on Exit Dist = J x L		148	0	15	0	0	0	0	1583	689	**20**	**759**	**0**
N	Transpose Exit Vols (EBL...SBR)		0	0	0	20	0	689	0	1583	15	148	759	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	15	0	538	0	1583	21	228	730	0
P	Revised Sum of Approach Vol			0			553			1604			958	
R	Revised Dist of Approach Vol		0%	0%	0%	3%	0%	97%	0%	99%	1%	24%	76%	0%
	Rounded Volumes		**0**	**0**	**0**	**20**	**0**	**550**	**0**	**1575**	**20**	**225**	**725**	**0**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1									
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
9	Gunston Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	18	0	124	0	480	28	125	469	0
B	Sum of Approach Vol			0			142			508			594	
C	Dist of Approach Vol		0%	0%	0%	13%	0%	87%	0%	94%	6%	21%	79%	0%
D	Approach Growth Factor			0%			-100%			134%			82%	
E	New Appch Vol Sum = B x D			0			0			1187			1080	
F	Vol Based on Entry Dist. = C x E		0	0	0	0	0	0	0	1122	65	227	853	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		125	0	28	0	0	0	0	480	124	18	469	0
H	Sum of Exit Vol			153			0			604			487	
J	Dist of Exit Vol		82%	0%	18%	0%	0%	0%	0%	79%	21%	4%	96%	0%
K	Exit Growth Factor			-99%			0%			71%			137%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			1			0			1030		**1154**	**848**	**1001**
M	Vol Based on Exit Dist = J x L		1	0	0	0	0	0	0	819	211	**37**	**964**	**0**
N	Transpose Exit Vols (EBL...SBR)		0	0	0	37	0	211	0	819	0	1	964	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	19	0	106	0	970	33	114	908	0
P	Revised Sum of Approach Vol			0			124			1003			1022	
R	Revised Dist of Approach Vol		0%	0%	0%	15%	0%	85%	0%	97%	3%	11%	89%	0%
	Rounded Volumes		**0**	**0**	**0**	**20**	**0**	**100**	**0**	**975**	**30**	**125**	**900**	**0**
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
10	Gunston Rd	Pohick Rd/12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		123	136	46	67	184	179	177	218	57	111	123	213
B	Sum of Approach Vol			305			430			452			447	
C	Dist of Approach Vol		40%	45%	15%	16%	43%	42%	39%	48%	13%	25%	28%	48%
D	Approach Growth Factor			1%			19%			7%			137%	
E	New Approach Vol Sum = B x D			308			510			483		1059	808	933
F	Vol Based on Entry Dist. = C x E		124	138	46.5152	79	218	212	189	233	61	232	257	445
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		111	136	57	177	184	213	123	218	179	67	123	46
H	Sum of Exit Vol			304			574			520			236	
J	Dist of Exit Vol		37%	45%	19%	31%	32%	37%	24%	42%	34%	28%	52%	19%
K	Exit Growth Factor			1%			-12%			134%			44%	
L	New Exit Vol Sum = H x K			307			506			1215			339	
M	Vol Based on Exit Dist = J x L		112	138	58	156	162	188	287	509	418	96	177	66
N	Transpose Exit Vols (EBL...SBR)		287	138	66	96	162	418	156	509	58	112	177	188
O	Average Entry & Exit Vols = (F+N)/2		206	138	56	88	190	315	173	371	59	172	217	316
P	Revised Sum of Approach Vol			400			593			603			705	
R	Revised Dist of Approach Vol		52%	34%	14%	15%	32%	53%	29%	62%	10%	24%	31%	45%
	Rounded Volumes		**200**	**150**	**60**	**90**	**200**	**325**	**175**	**375**	**60**	**175**	**225**	**325**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)		
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values								
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
11	Gunston Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		35	48	6	4	34	103	20	265	8	30	76	31
B	Sum of Approach Vol			89			141			293			137	
C	Dist of Approach Vol		39%	54%	7%	3%	24%	73%	7%	90%	3%	22%	55%	23%
D	Approach Growth Factor			0%			0%			7%			44%	
E	New Approach Vol Sum = B x D			89			141			313			197	
F	Vol Based on Entry Dist. = C x E		35	48	6	4	34	103	21	283	9	43	109	45
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		30	48	8	20	34	31	35	265	103	4	76	6
H	Sum of Exit Vol			86			85			403			86	
J	Dist of Exit Vol		35%	56%	9%	24%	40%	36%	9%	66%	26%	5%	88%	7%
K	Exit Growth Factor			0%			0%			7%			44%	
L	New Exit Vol Sum = H x K			86			85			430			124	
M	Vol Based on Exit Dist = J x L		30	48	8	20	34	31	37	283	110	6	109	9
N	Transpose Exit Vols (EBL…SBR)		37	48	9	6	34	110	20	283	8	30	109	31
O	Average Entry & Exit Vols = (F+N)/2		36	48	7	5	34	106	21	283	8	37	109	38
P	Revised Sum of Approach Vol			92			145			312			184	
R	Revised Dist of Approach Vol		40%	52%	8%	3%	23%	73%	7%	91%	3%	20%	60%	21%
	Rounded Volumes		**40**	**50**	**10**	**10**	**40**	**100**	**20**	**275**	**10**	**40**	**100**	**40**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
12	Gunston Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		2	11	22	3	38	8	276	136	7	11	44	4
B	Sum of Approach Vol			35			49			419			59	
C	Dist of Approach Vol		6%	31%	63%	6%	78%	16%	66%	32%	2%	19%	75%	7%
D	Approach Growth Factor			44%			-41%			8%			44%	
E	New Approach Vol Sum = B x D			50			29			454			85	
F	Vol Based on Entry Dist. = C x E		3	16	31.5806	2	22	5	299	147	8	16	63	6
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		11	11	7	276	38	4	2	136	8	3	44	22
H	Sum of Exit Vol			29			318			146			69	
J	Dist of Exit Vol		38%	38%	24%	87%	12%	1%	1%	93%	5%	4%	64%	32%
K	Exit Growth Factor			10%			7%			7%			9%	
L	New Exit Vol Sum = H x K			32			339			156			75	
M	Vol Based on Exit Dist = J x L		12	12	8	294	41	4	2	145	9	3	48	24
N	Transpose Exit Vols (EBL…SBR)		2	12	24	3	41	9	294	145	8	12	48	4
O	Average Entry & Exit Vols = (F+N)/2		3	14	28	3	31	7	297	146	8	14	56	5
P	Revised Sum of Approach Vol			44			41			451			75	
R	Revised Dist of Approach Vol		6%	32%	63%	6%	77%	16%	66%	32%	2%	19%	75%	7%
	Rounded Volumes		**0**	**20**	**30**	**0**	**30**	**10**	**300**	**150**	**10**	**20**	**60**	**10**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1									
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
13	Gunston Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	0	0	6	0	50	0	387	108	27	15	0
B	Sum of Approach Vol			0			56			495			42	
C	Dist of Approach Vol		0%	0%	0%	11%	0%	89%	0%	78%	22%	64%	36%	0%
D	Approach Growth Factor			0%			0%			8%			9%	
E	New Approach Vol Sum = B x D			0			56			536			46	
F	Vol Based on Entry Dist. = C x E		0	0	0	6	0	50	0	419	117	29	16	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		27	0	108	0	0	0	0	387	50	6	15	0
H	Sum of Exit Vol			135			0			437			21	
J	Dist of Exit Vol		20%	0%	80%	0%	0%	0%	0%	89%	11%	29%	71%	0%
K	Exit Growth Factor			0%			0%			8%			9%	
L	New Exit Vol Sum = H x K			135			0			473			23	
M	Vol Based on Exit Dist = J x L		27	0	108	0	0	0	0	419	54	7	16	0
N	Transpose Exit Vols (EBL…SBR)		0	0	0	7	0	54	0	419	108	27	16	0
O	Average Entry & Exit Vols = (F+N)/2		0	0	0	6	0	52	0	419	112	28	16	0
P	Revised Sum of Approach Vol			0			58			532			44	
R	Revised Dist of Approach Vol		0%	0%	0%	11%	0%	89%	0%	79%	21%	63%	37%	0%
	Rounded Volumes		**0**	**0**	**0**	**10**	**0**	**50**	**0**	**425**	**125**	**30**	**20**	**0**
Site			Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
14	Belvoir Hospital Traffic Circle		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		347	9	149	8	1	6	51	535	30	5	110	75
B	Sum of Approach Vol			505			15			616			190	
C	Dist of Approach Vol		69%	2%	30%	53%	7%	40%	8%	87%	5%	3%	58%	39%
D	Approach Growth Factor			0%			0%			-18%			-20%	
E	New Approach Vol Sum = B x D			505			15			505			151	
F	Vol Based on Entry Dist. = C x E		347	9	149	8	1	6	42	439	25	4	88	60
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		5	9	30	51	1	75	347	535	6	8	110	149
H	Sum of Exit Vol			44			127			888			267	
J	Dist of Exit Vol		11%	20%	68%	40%	1%	59%	39%	60%	1%	3%	41%	56%
K	Exit Growth Factor			0%			0%			-18%			-20%	
L	New Exit Vol Sum = H x K			44			127			728			213	
M	Vol Based on Exit Dist = J x L		5	9	30	51	1	75	284	439	5	6	88	119
N	Transpose Exit Vols (EBL…SBR)		284	9	119	6	1	5	51	439	30	5	88	75
O	Average Entry & Exit Vols = (F+N)/2		316	9	134	7	1	5	46	439	27	4	88	67
P	Revised Sum of Approach Vol			459			14			512			160	
R	Revised Dist of Approach Vol		69%	2%	29%	53%	7%	40%	9%	86%	5%	3%	55%	42%
	Rounded Volumes		**325**	**10**	**125**	**10**	**0**	**10**	**50**	**450**	**30**	**10**	**90**	**70**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1									
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
15	Belvoir Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		66	41	81	0	0	0	69	493	182	3	177	7
B	Sum of Approach Vol			188			0			744			187	
C	Dist of Approach Vol		35%	22%	43%	0%	0%	0%	9%	66%	24%	2%	95%	4%
D	Approach Growth Factor			0%			-26%			-17%			-20%	
E	New Approach Vol Sum = B x D			188			0			621			149	
F	Vol Based on Entry Dist. = C x E		66	41	81	0	0	0	58	411	152	2	141	6
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		3	41	182	69	0	7	66	493	0	0	177	81
H	Sum of Exit Vol			226			76			559			258	
J	Dist of Exit Vol		1%	18%	81%	91%	0%	9%	12%	88%	0%	0%	69%	31%
K	Exit Growth Factor			-19%			0%			-18%			-23%	
L	New Exit Vol Sum = H x K			183			76			458			199	
M	Vol Based on Exit Dist = J x L		2	33	148	69	0	7	54	404	0	0	137	63
N	Transpose Exit Vols (EBL…SBR)		54	33	63	0	0	0	69	404	148	2	137	7
O	Average Entry & Exit Vols = (F+N)/2		60	37	72	0	0	0	63	408	150	2	139	6
P	Revised Sum of Approach Vol			169			0			621			148	
R	Revised Dist of Approach Vol		36%	22%	42%	0%	0%	0%	10%	66%	24%	2%	94%	4%
	Rounded Volumes		**60**	**40**	**70**	**0**	**0**	**0**	**60**	**400**	**150**	**0**	**150**	**10**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
16	Belvoir Rd	9th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		171	16	23	3	7	7	57	450	9	12	180	131
B	Sum of Approach Vol			210			17			516			323	
C	Dist of Approach Vol		81%	8%	11%	18%	41%	41%	11%	87%	2%	4%	56%	41%
D	Approach Growth Factor			-99%			-53%			-20%			-23%	
E	New Approach Vol Sum = B x D			1			8			415			250	
F	Vol Based on Entry Dist. = C x E		1	0	0	1	3	3	46	362	7	9	139	101
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		12	16	9	57	7	131	171	450	7	3	180	23
H	Sum of Exit Vol			37			195			628			206	
J	Dist of Exit Vol		32%	43%	24%	29%	4%	67%	27%	72%	1%	1%	87%	11%
K	Exit Growth Factor		-100%			-100%			-17%			-3%		
L	New Exit Vol Sum = H x K			0			0			524			199	
M	Vol Based on Exit Dist = J x L		0	0	0	0	0	0	143	375	6	3	174	22
N	Transpose Exit Vols (EBL…SBR)		143	0	22	3	0	6	0	375	0	0	174	0
O	Average Entry & Exit Vols = (F+N)/2		72	0	11	2	2	5	23	369	4	5	157	51
P	Revised Sum of Approach Vol		83			8			395			212		
R	Revised Dist of Approach Vol		86%	0%	13%	26%	20%	55%	6%	93%	1%	2%	74%	24%
	Rounded Volumes		**70**	**0**	**10**	**0**	**0**	**10**	**20**	**375**	**10**	**10**	**150**	**50**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
17	Belvoir Rd	12th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		163	0	182	0	0	0	235	266	0	0	70	121
B	Sum of Approach Vol			345			0			501			191	
C	Dist of Approach Vol		47%	0%	53%	0%	0%	0%	47%	53%	0%	0%	37%	63%
D	Approach Growth Factor			-34%			0%			**414%**			-3%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			228			0		**2576**	**619**	**1597**		185	
F	Vol Based on Entry Dist. = C x E		108	0	120	0	0	0	**290**	**329**	**0**	0	68	117
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	235	0	121	163	266	0	0	70	182
H	Sum of Exit Vol			0			356			429			252	
J	Dist of Exit Vol		0%	0%	0%	66%	0%	34%	38%	62%	0%	0%	28%	72%
K	Exit Growth Factor			0%			-3%			-20%			-75%	
L	New Exit Vol Sum = H x K			0			345			345			63	
M	Vol Based on Exit Dist = J x L		0	0	0	228	0	117	131	214	0	0	18	46
N	Transpose Exit Vols (EBL…SBR)		131	0	46	0	0	0	228	214	0	0	18	117
O	Average Entry & Exit Vols = (F+N)/2		119	0	83	0	0	0	259	271	0	0	43	117
P	Revised Sum of Approach Vol			202			0			530			160	
R	Revised Dist of Approach Vol		59%	0%	41%	0%	0%	0%	49%	51%	0%	0%	27%	73%
	Rounded Volumes		**125**	**0**	**80**	**0**	**0**	**0**	**250**	**275**	**0**	**0**	**40**	**125**
1	Entry volumes fornorthbound approach based on average of volumes from growth factor and absolute volume increase.													

Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
18	Belvoir Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		46	1	44	0	0	1	54	396	6	1	153	21
B	Sum of Approach Vol			91			1			456			175	
C	Dist of Approach Vol		51%	1%	48%	0%	0%	0%	12%	87%	1%	1%	87%	12%
D	Approach Growth Factor			0%			0%			414%			11%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			91			1		**2344**	**574**	**1459**		194	
F	Vol Based on Entry Dist. = C x E		46	1	44	0	0	0	**173**	**1267**	**19**	1	169	23
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		1	1	6	54	0	21	46	396	1	0	153	44
H	Sum of Exit Vol			8			75			443			197	
J	Dist of Exit Vol		13%	13%	75%	72%	0%	28%	10%	89%	0%	0%	78%	22%
K	Exit Growth Factor			0%			0%			414%			11%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			8			75		**2277**	**561**	**1419**		218	
M	Vol Based on Exit Dist = J x L		1	1	6	54	0	21	**147**	**1269**	**3**	0	169	49
N	Transpose Exit Vols (EBL…SBR)		147	1	49	0	0	3	54	1269	6	1	169	21
O	Average Entry & Exit Vols = (F+N)/2		97	1	46	0	0	2	113	1268	13	1	169	22
P	Revised Sum of Approach Vol			144			2			1394			193	
R	Revised Dist of Approach Vol		67%	1%	32%	0%	0%	0%	8%	91%	1%	1%	88%	11%
	Rounded Volumes		**100**	**0**	**50**	**0**	**0**	**0**	**125**	**1275**	**10**	**0**	**175**	**20**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
19	Belvoir Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		36	41	3	5	29	56	5	92	81	69	51	20
B	Sum of Approach Vol			80			90			178			140	
C	Dist of Approach Vol		45%	51%	4%	6%	32%	62%	3%	52%	46%	49%	36%	14%
D	Approach Growth Factor			10%			-55%			0%			11%	
E	New Appch Vol Sum = B x D			88			41			178			155	
F	Vol Based on Entry Dist. = C x E		40	45	3.31044	2	13	25	5	92	81	76	56	22
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		69	41	81	5	29	20	36	92	56	5	51	3
H	Sum of Exit Vol			191			54			184			59	
J	Dist of Exit Vol		36%	21%	42%	9%	54%	37%	20%	50%	30%	8%	86%	5%
K	Exit Growth Factor			-23%			-41%			414%			0%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			148			32		**946**	**302**	**624**		59	
M	Vol Based on Exit Dist = J x L		53	32	63	3	17	12	**122**	**312**	**190**	5	51	3
N	Transpose Exit Vols (EBL...SBR)		122	32	3	5	17	190	3	312	63	53	51	12
O	Average Entry & Exit Vols = (F+N)/2		81	38	3	4	15	108	4	202	72	65	54	17
P	Revised Sum of Approach Vol			123			126			278			136	
R	Revised Dist of Approach Vol		66%	31%	3%	3%	12%	85%	1%	73%	26%	48%	40%	13%
	Rounded Volumes		**80**	**40**	**0**	**10**	**20**	**100**	**10**	**200**	**70**	**70**	**60**	**20**
2	Volumes for northbound exit based on average of volumes from growth factor and absolute volume increase.													
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
20	Belvoir Rd	23rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		25	0	7	0	0	0	24	57	0	0	30	18
B	Sum of Approach Vol			32			0			81			48	
C	Dist of Approach Vol		78%	0%	22%	0%	0%	0%	30%	70%	0%	0%	63%	38%
D	Approach Growth Factor			0%			0%			0%			0%	
E	New Appch Vol Sum = B x D			32			0			81			48	
F	Vol Based on Entry Dist. = C x E		25	0	7	0	0	0	24	57	0	0	30	18
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	24	0	18	25	57	0	0	30	7
H	Sum of Exit Vol			0			42			82			37	
J	Dist of Exit Vol		0%	0%	0%	57%	0%	43%	30%	70%	0%	0%	81%	19%
K	Exit Growth Factor			0%			0%			0%			0%	
L	New Exit Vol Sum = H x K			0			42			82			37	
M	Vol Based on Exit Dist = J x L		0	0	0	24	0	18	25	57	0	0	30	7
N	Transpose Exit Vols (EBL...SBR)		25	0	7	0	0	0	24	57	0	0	30	18
O	Average Entry & Exit Vols = (F+N)/2		25	0	7	0	0	0	24	57	0	0	30	18
P	Revised Sum of Approach Vol		32			0			81			48		
R	Revised Dist of Approach Vol		78%	0%	22%	0%	0%	0%	30%	70%	0%	0%	63%	38%
	Rounded Volumes		**30**	**0**	**10**	**0**	**0**	**0**	**30**	**60**	**0**	**0**	**30**	**20**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values									
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
21	Theote Rd	Pohick Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		0	236	59	6	573	0	475	0	43	0	0	0
B	Sum of Approach Vol			295			579			518			0	
C	Dist of Approach Vol		0%	80%	20%	1%	99%	0%	92%	0%	8%	0%	0%	0%
D	Approach Growth Factor			-15%			-12%			7%			0%	
E	New Appch Vol Sum = B x D			252			511			552			0	
F	Vol Based on Entry Dist. = C x E		0	202	50.3934	5	506	0	507	0	46	0	0	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	236	43	475	573	0	0	0	0	6	0	59
H	Sum of Exit Vol			279			1048			0			65	
J	Dist of Exit Vol		0%	85%	15%	45%	55%	0%	0%	0%	0%	9%	0%	91%
K	Exit Growth Factor			1%			-22%			0%			44%	
L	New Exit Vol Sum = H x K			282			821			0			94	
M	Vol Based on Exit Dist = J x L		0	239	43	372	449	0	0	0	0	9	0	85
N	Transpose Exit Vols (EBL...SBR)		0	239	85	9	449	0	372	0	43	0	0	0
O	Average Entry & Exit Vols = (F+N)/2		0	220	68	7	477	0	439	0	45	0	0	0
P	Revised Sum of Approach Vol			288			484			484			0	
R	Revised Dist of Approach Vol		0%	76%	24%	1%	99%	0%	91%	0%	9%	0%	0%	0%
	Rounded Volumes		**0**	**225**	**70**	**10**	**475**	**0**	**450**	**0**	**50**	**0**	**0**	**0**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
22	Theote Rd	16th St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		10	27	6	16	6	84	4	279	69	10	22	4
B	Sum of Approach Vol			43			106			352			36	
C	Dist of Approach Vol		23%	63%	14%	15%	6%	79%	1%	79%	20%	28%	61%	11%
D	Approach Growth Factor			0%			0%			7%			44%	
E	New Appch Vol Sum = B x D			43			106			375			52	
F	Vol Based on Entry Dist. = C x E		10	27	6	16	6	84	4	298	74	14	32	6
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		10	27	69	4	6	4	10	279	84	16	22	6
H	Sum of Exit Vol			106			14			373			44	
J	Dist of Exit Vol		9%	25%	65%	29%	43%	29%	3%	75%	23%	36%	50%	14%
K	Exit Growth Factor			0%			0%			7%			44%	
L	New Exit Vol Sum = H x K			106			14			398			63	
M	Vol Based on Exit Dist = J x L		10	27	69	4	6	4	11	298	90	23	32	9
N	Transpose Exit Vols (EBL...SBR)		11	27	9	23	6	90	4	298	69	10	32	4
O	Average Entry & Exit Vols = (F+N)/2		10	27	7	19	6	87	4	298	71	12	32	5
P	Revised Sum of Approach Vol			45			112			373			49	
R	Revised Dist of Approach Vol		23%	60%	16%	17%	5%	77%	1%	80%	19%	25%	65%	10%
	Rounded Volumes		**10**	**30**	**10**	**20**	**10**	**90**	**10**	**300**	**70**	**10**	**30**	**10**

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes				1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)				>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers				Products are based on mutiplication of actual values								
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
23	Flagler Rd	21st St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		6	187	29	5	148	6	16	1	7	3	0	21
B	Sum of Approach Vol			222			159			24			24	
C	Dist of Approach Vol		3%	84%	13%	3%	93%	4%	67%	4%	29%	13%	0%	88%
D	Approach Growth Factor			-23%			-57%			0%			-7%	
E	New Approach Vol Sum = B x D			172			68			24			22	
F	Vol Based on Entry Dist. = C x E		5	145	22.4477	2	63	3	16	1	7	3	0	20
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		3	187	7	16	148	21	6	1	6	5	0	29
H	Sum of Exit Vol			197			185			13			34	
J	Dist of Exit Vol		2%	95%	4%	9%	80%	11%	46%	8%	46%	15%	0%	85%
K	Exit Growth Factor			-23%			-55%			-6%			0%	
L	New Exit Vol Sum = H x K			151			84			12			34	
M	Vol Based on Exit Dist = J x L		2	143	5	7	67	10	6	1	6	5	0	29
N	Transpose Exit Vols (EBL...SBR)		6	143	29	5	67	6	7	1	5	2	0	10
O	Average Entry & Exit Vols = (F+N)/2		5	144	26	4	65	4	12	1	6	3	0	15
P	Revised Sum of Approach Vol			175			73			19			17	
R	Revised Dist of Approach Vol		3%	82%	15%	5%	89%	6%	62%	5%	33%	15%	0%	85%
	Rounded Volumes		**10**	**150**	**30**	**10**	**70**	**10**	**10**	**0**	**10**	**0**	**0**	**20**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
24	Mt Vernon Rd	Surveyor Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		65	0	12	0	0	0	3	175	0	0	233	51
B	Sum of Approach Vol			77			0			178			284	
C	Dist of Approach Vol		84%	0%	16%	0%	0%	0%	2%	98%	0%	0%	82%	18%
D	Approach Growth Factor			37%			0%			-38%			-23%	
E	New Approach Vol Sum = B x D			106			0			109			217	
F	Vol Based on Entry Dist. = C x E		89	0	16.4678	0	0	0	2	108	0	0	178	39
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	3	0	51	65	175	0	0	233	12
H	Sum of Exit Vol			0			54			240			245	
J	Dist of Exit Vol		0%	0%	0%	6%	0%	94%	27%	73%	0%	0%	95%	5%
K	Exit Growth Factor			0%			27%			-15%			-56%	
L	New Exit Vol Sum = H x K			0			69			204			109	
M	Vol Based on Exit Dist = J x L		0	0	0	4	0	65	55	149	0	0	104	5
N	Transpose Exit Vols (EBL...SBR)		55	0	5	0	0	0	4	149	0	0	104	65
O	Average Entry & Exit Vols = (F+N)/2		72	0	11	0	0	0	3	128	0	0	141	52
P	Revised Sum of Approach Vol			83			0			131			193	
R	Revised Dist of Approach Vol		87%	0%	13%	0%	0%	0%	2%	98%	0%	0%	73%	27%
	Rounded Volumes		**70**	**0**	**10**	**0**	**0**	**0**	**0**	**125**	**0**	**0**	**150**	**50**

FORT BELVOIR TMP TRAFFIC ANALYSIS						Estimated 2017 Volumes Within Fort Belvoir - PM Alt1								
	Growth Factors Based on Peak Period Link Volumes					1/30/2014								
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
25	Mt Vernon Rd	Gillespie Rd	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		26	13	0	4	12	31	25	130	17	0	141	1
B	Sum of Approach Vol			39			47			172			142	
C	Dist of Approach Vol		67%	33%	0%	9%	26%	66%	15%	76%	10%	0%	99%	1%
D	Approach Growth Factor			-100%			0%			-23%			-56%	
E	New Approach Vol Sum = B x D			0			47			132			63	
F	Vol Based on Entry Dist. = C x E		0	0	0	4	12	31	19	100	13	0	63	0
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	13	17	25	12	1	26	130	31	4	141	0
H	Sum of Exit Vol			30			38			187			145	
J	Dist of Exit Vol		0%	43%	57%	66%	32%	3%	14%	70%	17%	3%	97%	0%
K	Exit Growth Factor			0%			-53%			-38%			-57%	
L	New Exit Vol Sum = H x K			30			18			115			62	
M	Vol Based on Exit Dist = J x L		0	13	17	12	6	0	16	80	19	2	60	0
N	Transpose Exit Vols (EBL...SBR)		16	13	0	2	6	19	12	80	17	0	60	0
O	Average Entry & Exit Vols = (F+N)/2		8	7	0	3	9	25	15	90	15	0	61	0
P	Revised Sum of Approach Vol			15			37			120			62	
R	Revised Dist of Approach Vol		55%	45%	0%	8%	24%	68%	13%	75%	12%	0%	99%	1%
	Rounded Volumes		**10**	**10**	**0**	**0**	**10**	**30**	**20**	**90**	**20**	**0**	**60**	**0**
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
26	Gunston Rd	3rd St	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		4	0	5	19	0	38	2	853	5	4	342	1
B	Sum of Approach Vol			9			57			860			347	
C	Dist of Approach Vol		0%	0%	0%	33%	0%	67%	0%	99%	1%	1%	99%	0%
D	Approach Growth Factor			0%			0%			75%			131%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			9			57			1501		**801**	**764**	**782**
F	Vol Based on Entry Dist. = C x E		0	0	0	19	0	38	3	1489	9	**9**	**771**	**2**
			Eastbound Exit Vols			Westbound Exit Vols			Northbound Exit Vols			Southbound Exit Vols		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		4	0	5	2	0	1	4	853	38	19	342	5
H	Sum of Exit Vol			9			3			895			366	
J	Dist of Exit Vol		44%	0%	56%	67%	0%	33%	0%	95%	4%	5%	93%	1%
K	Exit Growth Factor			0%			0%			78%			105%	
L	New Exit Vol Sum = H x K//H+abs//Avg (2)			9			3			1594		**751**	**755**	**753**
M	Vol Based on Exit Dist = J x L		4	0	5	2	0	1	7	1519	68	**39**	**703**	**10**
N	Transpose Exit Vols (EBL...SBR)		7	0	10	39	0	68	2	1519	5	4	703	1
O	Average Entry & Exit Vols = (F+N)/2		4	0	5	29	0	53	3	1504	7	7	737	2
P	Revised Sum of Approach Vol			9			82			1513			745	
R	Revised Dist of Approach Vol		41%	0%	59%	35%	0%	65%	0%	99%	0%	1%	99%	0%
	Rounded Volumes		**10**	**0**	**10**	**30**	**0**	**50**	**0**	**1500**	**10**	**10**	**750**	**0**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													
2	Volumes for southbound exit based on average of volumes from growth factor and absolute volume increase.													

FORT BELVOIR TMP TRAFFIC ANALYSIS					Estimated 2017 Volumes Within Fort Belvoir - PM Alt1									
	Growth Factors Based on Peak Period Link Volumes				1/30/2014									
		Rounding Rules:	"1 to 99 Rnd to 10x (up if >d3)			>100 Rnd to 25x (up if >25+10)					>100 Rnd to 25x (down if<25+11)			
	Actual values are displayed as whole numbers			Products are based on mutiplication of actual values										
Site	NS Street	EW Street	Eastbnd Apprch Vols			Westbnd Apprch Vols			Northbnd Apprch Vols			Southbnd Apprch Vols		
27	Gunston Rd	Jackson Loop S.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
A	Existing Volume		59	0	49	0	0	0	21	642	0	0	438	23
B	Sum of Approach Vol			108			0			663			461	
C	Dist of Approach Vol		55%	0%	45%	0%	0%	0%	3%	97%	0%	0%	95%	5%
D	Approach Growth Factor			0%			0%			71%			105%	
E	New Appch Vol Sum = B x D//B+abs//Avg (1)			108			0			1131		**946**	**850**	**898**
F	Vol Based on Entry Dist. = C x E		59	0	49	0	0	0	36	1095	0	**0**	**853**	**45**
			Eastbound Out			Westbound out			Northbound out			Southbound Out		
	Calculate Vols using Exit Growth Factors		SBL	EBT	NBR	NBL	WBT	SBR	EBL	NBT	WBR	WBL	SBT	EBR
G	Existing Exit Vol		0	0	0	21	0	23	59	642	0	0	438	49
H	Sum of Exit Vol			0			44			701			487	
J	Dist of Exit Vol		0%	0%	0%	48%	0%	52%	8%	92%	0%	0%	90%	10%
K	Exit Growth Factor			0%			0%			75%			82%	
L	New Exit Vol Sum = H x K			0			44			1223			885	
M	Vol Based on Exit Dist = J x L		0	0	0	21	0	23	103	1120	0	0	796	89
N	Transpose Exit Vols (EBL…SBR)		103	0	89	0	0	0	21	1120	0	0	796	23
O	Average Entry & Exit Vols = (F+N)/2		81	0	69	0	0	0	28	1108	0	0	825	34
P	Revised Sum of Approach Vol			150			0			1136			858	
R	Revised Dist of Approach Vol		54%	0%	46%	0%	0%	0%	3%	97%	0%	0%	96%	4%
	Rounded Volumes		**80**	**0**	**70**	**0**	**0**	**0**	**30**	**1100**	**0**	**0**	**825**	**40**
1	Entry volumes for southbound approach based on average of volumes from growth factor and absolute volume increase.													

Existing LOS – AM On Post

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Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	819	720	51	143	80
v/c Ratio	0.38	0.45	0.12	0.06	0.11
Control Delay	10.9	0.9	4.5	3.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	0.9	4.5	3.9	5.4
Queue Length 50th (ft)	133	0	6	9	0
Queue Length 95th (ft)	181	0	14	15	14
Internal Link Dist (ft)	496			698	342
Turn Bay Length (ft)		250	200		
Base Capacity (vph)	2128	1583	478	2418	722
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.38	0.45	0.11	0.06	0.11

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	819	720	51	143	52	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3539	1583	1770	3539	3316	
Flt Permitted	1.00	1.00	0.27	1.00	0.97	
Satd. Flow (perm)	3539	1583	505	3539	3316	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	819	720	51	143	52	28
RTOR Reduction (vph)	0	0	0	0	64	0
Lane Group Flow (vph)	819	720	51	143	16	0
Turn Type	NA	Free	pm+pt	NA	NA	
Protected Phases	2		1	6	3	
Permitted Phases		Free	6			
Actuated Green, G (s)	51.9	90.0	61.5	61.5	17.5	
Effective Green, g (s)	51.9	90.0	61.5	61.5	17.5	
Actuated g/C Ratio	0.58	1.00	0.68	0.68	0.19	
Clearance Time (s)	5.5		5.5	5.5	5.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2040	1583	402	2418	644	
v/s Ratio Prot	0.23		0.01	0.04	0.00	
v/s Ratio Perm		c0.45	0.08			
v/c Ratio	0.40	0.45	0.13	0.06	0.02	
Uniform Delay, d1	10.5	0.0	5.5	4.7	29.3	
Progression Factor	1.00	1.00	0.84	0.81	1.00	
Incremental Delay, d2	0.6	0.9	0.1	0.0	0.1	
Delay (s)	11.1	0.9	4.8	3.9	29.4	
Level of Service	B	A	A	A	C	
Approach Delay (s)	6.3			4.1	29.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	812	291	312	145	29	23
v/c Ratio	0.56	0.36	0.77	0.06	0.05	0.06
Control Delay	18.8	3.2	44.8	4.3	31.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	3.2	44.8	4.3	31.0	0.3
Queue Length 50th (ft)	116	0	165	11	7	0
Queue Length 95th (ft)	164	37	238	20	19	0
Internal Link Dist (ft)	698			585	318	
Turn Bay Length (ft)		350	350		150	150
Base Capacity (vph)	1447	819	521	2477	610	361
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.36	0.60	0.06	0.05	0.06

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	812	291	312	145	29	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	812	291	312	145	29	23
RTOR Reduction (vph)	0	172	0	0	0	19
Lane Group Flow (vph)	812	119	312	145	29	4
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	36.8	36.8	20.7	63.0	16.0	16.0
Effective Green, g (s)	36.8	36.8	20.7	63.0	16.0	16.0
Actuated g/C Ratio	0.41	0.41	0.23	0.70	0.18	0.18
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1447	647	407	2477	610	281
v/s Ratio Prot	c0.23		c0.18	0.04	c0.01	
v/s Ratio Perm		0.08				0.00
v/c Ratio	0.56	0.18	0.77	0.06	0.05	0.01
Uniform Delay, d1	20.4	17.0	32.4	4.2	30.7	30.5
Progression Factor	0.80	0.72	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.6	8.4	0.0	0.1	0.1
Delay (s)	17.8	12.8	40.8	4.3	30.8	30.6
Level of Service	B	B	D	A	C	C
Approach Delay (s)	16.5			29.2	30.7	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	662	59	150	115	7	46	534	337
v/c Ratio	0.31	0.82	0.66	0.17	0.22	0.01	0.05	0.73	0.35
Control Delay	49.9	40.5	75.7	27.9	2.9	9.6	5.5	25.4	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	40.5	75.7	27.9	2.9	9.6	5.5	25.4	8.3
Queue Length 50th (ft)	16	179	34	36	0	2	5	215	51
Queue Length 95th (ft)	44	#268	#97	62	18	8	20	#478	131
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	94	809	90	879	517	502	960	727	968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.82	0.66	0.17	0.22	0.01	0.05	0.73	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	509	153	59	150	115	7	19	27	534	108	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	1699		1770	1673	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.44	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3417		1770	3539	1583	824	1699		1354	1673	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	509	153	59	150	115	7	19	27	534	108	229
RTOR Reduction (vph)	0	31	0	0	0	88	0	12	0	0	76	0
Lane Group Flow (vph)	29	631	0	59	150	27	7	34	0	534	261	0
Turn Type	Prot	NA		Prot	NA	Prot	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6	6	3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.8	21.2		3.5	21.9	21.9	53.6	53.6		47.3	47.3	
Effective Green, g (s)	2.8	21.2		3.5	21.9	21.9	53.6	53.6		47.3	47.3	
Actuated g/C Ratio	0.03	0.22		0.04	0.23	0.23	0.57	0.57		0.50	0.50	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	52	764		65	817	365	473	960		675	834	
v/s Ratio Prot	0.02	c0.18		c0.03	0.04	0.02	0.00	c0.02			0.16	
v/s Ratio Perm							0.01			c0.39		
v/c Ratio	0.56	0.83		0.91	0.18	0.07	0.01	0.04		0.79	0.31	
Uniform Delay, d1	45.4	35.0		45.5	29.3	28.5	9.6	9.1		19.7	14.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.3	9.9		78.9	0.5	0.4	0.0	0.1		9.2	1.0	
Delay (s)	57.7	45.0		124.4	29.8	28.9	9.6	9.2		28.9	15.1	
Level of Service	E	D		F	C	C	A	A		C	B	
Approach Delay (s)		45.5			46.7			9.3			23.5	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	9	1067	11	17	389
v/c Ratio	0.01	0.69	0.02	0.01	0.38
Control Delay	11.9	2.8	8.5	8.3	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	2.8	8.5	8.3	9.7
Queue Length 50th (ft)	0	0	1	1	28
Queue Length 95th (ft)	5	23	10	6	54
Internal Link Dist (ft)	917			636	2135
Turn Bay Length (ft)		300	200		
Base Capacity (vph)	1707	1556	637	1819	1700
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.69	0.02	0.01	0.23

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	9	1067	11	17	373	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	3539	1583	1770	3539	3427	
Flt Permitted	1.00	1.00	0.61	1.00	0.95	
Satd. Flow (perm)	3539	1583	1141	3539	3427	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	1067	11	17	373	16
RTOR Reduction (vph)	0	328	0	0	110	0
Lane Group Flow (vph)	9	739	11	17	279	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	24.2	37.4	30.4	30.4	13.2	
Effective Green, g (s)	24.2	37.4	30.4	30.4	13.2	
Actuated g/C Ratio	0.44	0.68	0.56	0.56	0.24	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1568	1243	643	1970	828	
v/s Ratio Prot	0.00	c0.14	c0.00	0.00	0.08	
v/s Ratio Perm		0.32	0.01			
v/c Ratio	0.01	0.59	0.02	0.01	0.34	
Uniform Delay, d1	8.5	4.6	5.7	5.4	17.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.8	0.0	0.0	0.2	
Delay (s)	8.5	5.3	5.7	5.4	17.3	
Level of Service	A	A	A	A	B	
Approach Delay (s)	5.4			5.5	17.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	95	21	107	3	42	2	1	5	16
v/c Ratio	0.34	0.04	0.36	0.01	0.06	0.00	0.00	0.01	0.01
Control Delay	27.0	0.1	27.0	0.0	11.9	15.5	0.0	11.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	0.1	27.0	0.0	11.9	15.5	0.0	11.8	0.0
Queue Length 50th (ft)	32	0	36	0	8	0	0	1	0
Queue Length 95th (ft)	73	0	80	0	28	5	0	7	0
Internal Link Dist (ft)	468		451			306			
Turn Bay Length (ft)				180	180		180	180	180
Base Capacity (vph)	565	606	567	643	669	921	882	649	1159
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.03	0.19	0.00	0.06	0.00	0.00	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	89	21	1	106	3	42	2	1	5	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)		1857	1583		1862	1583	1770	1863	1583	1770		1583
Flt Permitted		1.00	1.00		1.00	1.00	0.72	1.00	1.00	0.76		1.00
Satd. Flow (perm)		1857	1583		1862	1583	1333	1863	1583	1409		1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	89	21	1	106	3	42	2	1	5	0	16
RTOR Reduction (vph)	0	0	16	0	0	3	0	0	1	0	0	10
Lane Group Flow (vph)	0	95	5	0	107	0	42	2	0	5	0	6
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	pm+pt	NA	Perm	pm+pt		Perm
Protected Phases	4	4	4 5	3	3	3 1	5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)		6.8	14.4		7.0	7.7	27.7	25.6	25.6	24.9		24.2
Effective Green, g (s)		6.8	14.4		7.0	7.7	27.7	25.6	25.6	24.9		24.2
Actuated g/C Ratio		0.11	0.23		0.11	0.12	0.45	0.41	0.41	0.40		0.39
Clearance Time (s)		5.5			5.5		5.5	5.5	5.5	5.5		5.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)		203	367		209	196	609	768	652	569		616
v/s Ratio Prot		c0.05	0.00		c0.06	0.00	c0.00	0.00		0.00		
v/s Ratio Perm							c0.03		0.00	0.00		0.00
v/c Ratio		0.47	0.01		0.51	0.00	0.07	0.00	0.00	0.01		0.01
Uniform Delay, d1		26.0	18.4		25.9	23.8	9.8	10.7	10.7	11.2		11.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		1.7	0.0		2.1	0.0	0.0	0.0	0.0	0.0		0.0
Delay (s)		27.7	18.4		28.1	23.8	9.8	10.7	10.7	11.2		11.6
Level of Service		C	B		C	C	A	B	B	B		B
Approach Delay (s)		26.0			27.9			9.9			11.5	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	106	54	29	393	37	954
v/c Ratio	0.04	0.39	0.12	0.06	0.20	0.05	0.45
Control Delay	15.3	21.9	0.6	5.7	9.0	5.5	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	21.9	0.6	5.7	9.0	5.5	9.6
Queue Length 50th (ft)	2	20	0	3	19	4	62
Queue Length 95th (ft)	14	68	0	12	75	14	212
Internal Link Dist (ft)	1063	844			730		672
Turn Bay Length (ft)			200	200		350	
Base Capacity (vph)	553	482	660	484	1929	683	2098
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.22	0.08	0.06	0.20	0.05	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	3	103	3	54	29	338	55	37	887	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1771			1776	1583	1770	3465		1770	3502	
Flt Permitted		0.85			0.72	1.00	0.26	1.00		0.50	1.00	
Satd. Flow (perm)		1539			1347	1583	489	3465		924	3502	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	3	103	3	54	29	338	55	37	887	67
RTOR Reduction (vph)	0	3	0	0	0	46	0	17	0	0	7	0
Lane Group Flow (vph)	0	10	0	0	106	8	29	376	0	37	947	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		7.8			7.8	7.8	26.3	25.2		28.7	26.4	
Effective Green, g (s)		7.8			7.8	7.8	26.3	25.2		28.7	26.4	
Actuated g/C Ratio		0.15			0.15	0.15	0.51	0.49		0.55	0.51	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		231			202	238	275	1685		549	1784	
v/s Ratio Prot							0.00	0.11		c0.00	c0.27	
v/s Ratio Perm		0.01			c0.08	0.01	0.05			0.03		
v/c Ratio		0.05			0.52	0.03	0.11	0.22		0.07	0.53	
Uniform Delay, d1		18.8			20.3	18.8	6.5	7.7		5.3	8.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			2.5	0.1	0.2	0.3		0.1	1.1	
Delay (s)		18.9			22.7	18.8	6.7	8.0		5.3	9.7	
Level of Service		B			C	B	A	A		A	A	
Approach Delay (s)		18.9			21.4			7.9			9.5	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	9	7	76	22	458	65	958
v/c Ratio	0.03	0.02	0.27	0.05	0.20	0.10	0.39
Control Delay	15.0	10.7	15.1	5.1	7.3	4.9	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	10.7	15.1	5.1	7.3	4.9	7.2
Queue Length 50th (ft)	2	0	12	2	21	6	56
Queue Length 95th (ft)	11	8	42	9	73	19	175
Internal Link Dist (ft)		768	686		522		730
Turn Bay Length (ft)	200			200		200	
Base Capacity (vph)	725	698	620	448	2366	660	2451
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.12	0.05	0.19	0.10	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1	6	56	2	18	22	402	56	65	940	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87			0.97		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1623			1739		1770	3474		1770	3529	
Flt Permitted	0.91	1.00			0.79		0.27	1.00		0.47	1.00	
Satd. Flow (perm)	1693	1623			1424		507	3474		879	3529	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	1	6	56	2	18	22	402	56	65	940	18
RTOR Reduction (vph)	0	5	0	0	16	0	0	15	0	0	2	0
Lane Group Flow (vph)	9	2	0	0	60	0	22	443	0	65	956	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.4	4.4			4.4		24.0	23.4		25.6	24.2	
Effective Green, g (s)	4.4	4.4			4.4		24.0	23.4		25.6	24.2	
Actuated g/C Ratio	0.10	0.10			0.10		0.53	0.51		0.56	0.53	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	163	156			137		282	1778		519	1868	
v/s Ratio Prot		0.00					0.00	0.13		c0.00	c0.27	
v/s Ratio Perm	0.01				c0.04		0.04			0.07		
v/c Ratio	0.06	0.01			0.44		0.08	0.25		0.13	0.51	
Uniform Delay, d1	18.8	18.7			19.5		5.3	6.2		4.6	6.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0			2.2		0.1	0.1		0.1	0.2	
Delay (s)	18.9	18.7			21.7		5.4	6.3		4.7	7.2	
Level of Service	B	B			C		A	A		A	A	
Approach Delay (s)		18.8			21.7			6.3			7.0	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	45.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	15	127	424	330	686
v/c Ratio	0.05	0.33	0.39	0.56	0.30
Control Delay	15.8	5.3	12.6	8.9	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	5.3	12.6	8.9	4.6
Queue Length 50th (ft)	3	0	38	31	33
Queue Length 95th (ft)	15	24	72	#71	63
Internal Link Dist (ft)	564		472		791
Turn Bay Length (ft)				200	
Base Capacity (vph)	755	766	1504	591	2641
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.17	0.28	0.56	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	15	127	401	23	330	686
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3510		1770	3539
Flt Permitted	0.95	1.00	1.00		0.34	1.00
Satd. Flow (perm)	1770	1583	3510		639	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	127	401	23	330	686
RTOR Reduction (vph)	0	112	8	0	0	0
Lane Group Flow (vph)	15	15	416	0	330	686
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	4.8	4.8	11.7		23.7	23.7
Effective Green, g (s)	4.8	4.8	11.7		23.7	23.7
Actuated g/C Ratio	0.12	0.12	0.30		0.60	0.60
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	215	192	1039		569	2123
v/s Ratio Prot	0.01	c0.01	0.12		c0.10	0.19
v/s Ratio Perm					c0.25	
v/c Ratio	0.07	0.08	0.40		0.58	0.32
Uniform Delay, d1	15.4	15.4	11.1		4.5	3.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.2	0.3		1.4	0.1
Delay (s)	15.5	15.6	11.4		5.9	4.0
Level of Service	B	B	B		A	A
Approach Delay (s)	15.6		11.4			4.6
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	39.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	8	103	562	52	79	488
v/c Ratio	0.03	0.30	0.50	0.05	0.16	0.19
Control Delay	19.4	4.8	11.1	0.1	4.1	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	4.8	11.1	0.1	4.1	3.5
Queue Length 50th (ft)	2	0	113	0	6	22
Queue Length 95th (ft)	11	20	213	0	17	40
Internal Link Dist (ft)	1291		1285			1496
Turn Bay Length (ft)					100	
Base Capacity (vph)	671	690	1079	978	487	2658
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.15	0.52	0.05	0.16	0.18

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	8	103	562	52	79	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.30	1.00
Satd. Flow (perm)	1770	1583	1863	1583	550	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	103	562	52	79	488
RTOR Reduction (vph)	0	93	0	25	0	0
Lane Group Flow (vph)	8	10	562	27	79	488
Turn Type	NA	Prot	NA	Perm	pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	4.5	4.5	24.7	24.7	32.4	32.4
Effective Green, g (s)	4.5	4.5	24.7	24.7	32.4	32.4
Actuated g/C Ratio	0.09	0.09	0.52	0.52	0.68	0.68
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	166	148	960	816	428	2393
v/s Ratio Prot	0.00	c0.01	c0.30		0.01	c0.14
v/s Ratio Perm				0.02	0.12	
v/c Ratio	0.05	0.07	0.59	0.03	0.18	0.20
Uniform Delay, d1	19.8	19.8	8.0	5.7	3.9	2.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.9	0.0	0.2	0.0
Delay (s)	19.9	20.0	9.0	5.7	4.1	3.0
Level of Service	B	B	A	A	A	A
Approach Delay (s)	20.0		8.7			3.1
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	312	310	231	83	60	164	36	129	41	159	278	43
v/c Ratio	0.72	0.70	0.30	0.33	0.19	0.32	0.09	0.22	0.05	0.30	0.47	0.07
Control Delay	28.4	32.1	3.3	19.3	24.0	4.7	12.0	19.7	0.1	14.4	22.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	32.1	3.3	19.3	24.0	4.7	12.0	19.7	0.1	14.4	22.4	0.2
Queue Length 50th (ft)	92	115	0	21	21	0	8	39	0	37	92	0
Queue Length 95th (ft)	#186	192	36	46	49	34	24	83	0	78	169	0
Internal Link Dist (ft)		676			1895			1533			1285	
Turn Bay Length (ft)	180			400		70	180		90			150
Base Capacity (vph)	434	576	761	248	472	517	423	588	804	525	596	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.54	0.30	0.33	0.13	0.32	0.09	0.22	0.05	0.30	0.47	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	312	310	231	83	60	164	36	129	41	159	278	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.43	1.00	1.00	0.57	1.00	1.00	0.51	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	800	1863	1583	1065	1863	1583	958	1863	1583	1238	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	312	310	231	83	60	164	36	129	41	159	278	43
RTOR Reduction (vph)	0	0	159	0	0	132	0	0	27	0	0	30
Lane Group Flow (vph)	312	310	72	83	60	32	36	129	14	159	278	13
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	24.8	16.3	20.7	11.2	8.2	12.9	24.6	20.2	23.2	25.2	20.5	20.5
Effective Green, g (s)	24.8	16.3	20.7	11.2	8.2	12.9	24.6	20.2	23.2	25.2	20.5	20.5
Actuated g/C Ratio	0.37	0.25	0.31	0.17	0.12	0.19	0.37	0.31	0.35	0.38	0.31	0.31
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	462	458	626	212	230	439	409	568	686	509	576	490
v/s Ratio Prot	c0.11	c0.17	0.01	0.02	0.03	0.01	0.01	0.07	0.00	c0.02	c0.15	
v/s Ratio Perm	0.14		0.04	0.05		0.02	0.03		0.01	0.10		0.01
v/c Ratio	0.68	0.68	0.12	0.39	0.26	0.07	0.09	0.23	0.02	0.31	0.48	0.03
Uniform Delay, d1	16.0	22.6	16.2	24.0	26.3	21.8	13.4	17.2	14.1	14.0	18.5	15.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	3.9	0.1	1.2	0.6	0.1	0.1	0.9	0.0	0.4	2.9	0.1
Delay (s)	19.9	26.5	16.3	25.2	26.9	21.8	13.5	18.1	14.1	14.3	21.4	16.0
Level of Service	B	C	B	C	C	C	B	B	B	B	C	B
Approach Delay (s)		21.3			23.7			16.5			18.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	77	4	81	97	413
v/c Ratio	0.41	0.28	0.01	0.06	0.10	0.30
Control Delay	23.9	14.9	3.5	3.2	3.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	14.9	3.5	3.2	3.7	4.1
Queue Length 50th (ft)	27	12	0	6	8	40
Queue Length 95th (ft)	62	41	3	20	25	90
Internal Link Dist (ft)	1109	935		718		1533
Turn Bay Length (ft)			100		410	
Base Capacity (vph)	537	581	724	1391	990	1383
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.01	0.06	0.10	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	44	20	3	33	41	4	74	7	97	355	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.93		1.00	0.99		1.00	0.98	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1780			1725		1770	1839		1770	1824	
Flt Permitted		0.89			0.99		0.52	1.00		0.70	1.00	
Satd. Flow (perm)		1611			1703		960	1839		1312	1824	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	38	44	20	3	33	41	4	74	7	97	355	58
RTOR Reduction (vph)	0	18	0	0	36	0	0	2	0	0	6	0
Lane Group Flow (vph)	0	85	0	0	41	0	4	79	0	97	407	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.5			7.5		43.5	43.5		43.5	43.5	
Effective Green, g (s)		7.5			7.5		43.5	43.5		43.5	43.5	
Actuated g/C Ratio		0.12			0.12		0.72	0.72		0.72	0.72	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		201			212		696	1333		951	1322	
v/s Ratio Prot								0.04			c0.22	
v/s Ratio Perm		c0.05			0.02		0.00			0.07		
v/c Ratio		0.42			0.19		0.01	0.06		0.10	0.31	
Uniform Delay, d1		24.2			23.5		2.3	2.4		2.4	2.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4			0.4		0.0	0.1		0.2	0.6	
Delay (s)		25.7			24.0		2.3	2.5		2.7	3.5	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		25.7			24.0			2.4			3.4	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	22	2	441	0	1	0	37	46	1	0	174	8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	22	2	441	0	1	0	37	46	1	0	174	8

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	465	1	83	1	182
Volume Left (vph)	22	0	37	0	0
Volume Right (vph)	441	0	0	1	8
Hadj (s)	-0.53	0.03	0.26	-0.67	0.01
Departure Headway (s)	4.1	5.2	6.0	5.1	5.2
Degree Utilization, x	0.53	0.00	0.14	0.00	0.26
Capacity (veh/h)	840	621	548	637	639
Control Delay (s)	11.6	8.2	8.8	6.9	10.0
Approach Delay (s)	11.6	8.2	8.8		10.0
Approach LOS	B	A	A		B

Intersection Summary			
Delay	10.9		
Level of Service	B		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	103	41	29	13	75	444
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	103	41	29	13	75	444

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	144	42	519
Volume Left (vph)	103	0	75
Volume Right (vph)	41	13	0
Hadj (s)	0.01	-0.15	0.06
Departure Headway (s)	5.2	4.7	4.4
Degree Utilization, x	0.21	0.06	0.64
Capacity (veh/h)	631	712	796
Control Delay (s)	9.6	8.0	14.8
Approach Delay (s)	9.6	8.0	14.8
Approach LOS	A	A	B

Intersection Summary			
Delay	13.4		
Level of Service	B		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay (sec/veh)	32.6
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	2	2
Conflicting Circle Lanes	2	2	2	2
Adjusted Approach Flow (vph)	138	5	307	982
Demand Flow Rate (pc/h)	141	5	313	1001
Vehicles Circulating (pc/h)	475	391	99	158
Vehicles Exiting (pc/h)	684	21	517	238
Follow-Up Headway (s)	3.186	3.186	3.186	3.186
Ped Vol. Crossing Leg (#/hr)	0	0	0	0
Ped Capacity Adjustment	1.000	1.000	1.000	1.000
Approach Delay (sec/veh)	6.4	4.3	4.8	45.1
Approach LOS	A	A	A	E

Lane	Left	Left	Left	Right	Left	Right
Designated moves	LTR	LTR	L	TR	L	TR
Assumed Moves	LTR	LTR	L	TR	L	TR
Right Turn Channelized						
Lane Utilization	1.000	1.000	0.492	0.508	0.005	0.995
Critical Headway (s)	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow Rate (pc/h)	141	5	154	159	5	996
Capacity, Entry Lane (pc/h)	810	859	1049	1054	1004	1012
Entry HV Adjustment Factor	0.978	0.996	0.981	0.982	1.000	0.981
Flow Rate, Entry (vph)	138	5	151	156	5	977
Capacity, Entry (vph)	793	856	1029	1035	1004	992
Volume to Capacity Ratio	0.174	0.006	0.147	0.151	0.005	0.985
Control Delay (sec/veh)	6.4	4.3	4.8	4.8	3.6	45.3
Level of Service	A	A	A	A	A	E
95th-Percentile Queue (veh)	1	0	1	1	0	18

Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	15	79	134	197	619
v/c Ratio	0.06	0.27	0.22	0.08	0.29
Control Delay	17.2	9.7	4.5	2.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	9.7	4.5	2.7	8.9
Queue Length 50th (ft)	4	3	11	5	57
Queue Length 95th (ft)	15	29	30	16	103
Internal Link Dist (ft)		834		757	1195
Turn Bay Length (ft)	200		200		
Base Capacity (vph)	655	644	616	2613	2130
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.12	0.22	0.08	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	13	66	0	0	0	134	145	52	0	528	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5					5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	
Frt	1.00	0.87					1.00	0.96			0.98	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1770	1629					1770	3399			3461	
Flt Permitted	0.95	1.00					0.34	1.00			1.00	
Satd. Flow (perm)	1770	1629					635	3399			3461	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	13	66	0	0	0	134	145	52	0	528	91
RTOR Reduction (vph)	0	61	0	0	0	0	0	16	0	0	18	0
Lane Group Flow (vph)	15	18	0	0	0	0	134	181	0	0	601	0
Turn Type	Split	NA					pm+pt	NA			NA	
Protected Phases	4	4					5	2			6	
Permitted Phases							2					
Actuated Green, G (s)	4.0	4.0					33.6	33.6			24.5	
Effective Green, g (s)	4.0	4.0					33.6	33.6			24.5	
Actuated g/C Ratio	0.08	0.08					0.69	0.69			0.50	
Clearance Time (s)	5.5	5.5					5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	145	134					523	2349			1744	
v/s Ratio Prot	0.01	c0.01					c0.02	0.05			c0.17	
v/s Ratio Perm							0.16					
v/c Ratio	0.10	0.14					0.26	0.08			0.34	
Uniform Delay, d1	20.6	20.7					2.9	2.4			7.2	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.5					0.3	0.1			0.5	
Delay (s)	21.0	21.2					3.1	2.5			7.8	
Level of Service	C	C					A	A			A	
Approach Delay (s)		21.1			0.0			2.8			7.8	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	39	28	34	272	18	530
v/c Ratio	0.48	0.14	0.21	0.05	0.11	0.02	0.23
Control Delay	42.9	16.9	35.4	5.2	7.5	5.2	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	16.9	35.4	5.2	7.5	5.2	8.2
Queue Length 50th (ft)	59	5	11	6	26	3	75
Queue Length 95th (ft)	108	33	38	16	62	10	111
Internal Link Dist (ft)		1256	713		1510		757
Turn Bay Length (ft)				150		250	
Base Capacity (vph)	223	521	275	643	2404	808	2260
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.07	0.10	0.05	0.11	0.02	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	10	29	7	10	11	34	268	4	18	409	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.89			0.95		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1655			1742		1770	3531		1770	3418	
Flt Permitted	0.58	1.00			0.90		0.44	1.00		0.58	1.00	
Satd. Flow (perm)	1085	1655			1591		811	3531		1088	3418	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	10	29	7	10	11	34	268	4	18	409	121
RTOR Reduction (vph)	0	24	0	0	11	0	0	1	0	0	20	0
Lane Group Flow (vph)	106	15	0	0	17	0	34	271	0	18	510	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.3	17.3			4.4		69.5	65.5		66.7	64.1	
Effective Green, g (s)	17.3	17.3			4.4		69.5	65.5		66.7	64.1	
Actuated g/C Ratio	0.17	0.17			0.04		0.68	0.64		0.65	0.63	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	280			68		590	2269		729	2150	
v/s Ratio Prot	c0.03	0.01					c0.00	0.08		0.00	c0.15	
v/s Ratio Perm	c0.04				0.01		0.04			0.02		
v/c Ratio	0.45	0.05			0.26		0.06	0.12		0.02	0.24	
Uniform Delay, d1	37.5	35.4			47.2		5.3	7.0		6.1	8.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1			2.0		0.0	0.1		0.0	0.3	
Delay (s)	38.9	35.5			49.2		5.3	7.2		6.2	8.5	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		38.0			49.2			6.9			8.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	200	243	152	76	264	138
v/c Ratio	0.50	0.31	0.24	0.06	0.40	0.21
Control Delay	21.6	2.5	7.2	6.1	16.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	2.5	7.2	6.1	16.4	3.5
Queue Length 50th (ft)	52	0	18	9	59	0
Queue Length 95th (ft)	100	27	49	27	128	26
Internal Link Dist (ft)	1895			1548	1510	
Turn Bay Length (ft)	180		100			
Base Capacity (vph)	614	798	640	1193	657	661
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.30	0.24	0.06	0.40	0.21

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	200	243	152	76	264	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.45	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	838	1863	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	243	152	76	264	138
RTOR Reduction (vph)	0	167	0	0	0	90
Lane Group Flow (vph)	200	76	152	76	264	48
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	8.9	15.3	28.8	28.8	16.9	16.9
Effective Green, g (s)	8.9	15.3	28.8	28.8	16.9	16.9
Actuated g/C Ratio	0.18	0.31	0.59	0.59	0.35	0.35
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	323	676	618	1101	646	549
v/s Ratio Prot	c0.11	0.01	c0.03	0.04	c0.14	
v/s Ratio Perm		0.03	0.11			0.03
v/c Ratio	0.62	0.11	0.25	0.07	0.41	0.09
Uniform Delay, d1	18.3	11.9	4.8	4.2	12.1	10.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	0.2	0.1	1.9	0.3
Delay (s)	21.9	11.9	5.0	4.4	14.0	11.0
Level of Service	C	B	A	A	B	B
Approach Delay (s)	16.4			4.8	13.0	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	1	85	0	0	0	29	170	5	1	367	59
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	1	85	0	0	0	29	170	5	1	367	59
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	626	632	396	685	658	172	426			175		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	626	632	396	685	658	172	426			175		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	87	100	100	100	97			100		
cM capacity (veh/h)	388	387	653	308	374	871	1133			1401		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	116	0	29	175	1	426
Volume Left	30	0	29	0	1	0
Volume Right	85	0	0	5	0	59
cSH	552	1700	1133	1700	1401	1700
Volume to Capacity	0.21	0.00	0.03	0.10	0.00	0.25
Queue Length 95th (ft)	20	0	2	0	0	0
Control Delay (s)	13.2	0.0	8.3	0.0	7.6	0.0
Lane LOS	B	A	A		A	
Approach Delay (s)	13.2	0.0	1.2		0.0	
Approach LOS	B	A				

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	16	16	2	85	58	68	7	88	17	51	57	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	16	2	85	58	68	7	88	17	51	57	29

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	34	211	112	137
Volume Left (vph)	16	85	7	51
Volume Right (vph)	2	68	17	29
Hadj (s)	0.09	-0.08	-0.04	-0.02
Departure Headway (s)	4.8	4.5	4.6	4.6
Degree Utilization, x	0.05	0.26	0.14	0.18
Capacity (veh/h)	683	761	734	732
Control Delay (s)	8.1	9.0	8.4	8.6
Approach Delay (s)	8.1	9.0	8.4	8.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay		8.7		
Level of Service		A		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	62	9	18	55	28	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	62	9	18	55	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	128	38	47			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	128	38	47			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	99	99			
cM capacity (veh/h)	856	1035	1560			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	71	73	47
Volume Left	62	18	0
Volume Right	9	0	19
cSH	875	1560	1700
Volume to Capacity	0.08	0.01	0.03
Queue Length 95th (ft)	7	1	0
Control Delay (s)	9.5	1.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	835	624	138	75
v/c Ratio	0.36	0.39	0.06	0.13
Control Delay	4.7	0.7	3.6	1.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.7	0.7	3.6	1.5
Queue Length 50th (ft)	42	0	5	0
Queue Length 95th (ft)	84	0	15	4
Internal Link Dist (ft)	412		676	814
Turn Bay Length (ft)		200		
Base Capacity (vph)	2310	1583	2199	1159
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.39	0.06	0.06

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	835	624	1	137	56	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	1.00		0.95	0.97	
Frt	1.00	0.85		1.00	0.96	
Flt Protected	1.00	1.00		1.00	0.96	
Satd. Flow (prot)	3539	1583		3538	3351	
Flt Permitted	1.00	1.00		0.95	0.96	
Satd. Flow (perm)	3539	1583		3368	3351	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	835	624	1	137	56	19
RTOR Reduction (vph)	0	136	0	0	65	0
Lane Group Flow (vph)	835	488	0	138	10	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	33.0	39.6		33.0	6.6	
Effective Green, g (s)	33.0	39.6		33.0	6.6	
Actuated g/C Ratio	0.65	0.78		0.65	0.13	
Clearance Time (s)	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2308	1583		2196	437	
v/s Ratio Prot	c0.24	c0.04			0.00	
v/s Ratio Perm		0.27		0.04		
v/c Ratio	0.36	0.31		0.06	0.02	
Uniform Delay, d1	4.0	1.6		3.2	19.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.0	0.0	
Delay (s)	4.4	1.7		3.2	19.2	
Level of Service	A	A		A	B	
Approach Delay (s)	3.3			3.2	19.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	35	8	21	17	17	4	42	6	78	445	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	35	8	21	17	17	4	42	6	78	445	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	684	665	453	684	667	42	461			48		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	684	665	453	684	667	42	461			48		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	90	99	93	95	98	100			95		
cM capacity (veh/h)	330	360	607	318	359	1029	1100			1559		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	45	55	46	6	539
Volume Left	2	21	4	0	78
Volume Right	8	17	0	6	16
cSH	387	423	1100	1700	1559
Volume to Capacity	0.12	0.13	0.00	0.00	0.05
Queue Length 95th (ft)	10	11	0	0	4
Control Delay (s)	15.5	14.8	0.7	0.0	1.5
Lane LOS	C	B	A		A
Approach Delay (s)	15.5	14.8	0.7		1.5
Approach LOS	C	B			

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	198	5	2	173	18	16	0	14	6	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	198	5	2	173	18	16	0	14	6	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	191			203			448	446	200	450	439	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	191			203			448	446	200	450	439	182
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	98	99	100	99
cM capacity (veh/h)	1383			1369			506	498	840	503	502	861

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	228	193	30	18
Volume Left	25	2	16	6
Volume Right	5	18	14	12
cSH	1383	1369	621	696
Volume to Capacity	0.02	0.00	0.05	0.03
Queue Length 95th (ft)	1	0	4	2
Control Delay (s)	1.0	0.1	11.1	10.3
Lane LOS	A	A	B	B
Approach Delay (s)	1.0	0.1	11.1	10.3
Approach LOS			B	B

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	53	19	1	141	358	61
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	53	19	1	141	358	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	532	388	419			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	532	388	419			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	97	100			
cM capacity (veh/h)	508	660	1140			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	142	419
Volume Left	53	1	0
Volume Right	19	0	61
cSH	541	1140	1700
Volume to Capacity	0.13	0.00	0.25
Queue Length 95th (ft)	11	0	0
Control Delay (s)	12.7	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	14	11	0	3	23	36	9	178	61	0	70	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	14	11	0	3	23	36	9	178	61	0	70	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	59			11			124	86	41	236	104	11
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			11			124	86	41	236	104	11
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	78	94	100	91	100
cM capacity (veh/h)	1545			1608			783	795	1030	555	777	1070

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	25	62	248	73
Volume Left	14	3	9	0
Volume Right	0	36	61	3
cSH	1545	1608	842	786
Volume to Capacity	0.01	0.00	0.29	0.09
Queue Length 95th (ft)	1	0	31	8
Control Delay (s)	4.1	0.4	11.1	10.0
Lane LOS	A	A	B	B
Approach Delay (s)	4.1	0.4	11.1	10.0
Approach LOS			B	B

Intersection Summary				
Average Delay	8.8			
Intersection Capacity Utilization	34.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	6	2	2	451	37	666
v/c Ratio	0.00	0.03	0.00	0.00	0.16	0.05	0.22
Control Delay	0.0	16.3	0.0	4.0	5.1	3.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	16.3	0.0	4.0	5.1	3.6	4.6
Queue Length 50th (ft)	0	1	0	0	0	0	0
Queue Length 95th (ft)	0	8	0	3	85	16	132
Internal Link Dist (ft)	374		682		991		472
Turn Bay Length (ft)				150		150	
Base Capacity (vph)	788	211	1071	654	2814	776	3075
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.03	0.00	0.00	0.16	0.05	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	0	1	6	0	2	2	415	36	37	663	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		5.5	5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695		1770	1583		1770	3497		1770	3537	
Flt Permitted		1.00		0.62	1.00		0.40	1.00		0.48	1.00	
Satd. Flow (perm)		1737		1164	1583		742	3497		894	3537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	1	6	0	2	2	415	36	37	663	3
RTOR Reduction (vph)	0	2	0	0	2	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	6	0	0	2	445	0	37	666	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		0.9		7.0	7.0		33.1	32.5		34.7	33.3	
Effective Green, g (s)		0.9		7.0	7.0		33.1	32.5		34.7	33.3	
Actuated g/C Ratio		0.02		0.12	0.12		0.58	0.57		0.60	0.58	
Clearance Time (s)		5.5		5.5	5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		27		148	193		438	1980		561	2051	
v/s Ratio Prot				c0.00	0.00		0.00	0.13		c0.00	c0.19	
v/s Ratio Perm		0.00		c0.00			0.00			0.04		
v/c Ratio		0.00		0.04	0.00		0.00	0.22		0.07	0.32	
Uniform Delay, d1		27.8		22.3	22.1		5.1	6.2		4.6	6.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0		0.1	0.0		0.0	0.3		0.0	0.4	
Delay (s)		27.8		22.4	22.1		5.2	6.5		4.6	6.7	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		27.8			22.3			6.4			6.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	36	16	52	491	568
v/c Ratio	0.14	0.04	0.08	0.16	0.21
Control Delay	17.4	0.2	3.3	2.6	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	0.2	3.3	2.6	5.8
Queue Length 50th (ft)	5	0	0	0	0
Queue Length 95th (ft)	27	0	14	43	85
Internal Link Dist (ft)	603			1496	991
Turn Bay Length (ft)			150		
Base Capacity (vph)	652	683	628	2976	2651
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.08	0.16	0.21

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	36	16	52	491	516	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3491	
Flt Permitted	0.95	1.00	0.37	1.00	1.00	
Satd. Flow (perm)	1770	1583	691	3539	3491	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	16	52	491	516	52
RTOR Reduction (vph)	0	15	0	0	9	0
Lane Group Flow (vph)	36	1	52	491	559	0
Turn Type	NA	custom	pm+pt	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	2.8	2.8	37.4	37.4	30.3	
Effective Green, g (s)	2.8	2.8	37.4	37.4	30.3	
Actuated g/C Ratio	0.05	0.05	0.73	0.73	0.59	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	96	86	538	2585	2065	
v/s Ratio Prot		0.00	0.00	c0.14	c0.16	
v/s Ratio Perm	c0.02		0.07			
v/c Ratio	0.38	0.01	0.10	0.19	0.27	
Uniform Delay, d1	23.4	22.9	2.2	2.2	5.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	0.0	0.1	0.2	0.3	
Delay (s)	25.8	22.9	2.3	2.3	5.4	
Level of Service	C	C	A	A	A	
Approach Delay (s)	24.9			2.3	5.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Existing LOS – PM On Post

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Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	227	70	85	974	604
v/c Ratio	0.12	0.04	0.12	0.41	0.75
Control Delay	12.0	0.1	5.2	6.4	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	0.1	5.2	6.4	33.4
Queue Length 50th (ft)	32	0	11	118	140
Queue Length 95th (ft)	62	0	38	154	181
Internal Link Dist (ft)	496			698	342
Turn Bay Length (ft)		250	200		
Base Capacity (vph)	1939	1583	749	2348	1257
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.04	0.11	0.41	0.48

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	227	70	85	974	555	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3539	1583	1770	3539	3413	
Flt Permitted	1.00	1.00	0.55	1.00	0.96	
Satd. Flow (perm)	3539	1583	1020	3539	3413	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	227	70	85	974	555	49
RTOR Reduction (vph)	0	0	0	0	76	0
Lane Group Flow (vph)	227	70	85	974	528	0
Turn Type	NA	Free	pm+pt	NA	NA	
Protected Phases	2		1	6	3	
Permitted Phases		Free	6			
Actuated Green, G (s)	48.2	90.0	59.7	59.7	19.3	
Effective Green, g (s)	48.2	90.0	59.7	59.7	19.3	
Actuated g/C Ratio	0.54	1.00	0.66	0.66	0.21	
Clearance Time (s)	5.5		5.5	5.5	5.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1895	1583	726	2347	731	
v/s Ratio Prot	0.06		0.01	c0.28	c0.15	
v/s Ratio Perm		0.04	0.07			
v/c Ratio	0.12	0.04	0.12	0.41	0.72	
Uniform Delay, d1	10.4	0.0	5.5	7.0	32.9	
Progression Factor	1.00	1.00	0.77	0.76	1.00	
Incremental Delay, d2	0.1	0.1	0.1	0.5	3.5	
Delay (s)	10.5	0.1	4.3	5.9	36.4	
Level of Service	B	A	A	A	D	
Approach Delay (s)	8.0			5.7	36.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	246	28	13	752	342	242
v/c Ratio	0.14	0.03	0.02	0.41	0.28	0.33
Control Delay	9.6	0.1	10.8	14.2	21.2	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	0.1	10.8	14.2	21.2	4.2
Queue Length 50th (ft)	25	0	3	131	70	0
Queue Length 95th (ft)	40	m0	12	173	103	47
Internal Link Dist (ft)	698			585	318	
Turn Bay Length (ft)		350	350		150	150
Base Capacity (vph)	1734	824	572	1828	1239	726
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.02	0.41	0.28	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	246	28	13	752	342	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.53	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	980	3539	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	246	28	13	752	342	242
RTOR Reduction (vph)	0	16	0	0	0	155
Lane Group Flow (vph)	246	12	13	752	342	87
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Actuated Green, G (s)	39.7	39.7	46.5	46.5	32.5	32.5
Effective Green, g (s)	39.7	39.7	46.5	46.5	32.5	32.5
Actuated g/C Ratio	0.44	0.44	0.52	0.52	0.36	0.36
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1561	698	517	1828	1239	571
v/s Ratio Prot	0.07		0.00	c0.21	c0.10	
v/s Ratio Perm		0.01	0.01			0.06
v/c Ratio	0.16	0.02	0.03	0.41	0.28	0.15
Uniform Delay, d1	15.1	14.2	10.8	13.3	20.4	19.4
Progression Factor	0.69	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.0	0.7	0.6	0.6
Delay (s)	10.7	14.2	10.8	14.0	21.0	20.0
Level of Service	B	B	B	B	C	C
Approach Delay (s)	11.1			14.0	20.6	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	195	316	10	581	555	134	118	234	43
v/c Ratio	0.75	0.20	0.10	0.66	0.58	0.69	0.16	0.84	0.11
Control Delay	51.5	15.6	38.6	32.8	4.1	54.4	9.6	55.4	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	15.6	38.6	32.8	4.1	54.4	9.6	55.4	12.2
Queue Length 50th (ft)	94	48	5	144	0	65	20	109	4
Queue Length 95th (ft)	#186	93	20	#207	56	#143	51	#220	29
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	276	1550	101	874	993	201	773	309	427
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.20	0.10	0.66	0.56	0.67	0.15	0.76	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	306	10	10	581	555	134	71	47	234	11	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3522		1770	3539	1583	1770	1751		1770	1655	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.68	1.00	
Satd. Flow (perm)	1770	3522		1770	3539	1583	1770	1751		1269	1655	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	195	306	10	10	581	555	134	71	47	234	11	32
RTOR Reduction (vph)	0	2	0	0	0	334	0	28	0	0	25	0
Lane Group Flow (vph)	195	314	0	10	581	221	134	90	0	234	18	0
Turn Type	Prot	NA		Prot	NA	custom	custom	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						8	3			4		
Actuated Green, G (s)	11.8	30.8		0.8	19.8	31.9	8.7	31.9		17.7	17.7	
Effective Green, g (s)	11.8	30.8		0.8	19.8	31.9	8.7	31.9		17.7	17.7	
Actuated g/C Ratio	0.15	0.39		0.01	0.25	0.40	0.11	0.40		0.22	0.22	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	261	1355		17	875	631	192	698		280	366	
v/s Ratio Prot	c0.11	0.09		0.01	c0.16		c0.08	0.05			0.01	
v/s Ratio Perm						0.14				c0.18		
v/c Ratio	0.75	0.23		0.59	0.66	0.35	0.70	0.13		0.84	0.05	
Uniform Delay, d1	32.7	16.6		39.4	27.1	16.8	34.4	15.2		29.8	24.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.1	0.4		42.8	4.0	0.3	10.5	0.1		18.9	0.1	
Delay (s)	43.7	17.0		82.2	31.1	17.1	44.9	15.3		48.7	24.6	
Level of Service	D	B		F	C	B	D	B		D	C	
Approach Delay (s)		27.2			24.8			31.1			45.0	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	15	523	6	26	1326
v/c Ratio	0.01	0.34	0.01	0.02	0.88
Control Delay	15.0	0.8	11.7	11.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	0.8	11.7	11.6	24.2
Queue Length 50th (ft)	1	0	1	3	214
Queue Length 95th (ft)	8	15	7	9	#344
Internal Link Dist (ft)	917			636	2135
Turn Bay Length (ft)		300	200		
Base Capacity (vph)	1359	1530	510	1463	1552
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.34	0.01	0.02	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	15	523	6	26	1318	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	3539	1583	1770	3539	3440	
Flt Permitted	1.00	1.00	0.61	1.00	0.95	
Satd. Flow (perm)	3539	1583	1137	3539	3440	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	523	6	26	1318	8
RTOR Reduction (vph)	0	132	0	0	82	0
Lane Group Flow (vph)	15	391	6	26	1244	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	24.6	51.2	30.9	30.9	26.6	
Effective Green, g (s)	24.6	51.2	30.9	30.9	26.6	
Actuated g/C Ratio	0.36	0.75	0.45	0.45	0.39	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1270	1310	520	1596	1335	
v/s Ratio Prot	0.00	c0.12	0.00	c0.01	c0.36	
v/s Ratio Perm		0.13	0.01			
v/c Ratio	0.01	0.30	0.01	0.02	0.93	
Uniform Delay, d1	14.1	2.8	10.6	10.4	20.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.0	0.0	11.8	
Delay (s)	14.1	2.9	10.6	10.4	31.9	
Level of Service	B	A	B	B	C	
Approach Delay (s)	3.3			10.4	31.9	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	243	47	83	14	29	2	1	17	1	10
v/c Ratio	0.60	0.07	0.32	0.04	0.05	0.00	0.00	0.03	0.00	0.02
Control Delay	30.6	0.2	31.2	0.2	14.0	19.5	0.0	14.0	21.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	0.2	31.2	0.2	14.0	19.5	0.0	14.0	21.0	0.0
Queue Length 50th (ft)	93	0	32	0	7	1	0	4	0	0
Queue Length 95th (ft)	169	1	74	0	24	6	0	17	4	0
Internal Link Dist (ft)	468		451			306			338	
Turn Bay Length (ft)				180	180		180	180		180
Base Capacity (vph)	594	685	514	371	558	679	694	541	619	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.07	0.16	0.04	0.05	0.00	0.00	0.03	0.00	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	232	47	1	82	14	29	2	1	17	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1859	1583		1862	1583	1770	1863	1583	1770	1863	1583
Flt Permitted		1.00	1.00		1.00	1.00	0.72	1.00	1.00	0.76	1.00	1.00
Satd. Flow (perm)		1859	1583		1862	1583	1348	1863	1583	1409	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	232	47	1	82	14	29	2	1	17	1	10
RTOR Reduction (vph)	0	0	36	0	0	12	0	0	1	0	0	7
Lane Group Flow (vph)	0	243	11	0	83	2	29	2	0	17	1	3
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2		2	6		6
Actuated Green, G (s)		13.5	15.8		6.7	8.0	24.8	22.5	22.5	22.8	21.5	21.5
Effective Green, g (s)		13.5	15.8		6.7	8.0	24.8	22.5	22.5	22.8	21.5	21.5
Actuated g/C Ratio		0.20	0.24		0.10	0.12	0.38	0.34	0.34	0.35	0.33	0.33
Clearance Time (s)		5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		380	510		189	191	521	635	539	493	606	515
v/s Ratio Prot		c0.13	0.00		c0.04	0.00	c0.00	0.00		0.00	0.00	
v/s Ratio Perm			0.01			0.00	c0.02		0.00	0.01		0.00
v/c Ratio		0.64	0.02		0.44	0.01	0.06	0.00	0.00	0.03	0.00	0.01
Uniform Delay, d1		24.0	19.2		27.9	25.5	13.1	14.4	14.3	14.3	15.0	15.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.5	0.0		1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay (s)		27.5	19.2		29.5	25.5	13.1	14.4	14.3	14.3	15.0	15.1
Level of Service		C	B		C	C	B	B	B	B	B	B
Approach Delay (s)		26.2			28.9			13.2			14.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	76	48	1	1223	44	344
v/c Ratio	0.08	0.28	0.11	0.00	0.53	0.10	0.14
Control Delay	16.2	20.2	0.6	5.0	12.8	5.0	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	20.2	0.6	5.0	12.8	5.0	6.4
Queue Length 50th (ft)	3	14	0	0	83	4	17
Queue Length 95th (ft)	20	52	0	2	#328	15	66
Internal Link Dist (ft)	1063	844			730		672
Turn Bay Length (ft)			150	150		350	
Base Capacity (vph)	508	535	682	781	2292	438	2480
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.14	0.07	0.00	0.53	0.10	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	2	5	76	0	48	1	1116	107	44	341	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1770	1583	1770	3493		1770	3535	
Flt Permitted		0.75			0.77	1.00	0.55	1.00		0.16	1.00	
Satd. Flow (perm)		1352			1433	1583	1015	3493		292	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	2	5	76	0	48	1	1116	107	44	341	3
RTOR Reduction (vph)	0	4	0	0	0	43	0	8	0	0	1	0
Lane Group Flow (vph)	0	18	0	0	76	5	1	1215	0	44	343	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		5.2			5.2	5.2	28.5	27.4		30.9	28.6	
Effective Green, g (s)		5.2			5.2	5.2	28.5	27.4		30.9	28.6	
Actuated g/C Ratio		0.10			0.10	0.10	0.55	0.53		0.60	0.56	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		136			144	160	578	1862		241	1966	
v/s Ratio Prot							0.00	c0.35		c0.01	0.10	
v/s Ratio Perm		0.01			c0.05	0.00	0.00			0.10		
v/c Ratio		0.13			0.53	0.03	0.00	0.65		0.18	0.17	
Uniform Delay, d1		21.0			21.9	20.8	5.1	8.6		5.1	5.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			3.5	0.1	0.0	1.8		0.4	0.2	
Delay (s)		21.5			25.4	20.9	5.1	10.4		5.4	5.8	
Level of Service		C			C	C	A	B		A	A	
Approach Delay (s)		21.5			23.7			10.4			5.8	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	14	9	99	3	1232	11	412
v/c Ratio	0.06	0.04	0.37	0.00	0.51	0.03	0.17
Control Delay	21.7	14.6	16.8	4.0	7.4	4.1	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	14.6	16.8	4.0	7.4	4.1	5.2
Queue Length 50th (ft)	4	0	12	0	84	1	21
Queue Length 95th (ft)	20	12	57	3	245	5	67
Internal Link Dist (ft)		768	686		522		730
Turn Bay Length (ft)	150			150		150	
Base Capacity (vph)	567	559	537	704	2670	340	2687
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.18	0.00	0.46	0.03	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	1	8	46	1	52	3	1166	66	11	410	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87			0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1614			1691		1770	3511		1770	3537	
Flt Permitted	0.89	1.00			0.85		0.51	1.00		0.18	1.00	
Satd. Flow (perm)	1652	1614			1466		951	3511		327	3537	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	1	8	46	1	52	3	1166	66	11	410	2
RTOR Reduction (vph)	0	7	0	0	46	0	0	5	0	0	0	0
Lane Group Flow (vph)	14	2	0	0	53	0	3	1227	0	11	412	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.2	6.2			6.2		34.0	33.4		34.0	33.4	
Effective Green, g (s)	6.2	6.2			6.2		34.0	33.4		34.0	33.4	
Actuated g/C Ratio	0.11	0.11			0.11		0.60	0.59		0.60	0.59	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	180	176			160		578	2068		211	2083	
v/s Ratio Prot		0.00					0.00	c0.35		c0.00	0.12	
v/s Ratio Perm	0.01				c0.04		0.00			0.03		
v/c Ratio	0.08	0.01			0.33		0.01	0.59		0.05	0.20	
Uniform Delay, d1	22.7	22.5			23.3		4.6	7.4		5.1	5.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0			1.2		0.0	0.5		0.1	0.0	
Delay (s)	22.9	22.5			24.5		4.6	7.8		5.2	5.5	
Level of Service	C	C			C		A	A		A	A	
Approach Delay (s)		22.7			24.5			7.8			5.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	9	387	904	148	336
v/c Ratio	0.02	0.74	0.65	0.49	0.18
Control Delay	16.4	19.1	16.0	12.2	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	19.1	16.0	12.2	6.4
Queue Length 50th (ft)	2	52	120	20	23
Queue Length 95th (ft)	11	139	192	48	46
Internal Link Dist (ft)	564		468		791
Turn Bay Length (ft)				150	
Base Capacity (vph)	612	682	1769	302	2403
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.57	0.51	0.49	0.14

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	9	387	889	15	148	336
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3530		1770	3539
Flt Permitted	0.95	1.00	1.00		0.18	1.00
Satd. Flow (perm)	1770	1583	3530		329	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	387	889	15	148	336
RTOR Reduction (vph)	0	159	2	0	0	0
Lane Group Flow (vph)	9	228	902	0	148	336
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	11.5	11.5	19.8		28.3	28.3
Effective Green, g (s)	11.5	11.5	19.8		28.3	28.3
Actuated g/C Ratio	0.23	0.23	0.39		0.56	0.56
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	400	358	1375		268	1971
v/s Ratio Prot	0.01	c0.14	c0.26		c0.03	0.09
v/s Ratio Perm					0.27	
v/c Ratio	0.02	0.64	0.66		0.55	0.17
Uniform Delay, d1	15.3	17.8	12.7		7.1	5.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	3.7	1.1		2.5	0.0
Delay (s)	15.3	21.4	13.8		9.5	5.5
Level of Service	B	C	B		A	A
Approach Delay (s)	21.3		13.8			6.8
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	18	124	508	125	469
v/c Ratio	0.06	0.33	0.33	0.21	0.20
Control Delay	17.2	6.1	12.1	4.8	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	6.1	12.1	4.8	4.1
Queue Length 50th (ft)	4	0	48	10	21
Queue Length 95th (ft)	18	28	93	28	42
Internal Link Dist (ft)	1291		1285		1507
Turn Bay Length (ft)				100	
Base Capacity (vph)	746	751	1766	746	2909
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.17	0.29	0.17	0.16

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	18	124	480	28	125	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3510		1770	3539
Flt Permitted	0.95	1.00	1.00		0.34	1.00
Satd. Flow (perm)	1770	1583	3510		640	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	18	124	480	28	125	469
RTOR Reduction (vph)	0	110	6	0	0	0
Lane Group Flow (vph)	18	14	502	0	125	469
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	4.8	4.8	15.6		26.4	26.4
Effective Green, g (s)	4.8	4.8	15.6		26.4	26.4
Actuated g/C Ratio	0.11	0.11	0.37		0.63	0.63
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	201	180	1297		542	2213
v/s Ratio Prot	c0.01	0.01	c0.14		0.03	c0.13
v/s Ratio Perm					0.12	
v/c Ratio	0.09	0.08	0.39		0.23	0.21
Uniform Delay, d1	16.7	16.7	9.8		3.6	3.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.2	0.2		0.2	0.0
Delay (s)	16.9	16.9	10.0		3.8	3.5
Level of Service	B	B	A		A	A
Approach Delay (s)	16.9		10.0			3.5
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	123	136	46	67	184	179	177	218	57	111	123	213
v/c Ratio	0.75	0.67	0.12	0.30	0.70	0.34	0.21	0.21	0.05	0.15	0.12	0.22
Control Delay	80.9	70.0	0.7	51.9	65.6	8.7	9.0	15.5	0.1	8.7	15.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.9	70.0	0.7	51.9	65.6	8.7	9.0	15.5	0.1	8.7	15.3	2.7
Queue Length 50th (ft)	96	106	0	49	144	10	48	84	0	29	47	0
Queue Length 95th (ft)	#188	181	0	94	223	65	90	151	0	59	89	39
Internal Link Dist (ft)		676			1895			1533			1285	
Turn Bay Length (ft)	180			400		70	180		90			150
Base Capacity (vph)	163	240	388	550	643	649	837	1034	1289	865	1010	955
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.57	0.12	0.12	0.29	0.28	0.21	0.21	0.04	0.13	0.12	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	136	46	67	184	179	177	218	57	111	123	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.63	1.00	1.00	0.67	1.00	1.00	0.66	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	1183	1863	1583	1248	1863	1583	1234	1863	1583	1150	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	136	46	67	184	179	177	218	57	111	123	213
RTOR Reduction (vph)	0	0	37	0	0	128	0	0	20	0	0	97
Lane Group Flow (vph)	123	136	9	67	184	51	177	218	37	111	123	116
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	13.6	13.6	23.6	17.5	17.5	25.9	79.0	69.0	80.2	75.8	67.4	67.4
Effective Green, g (s)	13.6	13.6	23.6	17.5	17.5	25.9	79.0	69.0	80.2	75.8	67.4	67.4
Actuated g/C Ratio	0.11	0.11	0.19	0.14	0.14	0.21	0.64	0.56	0.65	0.61	0.54	0.54
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	164	204	300	222	262	400	828	1035	1022	743	1011	859
v/s Ratio Prot	c0.04	0.07	0.00	0.03	c0.10	0.01	c0.02	0.12	0.00	0.01	0.07	
v/s Ratio Perm	0.04		0.00	0.02		0.02	c0.12		0.02	0.08		0.07
v/c Ratio	0.75	0.67	0.03	0.30	0.70	0.13	0.21	0.21	0.04	0.15	0.12	0.13
Uniform Delay, d1	53.2	53.1	41.0	48.4	50.9	40.0	9.2	13.9	8.0	10.1	13.9	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.4	8.0	0.0	0.8	8.2	0.1	0.1	0.5	0.0	0.1	0.2	0.3
Delay (s)	70.6	61.1	41.0	49.2	59.1	40.1	9.3	14.4	8.0	10.2	14.2	14.3
Level of Service	E	E	D	D	E	D	A	B	A	B	B	B
Approach Delay (s)		61.9			49.7			11.6			13.2	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	124.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	141	20	273	30	107
v/c Ratio	0.34	0.39	0.02	0.21	0.04	0.08
Control Delay	19.3	10.1	3.9	4.2	3.9	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	10.1	3.9	4.2	3.9	3.1
Queue Length 50th (ft)	19	9	2	23	2	6
Queue Length 95th (ft)	49	43	8	56	10	21
Internal Link Dist (ft)	1109	935		718		1533
Turn Bay Length (ft)			100		410	
Base Capacity (vph)	753	843	904	1309	776	1266
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.17	0.02	0.21	0.04	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	48	6	4	34	103	20	265	8	30	76	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.90		1.00	1.00		1.00	0.96	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1810			1677		1770	1855		1770	1782	
Flt Permitted		0.85			0.99		0.69	1.00		0.59	1.00	
Satd. Flow (perm)		1577			1660		1281	1855		1102	1782	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	48	6	4	34	103	20	265	8	30	76	31
RTOR Reduction (vph)	0	5	0	0	89	0	0	1	0	0	10	0
Lane Group Flow (vph)	0	84	0	0	52	0	20	272	0	30	97	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.7			6.7		32.5	32.5		32.5	32.5	
Effective Green, g (s)		6.7			6.7		32.5	32.5		32.5	32.5	
Actuated g/C Ratio		0.14			0.14		0.67	0.67		0.67	0.67	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		219			230		863	1250		743	1201	
v/s Ratio Prot								c0.15			0.05	
v/s Ratio Perm		c0.05			0.03		0.02			0.03		
v/c Ratio		0.38			0.23		0.02	0.22		0.04	0.08	
Uniform Delay, d1		18.9			18.4		2.6	3.0		2.6	2.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1			0.5		0.0	0.4		0.1	0.1	
Delay (s)		20.0			19.0		2.6	3.4		2.7	2.8	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		20.0			19.0			3.3			2.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	11	22	3	38	8	276	136	7	11	44	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	11	22	3	38	8	276	136	7	11	44	4

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	35	49	412	7	59
Volume Left (vph)	2	3	276	0	11
Volume Right (vph)	22	8	0	7	4
Hadj (s)	-0.33	-0.05	0.37	-0.67	0.03
Departure Headway (s)	4.9	5.1	5.1	4.1	4.8
Degree Utilization, x	0.05	0.07	0.59	0.01	0.08
Capacity (veh/h)	662	634	691	856	724
Control Delay (s)	8.1	8.5	14.0	5.9	8.2
Approach Delay (s)	8.1	8.5	13.9		8.2
Approach LOS	A	A	B		A

Intersection Summary				
Delay	12.5			
Level of Service	B			
Intersection Capacity Utilization	39.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	6	50	387	108	27	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	50	387	108	27	15

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	56	495	42
Volume Left (vph)	6	0	27
Volume Right (vph)	50	108	0
Hadj (s)	-0.48	-0.10	0.16
Departure Headway (s)	4.6	4.0	4.7
Degree Utilization, x	0.07	0.55	0.05
Capacity (veh/h)	705	891	736
Control Delay (s)	7.9	11.7	7.9
Approach Delay (s)	7.9	11.7	7.9
Approach LOS	A	B	A

Intersection Summary			
Delay	11.1		
Level of Service	B		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay (sec/veh)	11.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	2	2
Conflicting Circle Lanes	2	2	2	2
Adjusted Approach Flow (vph)	505	15	616	188
Demand Flow Rate (pc/h)	515	15	629	191
Vehicles Circulating (pc/h)	125	952	368	61
Vehicles Exiting (pc/h)	127	45	272	906
Follow-Up Headway (s)	3.186	3.186	3.186	3.186
Ped Vol. Crossing Leg (#/hr)	0	0	0	0
Ped Capacity Adjustment	1.000	1.000	1.000	1.000
Approach Delay (sec/veh)	9.5	6.5	14.4	4.9
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Right	Left	Right
Designated moves	LTR	LTR	L	TR	L	TR
Assumed Moves	LTR	LTR	L	TR	L	TR
Right Turn Channelized						
Lane Utilization	1.000	1.000	0.083	0.917	0.026	0.974
Critical Headway (s)	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow Rate (pc/h)	515	15	52	577	5	186
Capacity, Entry Lane (pc/h)	1035	580	857	873	1079	1083
Entry HV Adjustment Factor	0.980	0.999	0.981	0.980	1.000	0.983
Flow Rate, Entry (vph)	505	15	51	565	5	183
Capacity, Entry (vph)	1015	580	841	856	1079	1064
Volume to Capacity Ratio	0.497	0.026	0.061	0.661	0.005	0.172
Control Delay (sec/veh)	9.5	6.5	4.9	15.3	3.4	4.9
Level of Service	A	A	A	C	A	A
95th-Percentile Queue (veh)	3	0	0	5	0	1

Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	66	122	69	675	187
v/c Ratio	0.27	0.40	0.09	0.27	0.10
Control Delay	23.1	13.4	4.1	3.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	13.4	4.1	3.4	8.8
Queue Length 50th (ft)	20	12	6	28	16
Queue Length 95th (ft)	46	48	19	57	37
Internal Link Dist (ft)		834		757	1195
Turn Bay Length (ft)	150		200		
Base Capacity (vph)	531	559	780	2486	1956
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.22	0.09	0.27	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	41	81	0	0	0	69	493	182	3	177	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5					5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	
Frt	1.00	0.90					1.00	0.96			0.99	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1770	1677					1770	3396			3517	
Flt Permitted	0.95	1.00					0.53	1.00			0.95	
Satd. Flow (perm)	1770	1677					986	3396			3332	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	41	81	0	0	0	69	493	182	3	177	7
RTOR Reduction (vph)	0	71	0	0	0	0	0	44	0	0	3	0
Lane Group Flow (vph)	66	51	0	0	0	0	69	631	0	0	184	0
Turn Type	Split	NA					pm+pt	NA		Perm	NA	
Protected Phases	4	4					5	2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.6	6.6					37.4	37.4			27.8	
Effective Green, g (s)	6.6	6.6					37.4	37.4			27.8	
Actuated g/C Ratio	0.12	0.12					0.68	0.68			0.51	
Clearance Time (s)	5.5	5.5					5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	212	201					728	2309			1684	
v/s Ratio Prot	c0.04	0.03					0.01	c0.19				
v/s Ratio Perm							0.06				0.06	
v/c Ratio	0.31	0.25					0.09	0.27			0.11	
Uniform Delay, d1	22.1	22.0					3.2	3.5			7.1	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.8	0.7					0.1	0.3			0.1	
Delay (s)	23.0	22.6					3.3	3.8			7.2	
Level of Service	C	C					A	A			A	
Approach Delay (s)		22.7			0.0			3.7			7.2	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	171	39	17	57	459	12	311
v/c Ratio	0.75	0.14	0.13	0.07	0.18	0.02	0.15
Control Delay	57.1	19.5	34.9	5.0	6.4	5.3	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	19.5	34.9	5.0	6.4	5.3	5.5
Queue Length 50th (ft)	96	8	5	6	27	1	18
Queue Length 95th (ft)	161	35	28	25	106	8	49
Internal Link Dist (ft)		1256	713		1510		757
Turn Bay Length (ft)				150		250	
Base Capacity (vph)	230	577	284	764	2494	686	2122
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.07	0.06	0.07	0.18	0.02	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	16	23	3	7	7	57	450	9	12	180	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91			0.94		1.00	1.00		1.00	0.94	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1698			1744		1770	3529		1770	3316	
Flt Permitted	0.53	1.00			0.93		0.53	1.00		0.49	1.00	
Satd. Flow (perm)	991	1698			1634		980	3529		908	3316	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	16	23	3	7	7	57	450	9	12	180	131
RTOR Reduction (vph)	0	19	0	0	7	0	0	1	0	0	51	0
Lane Group Flow (vph)	171	20	0	0	10	0	57	458	0	12	260	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.7	17.7			2.7		72.1	66.5		63.5	62.2	
Effective Green, g (s)	17.7	17.7			2.7		72.1	66.5		63.5	62.2	
Actuated g/C Ratio	0.17	0.17			0.03		0.71	0.65		0.62	0.61	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	244	294			43		736	2300		576	2022	
v/s Ratio Prot	c0.07	0.01					c0.00	c0.13		0.00	0.08	
v/s Ratio Perm	c0.06				0.01		0.05			0.01		
v/c Ratio	0.70	0.07			0.24		0.08	0.20		0.02	0.13	
Uniform Delay, d1	38.7	35.3			48.6		4.6	7.1		7.3	8.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	0.1			2.8		0.0	0.2		0.0	0.1	
Delay (s)	47.4	35.3			51.5		4.7	7.3		7.3	8.6	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		45.2			51.5			7.0			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	163	182	235	266	70	121
v/c Ratio	0.46	0.23	0.35	0.25	0.11	0.19
Control Delay	21.6	2.4	7.4	6.5	13.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	2.4	7.4	6.5	13.1	2.7
Queue Length 50th (ft)	41	0	28	32	13	0
Queue Length 95th (ft)	84	24	67	75	39	19
Internal Link Dist (ft)	1895			1548	1510	
Turn Bay Length (ft)	180		100			
Base Capacity (vph)	581	784	672	1071	614	628
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.23	0.35	0.25	0.11	0.19

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	163	182	235	266	70	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.53	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	988	1863	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	163	182	235	266	70	121
RTOR Reduction (vph)	0	101	0	0	0	81
Lane Group Flow (vph)	163	81	235	266	70	40
Turn Type	NA	pt+ov	pm+pt	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases	4		2			6
Actuated Green, G (s)	9.7	21.7	28.1	28.1	16.1	16.1
Effective Green, g (s)	9.7	21.7	28.1	28.1	16.1	16.1
Actuated g/C Ratio	0.20	0.44	0.58	0.58	0.33	0.33
Clearance Time (s)	5.5		5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	351	703	673	1072	614	522
v/s Ratio Prot	c0.09	0.05	c0.05	0.14	0.04	
v/s Ratio Perm			c0.15			0.03
v/c Ratio	0.46	0.12	0.35	0.25	0.11	0.08
Uniform Delay, d1	17.3	7.9	5.4	5.1	11.4	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.1	0.3	0.6	0.4	0.3
Delay (s)	18.2	8.0	5.8	5.7	11.8	11.5
Level of Service	B	A	A	A	B	B
Approach Delay (s)	12.8			5.7	11.6	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	46	1	44	0	0	1	54	396	6	1	153	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	1	44	0	0	1	54	396	6	1	153	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	670	676	164	706	683	399	174			402		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	670	676	164	706	683	399	174			402		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	95	100	100	100	96			100		
cM capacity (veh/h)	359	361	881	322	357	651	1403			1157		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	91	1	54	402	1	174
Volume Left	46	0	54	0	1	0
Volume Right	44	1	0	6	0	21
cSH	503	651	1403	1700	1157	1700
Volume to Capacity	0.18	0.00	0.04	0.24	0.00	0.10
Queue Length 95th (ft)	16	0	3	0	0	0
Control Delay (s)	13.7	10.5	7.7	0.0	8.1	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	13.7	10.5	0.9		0.0	
Approach LOS	B	B				

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	36	41	3	5	29	56	5	92	81	69	51	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	36	41	3	5	29	56	5	92	81	69	51	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	80	90	178	140
Volume Left (vph)	36	5	5	69
Volume Right (vph)	3	56	81	20
Hadj (s)	0.10	-0.33	-0.23	0.05
Departure Headway (s)	4.8	4.4	4.2	4.6
Degree Utilization, x	0.11	0.11	0.21	0.18
Capacity (veh/h)	686	751	808	748
Control Delay (s)	8.4	7.9	8.4	8.5
Approach Delay (s)	8.4	7.9	8.4	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.3			
Level of Service	A			
Intersection Capacity Utilization	38.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	25	7	24	57	30	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	7	24	57	30	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	144	39	48			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	144	39	48			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	98			
cM capacity (veh/h)	835	1033	1559			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	32	81	48
Volume Left	25	24	0
Volume Right	7	0	18
cSH	872	1559	1700
Volume to Capacity	0.04	0.02	0.03
Queue Length 95th (ft)	3	1	0
Control Delay (s)	9.3	2.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	2.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	236	59	579	518
v/c Ratio	0.12	0.06	0.31	0.59
Control Delay	6.1	0.1	7.0	14.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.1	0.1	7.0	14.7
Queue Length 50th (ft)	14	0	40	47
Queue Length 95th (ft)	33	0	80	82
Internal Link Dist (ft)	412		676	814
Turn Bay Length (ft)				
Base Capacity (vph)	1942	934	1849	1668
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.06	0.31	0.31

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	236	59	6	573	475	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	1.00		0.95	0.97	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	1.00	1.00		1.00	0.96	
Satd. Flow (prot)	3539	1583		3537	3412	
Flt Permitted	1.00	1.00		0.95	0.96	
Satd. Flow (perm)	3539	1583		3370	3412	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	236	59	6	573	475	43
RTOR Reduction (vph)	0	27	0	0	113	0
Lane Group Flow (vph)	236	32	0	579	405	0
Turn Type	NA	Perm	pm+pt	NA	NA	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	26.6	26.6		26.6	10.8	
Effective Green, g (s)	26.6	26.6		26.6	10.8	
Actuated g/C Ratio	0.55	0.55		0.55	0.22	
Clearance Time (s)	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1944	869		1852	761	
v/s Ratio Prot	0.07				c0.12	
v/s Ratio Perm		0.02		c0.17		
v/c Ratio	0.12	0.04		0.31	0.53	
Uniform Delay, d1	5.3	5.0		5.9	16.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.7	
Delay (s)	5.4	5.1		6.0	17.3	
Level of Service	A	A		A	B	
Approach Delay (s)	5.3			6.0	17.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	27	6	16	6	84	4	279	69	10	22	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	27	6	16	6	84	4	279	69	10	22	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	418	400	24	350	333	279	26			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	418	400	24	350	333	279	26			348		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	95	99	97	99	89	100			99		
cM capacity (veh/h)	477	532	1052	573	581	760	1588			1211		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	43	106	283	69	36
Volume Left	10	16	4	0	10
Volume Right	6	84	0	69	4
cSH	556	712	1588	1700	1211
Volume to Capacity	0.08	0.15	0.00	0.04	0.01
Queue Length 95th (ft)	6	13	0	0	1
Control Delay (s)	12.0	10.9	0.1	0.0	2.3
Lane LOS	B	B	A		A
Approach Delay (s)	12.0	10.9	0.1		2.3
Approach LOS	B	B			

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	29.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	187	29	5	148	6	16	1	7	3	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	187	29	5	148	6	16	1	7	3	0	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	154			216			396	378	202	382	389	151
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154			216			396	378	202	382	389	151
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	99	100	98
cM capacity (veh/h)	1426			1354			548	550	839	567	542	895

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	222	159	24	24
Volume Left	6	5	16	3
Volume Right	29	6	7	21
cSH	1426	1354	610	835
Volume to Capacity	0.00	0.00	0.04	0.03
Queue Length 95th (ft)	0	0	3	2
Control Delay (s)	0.2	0.3	11.1	9.4
Lane LOS	A	A	B	A
Approach Delay (s)	0.2	0.3	11.1	9.4
Approach LOS			B	A

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	25.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	65	12	3	175	233	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	12	3	175	233	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	440	258	284			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	440	258	284			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	98	100			
cM capacity (veh/h)	573	780	1278			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	77	178	284
Volume Left	65	3	0
Volume Right	12	0	51
cSH	598	1278	1700
Volume to Capacity	0.13	0.00	0.17
Queue Length 95th (ft)	11	0	0
Control Delay (s)	11.9	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	26	13	0	4	12	31	25	130	17	0	141	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	13	0	4	12	31	25	130	17	0	141	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43			13			172	100	28	182	116	13
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43			13			172	100	28	182	116	13
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	83	98	100	81	100
cM capacity (veh/h)	1566			1606			668	774	1048	658	759	1067

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	39	47	172	142
Volume Left	26	4	25	0
Volume Right	0	31	17	1
cSH	1566	1606	777	761
Volume to Capacity	0.02	0.00	0.22	0.19
Queue Length 95th (ft)	1	0	21	17
Control Delay (s)	4.9	0.6	11.0	10.8
Lane LOS	A	A	B	B
Approach Delay (s)	4.9	0.6	11.0	10.8
Approach LOS			B	B

Intersection Summary				
Average Delay	9.1			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	9	19	38	2	858	4	343
v/c Ratio	0.03	0.12	0.11	0.00	0.29	0.01	0.11
Control Delay	0.2	27.1	0.7	3.5	4.2	3.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.2	27.1	0.7	3.5	4.2	3.5	3.7
Queue Length 50th (ft)	0	7	0	0	0	0	0
Queue Length 95th (ft)	0	24	0	2	166	3	62
Internal Link Dist (ft)	670		619		983		468
Turn Bay Length (ft)				150		150	
Base Capacity (vph)	569	152	755	868	3010	541	3013
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.05	0.00	0.29	0.01	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	0	5	19	0	38	2	853	5	4	342	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		5.5	5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.93		1.00	0.85		1.00	1.00		1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1686		1770	1583		1770	3536		1770	3538	
Flt Permitted		1.00		0.61	1.00		0.55	1.00		0.31	1.00	
Satd. Flow (perm)		1723		1135	1583		1016	3536		577	3538	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	0	5	19	0	38	2	853	5	4	342	1
RTOR Reduction (vph)	0	9	0	0	34	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	19	4	0	2	858	0	4	343	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		2.1		8.3	8.3		50.8	50.1		50.8	50.1	
Effective Green, g (s)		2.1		8.3	8.3		50.8	50.1		50.8	50.1	
Actuated g/C Ratio		0.03		0.11	0.11		0.67	0.66		0.67	0.66	
Clearance Time (s)		5.5		5.5	5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		47		130	173		689	2343		398	2344	
v/s Ratio Prot				c0.00	0.00		0.00	c0.24		c0.00	0.10	
v/s Ratio Perm		0.00		c0.01			0.00			0.01		
v/c Ratio		0.01		0.15	0.02		0.00	0.37		0.01	0.15	
Uniform Delay, d1		35.7		30.5	30.0		4.1	5.7		4.1	4.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0		0.5	0.1		0.0	0.4		0.0	0.1	
Delay (s)		35.8		31.0	30.1		4.1	6.1		4.1	4.9	
Level of Service		D		C	C		A	A		A	A	
Approach Delay (s)		35.8			30.4			6.1			4.9	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	75.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	59	49	21	642	461
v/c Ratio	0.22	0.13	0.03	0.24	0.18
Control Delay	19.0	0.7	4.2	3.8	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	0.7	4.2	3.8	5.5
Queue Length 50th (ft)	14	0	2	34	22
Queue Length 95th (ft)	38	0	8	62	74
Internal Link Dist (ft)	885			1507	983
Turn Bay Length (ft)			150		
Base Capacity (vph)	621	659	643	2676	2512
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.03	0.24	0.18

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	59	49	21	642	438	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3513	
Flt Permitted	0.95	1.00	0.41	1.00	1.00	
Satd. Flow (perm)	1770	1583	772	3539	3513	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	59	49	21	642	438	23
RTOR Reduction (vph)	0	45	0	0	4	0
Lane Group Flow (vph)	59	4	21	642	457	0
Turn Type	NA	custom	pm+pt	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	4.8	4.8	37.8	37.8	31.4	
Effective Green, g (s)	4.8	4.8	37.8	37.8	31.4	
Actuated g/C Ratio	0.09	0.09	0.71	0.71	0.59	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	158	141	561	2495	2057	
v/s Ratio Prot		0.00	0.00	c0.18	0.13	
v/s Ratio Perm	c0.03		0.03			
v/c Ratio	0.37	0.03	0.04	0.26	0.22	
Uniform Delay, d1	23.0	22.3	2.6	2.8	5.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.1	0.0	0.2	0.2	
Delay (s)	24.5	22.4	2.7	3.1	5.5	
Level of Service	C	C	A	A	A	
Approach Delay (s)	23.5			3.1	5.5	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Existing LOS – AM Public Roads

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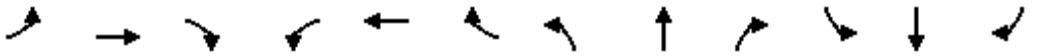
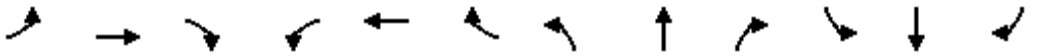
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	3587	17	42	937	122	30	5	177	76	3	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1577	1770	5085	1577	1770	1863	1583	1711	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.76	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1770	5085	1577	1770	5085	1577	1408	1863	1583	1359	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	3587	17	42	937	122	30	5	177	76	3	21
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	62	0	0	19
Lane Group Flow (vph)	57	3587	17	42	937	97	30	5	115	76	3	2
Bus Blockages (#/hr)	0	0	1	0	0	1	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4		4	8		8
Actuated Green, G (s)	13.9	235.4	235.4	11.1	232.6	232.6	26.4	26.4	26.4	26.4	26.4	26.4
Effective Green, g (s)	13.9	235.4	235.4	11.1	232.6	232.6	26.4	26.4	26.4	26.4	26.4	26.4
Actuated g/C Ratio	0.05	0.80	0.80	0.04	0.79	0.79	0.09	0.09	0.09	0.09	0.09	0.09
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	84	4073	1263	67	4024	1248	126	167	142	122	167	142
v/s Ratio Prot	c0.03	c0.71		0.02	0.18			0.00			0.00	
v/s Ratio Perm			0.01			0.06	0.02		c0.07	0.06		0.00
v/c Ratio	0.68	0.88	0.01	0.63	0.23	0.08	0.24	0.03	0.81	0.62	0.02	0.01
Uniform Delay, d1	137.8	19.8	5.9	139.4	7.8	6.8	124.4	122.1	131.3	129.0	121.9	121.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	2.6	0.0	12.4	0.0	0.0	1.0	0.1	28.3	9.5	0.0	0.0
Delay (s)	153.5	22.4	5.9	151.8	7.9	6.8	125.4	122.1	159.6	138.5	122.0	121.9
Level of Service	F	C	A	F	A	A	F	F	F	F	F	F
Approach Delay (s)		24.3			13.3			153.9			134.5	
Approach LOS		C			B			F			F	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	293.9	Sum of lost time (s)	21.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



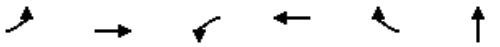
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1354	1	67	2	1	2	212	1078	1	1	599	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.5		7.5	7.5	7.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1685	1583	1770	1676		1770	3539		1770	3539	1583
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.19	1.00		0.17	1.00	1.00
Satd. Flow (perm)	1681	1685	1583	1770	1676		349	3539		310	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1354	1	67	2	1	2	212	1078	1	1	599	122
RTOR Reduction (vph)	0	0	26	0	2	0	0	0	0	0	0	35
Lane Group Flow (vph)	677	678	41	2	1	0	212	1079	0	1	599	87
Turn Type	Split	NA	pt+ov	Split	NA		pm+pt	NA		Perm	NA	pm+ov
Protected Phases	4	4	4 5	3	3		5	2			6	4
Permitted Phases							2			6		6
Actuated Green, G (s)	75.5	75.5	99.0	1.2	1.2		61.8	61.8		38.3	38.3	113.8
Effective Green, g (s)	75.5	75.5	99.0	1.2	1.2		61.8	61.8		38.3	38.3	113.8
Actuated g/C Ratio	0.47	0.47	0.62	0.01	0.01		0.39	0.39		0.24	0.24	0.71
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.5		7.5	7.5	7.0
Vehicle Extension (s)	5.0	5.0		2.0	2.0		4.0	4.0		4.0	4.0	5.0
Lane Grp Cap (vph)	793	795	979	13	13		281	1367		74	847	1126
v/s Ratio Prot	c0.40	0.40	0.03	c0.00	0.00		0.08	c0.30			0.17	0.04
v/s Ratio Perm							0.21			0.00		0.02
v/c Ratio	0.85	0.85	0.04	0.15	0.08		0.75	0.79		0.01	0.71	0.08
Uniform Delay, d1	37.4	37.3	11.9	78.9	78.9		37.0	43.4		46.4	55.7	7.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.13	0.90		0.94	1.01	1.23
Incremental Delay, d2	9.7	9.6	0.0	2.0	0.9		10.4	4.2		0.3	4.8	0.1
Delay (s)	47.1	47.0	12.0	80.9	79.8		52.1	43.1		44.0	61.3	8.7
Level of Service	D	D	B	F	E		D	D		D	E	A
Approach Delay (s)		45.4			80.2			44.6			52.4	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM Average Control Delay	46.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	109.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	11	204	3	1	6	48	2356	2	9	523	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1696	1583		1795	1583	1770	3539		1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.42	1.00		0.04	1.00	1.00
Satd. Flow (perm)	1681	1696	1583		1795	1583	786	3539		69	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	159	11	204	3	1	6	48	2356	2	9	523	268
RTOR Reduction (vph)	0	0	177	0	0	6	0	0	0	0	0	0
Lane Group Flow (vph)	84	86	27	0	4	0	48	2358	0	9	523	268
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt	NA		pm+pt	NA	Free
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2			6		Free
Actuated Green, G (s)	13.5	13.5	21.5		2.8	4.2	122.3	114.3		109.1	107.7	160.0
Effective Green, g (s)	13.5	13.5	21.5		2.8	4.2	122.3	114.3		109.1	107.7	160.0
Actuated g/C Ratio	0.08	0.08	0.13		0.02	0.03	0.76	0.71		0.68	0.67	1.00
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	143	282		31	42	650	2528		62	2382	1583
v/s Ratio Prot	0.05	c0.05	0.00		0.00	0.00	0.00	c0.67		0.00	0.15	
v/s Ratio Perm			0.01			0.00	0.05			0.10		c0.17
v/c Ratio	0.59	0.60	0.10		0.13	0.00	0.07	0.93		0.15	0.22	0.17
Uniform Delay, d1	70.6	70.7	60.7		77.4	75.9	4.8	19.6		32.9	10.0	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	2.06	1.00		0.53	0.28	1.00
Incremental Delay, d2	6.5	6.9	0.2		1.9	0.0	0.0	4.9		1.0	0.2	0.2
Delay (s)	77.0	77.6	60.9		79.3	75.9	10.0	24.5		18.5	3.1	0.2
Level of Service	E	E	E		E	E	A	C		B	A	A
Approach Delay (s)		68.4			77.3			24.3			2.3	
Approach LOS		E			E			C			A	

Intersection Summary			
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT
Lane Group Flow (vph)	234	2594	3	1398	123	189
v/c Ratio	0.63	0.74	0.04	0.68	0.17	0.61
Control Delay	45.4	11.3	22.7	26.4	4.6	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	11.3	22.7	26.4	4.6	34.9
Queue Length 50th (ft)	127	315	1	246	0	65
Queue Length 95th (ft)	261	478	8	391	37	170
Internal Link Dist (ft)		837		1008		920
Turn Bay Length (ft)	640		425		600	
Base Capacity (vph)	718	5085	176	4754	1488	564
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.51	0.02	0.29	0.08	0.34

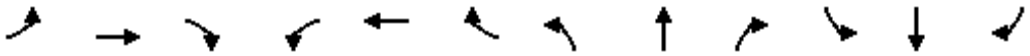
Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	234	2594	0	3	0	1398	123	64	0	125	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	8.0			8.0	8.0	8.0		7.0			
Lane Util. Factor	1.00	0.91			1.00	0.91	1.00		1.00			
Frt	1.00	1.00			1.00	1.00	0.85		0.91			
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98			
Satd. Flow (prot)	1770	5085			1770	5085	1583		1668			
Flt Permitted	0.95	1.00			0.10	1.00	1.00		0.98			
Satd. Flow (perm)	1770	5085			188	5085	1583		1668			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	234	2594	0	3	0	1398	123	64	0	125	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	73	0	59	0	0	0
Lane Group Flow (vph)	234	2594	0	0	3	1398	50	0	130	0	0	0
Turn Type	Prot	NA		Perm	Perm	NA	Perm	Perm	NA			
Protected Phases	5	2				6			7			
Permitted Phases				6	6		6	7				
Actuated Green, G (s)	20.3	67.0			39.7	39.7	39.7		14.7			
Effective Green, g (s)	20.3	67.0			39.7	39.7	39.7		14.7			
Actuated g/C Ratio	0.21	0.69			0.41	0.41	0.41		0.15			
Clearance Time (s)	7.0	8.0			8.0	8.0	8.0		7.0			
Vehicle Extension (s)	4.0	3.0			3.0	3.0	3.0		4.0			
Lane Grp Cap (vph)	371	3523			77	2087	649		253			
v/s Ratio Prot	0.13	c0.51				0.27						
v/s Ratio Perm					0.02		0.03		0.08			
v/c Ratio	0.63	0.74			0.04	0.67	0.08		0.51			
Uniform Delay, d1	34.8	9.3			17.1	23.2	17.4		37.7			
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	3.9	0.8			0.2	0.8	0.1		2.3			
Delay (s)	38.7	10.1			17.3	24.0	17.4		40.0			
Level of Service	D	B			B	C	B		D			
Approach Delay (s)		12.5				23.5			40.0			0.0
Approach LOS		B				C			D			A

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	96.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

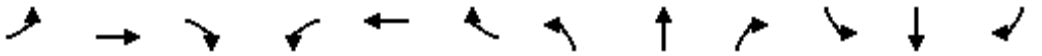
Movement	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



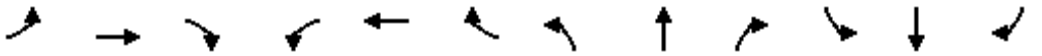
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	492	0	690	0	0	0	0	235	149	149	515	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Lane Util. Factor	0.95	0.95	1.00					0.86	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					6408	1583	3433	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					6408	1583	3433	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	492	0	690	0	0	0	0	235	149	149	515	0
RTOR Reduction (vph)	0	0	376	0	0	0	0	0	120	0	0	0
Lane Group Flow (vph)	246	246	314	0	0	0	0	235	29	149	515	0
Turn Type	Split	NA	Perm					NA	Perm	Split	NA	
Protected Phases	2	2						1		6 8	6 8	
Permitted Phases			2						1			
Actuated Green, G (s)	35.3	35.3	35.3					24.2	24.2	42.5	42.5	
Effective Green, g (s)	35.3	35.3	35.3					24.2	24.2	42.5	42.5	
Actuated g/C Ratio	0.29	0.29	0.29					0.20	0.20	0.35	0.35	
Clearance Time (s)	7.0	7.0	7.0					7.0	7.0			
Vehicle Extension (s)	3.0	3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)	482	482	454					1261	311	1186	1223	
v/s Ratio Prot	0.15	0.15						c0.04		0.04	c0.15	
v/s Ratio Perm			c0.20						0.02			
v/c Ratio	0.51	0.51	0.69					0.19	0.09	0.13	0.42	
Uniform Delay, d1	36.6	36.6	39.0					41.2	40.4	27.5	30.8	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.09	0.09	
Incremental Delay, d2	0.9	0.9	4.5					0.1	0.2	0.0	0.2	
Delay (s)	37.5	37.5	43.5					41.3	40.6	2.6	2.9	
Level of Service	D	D	D					D	D	A	A	
Approach Delay (s)		41.0			0.0			41.0			2.8	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	1	725	99	627	0	0	919	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	4.0	7.0	7.0			7.0	7.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.86	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1689	1583	3433	3539			6408	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1689	1583	3433	3539			6408	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	42	1	725	99	627	0	0	919	162
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	91
Lane Group Flow (vph)	0	0	0	21	22	725	99	627	0	0	919	71
Turn Type				Split	NA	Free	Split	NA			NA	Perm
Protected Phases				8	8		1 2	1 2			6	
Permitted Phases						Free						6
Actuated Green, G (s)				6.1	6.1	123.0	66.5	66.5			29.4	29.4
Effective Green, g (s)				6.1	6.1	123.0	66.5	66.5			29.4	29.4
Actuated g/C Ratio				0.05	0.05	1.00	0.54	0.54			0.24	0.24
Clearance Time (s)				7.0	7.0						7.0	7.0
Vehicle Extension (s)				3.0	3.0						3.0	3.0
Lane Grp Cap (vph)				83	84	1583	1856	1913			1532	378
v/s Ratio Prot				0.01	0.01		0.03	0.18			c0.14	
v/s Ratio Perm						c0.46						0.04
v/c Ratio				0.25	0.26	0.46	0.05	0.33			0.60	0.19
Uniform Delay, d1				56.3	56.3	0.0	13.4	15.8			41.6	37.3
Progression Factor				1.00	1.00	1.00	0.17	0.19			1.00	1.00
Incremental Delay, d2				1.6	1.7	1.0	0.0	0.1			0.6	0.2
Delay (s)				57.9	57.9	1.0	2.3	3.2			42.2	37.5
Level of Service				E	E	A	A	A			D	D
Approach Delay (s)		0.0			4.1			3.1			41.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	556	925	485	84	990	173	751	554	81	102	278	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3416	3522	1575	1770	3539	1577	3614	3539	1577	3433	3539	1577
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3416	3522	1575	1770	3539	1577	3614	3539	1577	3433	3539	1577
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	556	925	485	84	990	173	751	554	81	102	278	244
RTOR Reduction (vph)	0	0	233	0	0	82	0	0	62	0	0	223
Lane Group Flow (vph)	556	925	252	84	990	91	751	554	19	102	278	21
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	1	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	29.2	70.0	70.0	13.0	53.8	53.8	34.0	37.8	37.8	10.2	14.0	14.0
Effective Green, g (s)	29.2	70.0	70.0	13.0	53.8	53.8	34.0	37.8	37.8	10.2	14.0	14.0
Actuated g/C Ratio	0.18	0.44	0.44	0.08	0.34	0.34	0.21	0.24	0.24	0.06	0.09	0.09
Clearance Time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	4.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	623	1541	689	144	1190	530	768	836	373	219	310	138
v/s Ratio Prot	c0.16	0.26		0.05	c0.28		c0.21	0.16		0.03	c0.08	
v/s Ratio Perm			0.16			0.06			0.01			0.01
v/c Ratio	0.89	0.60	0.37	0.58	0.83	0.17	0.98	0.66	0.05	0.47	0.90	0.15
Uniform Delay, d1	63.9	34.3	30.1	70.9	48.9	37.4	62.6	55.3	47.2	72.3	72.3	67.5
Progression Factor	1.00	1.00	1.00	1.29	0.67	0.58	1.04	0.81	1.65	1.00	1.05	2.02
Incremental Delay, d2	15.4	1.7	1.5	5.0	5.9	0.6	18.9	1.1	0.0	1.5	25.8	0.5
Delay (s)	79.3	36.1	31.6	96.8	38.8	22.2	83.9	45.9	77.9	73.9	101.7	136.6
Level of Service	E	D	C	F	D	C	F	D	E	E	F	F
Approach Delay (s)		47.2			40.4			68.3			110.8	
Approach LOS		D			D			E			F	

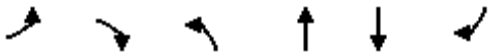
Intersection Summary			
HCM Average Control Delay	58.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	554	1	381	1	0	1	0	595	4	1	98	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	0.95	1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.85	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1506	1504	1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.34	1.00	
Satd. Flow (perm)	3433	1506	1504	1770		1583		3539	1583	626	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	554	1	381	1	0	1	0	595	4	1	98	0
RTOR Reduction (vph)	0	151	150	0	0	1	0	0	2	0	0	0
Lane Group Flow (vph)	554	41	40	1	0	0	0	595	2	1	98	0
Turn Type	Split	NA	Prot	Prot		custom		NA	Perm	pm+pt	NA	
Protected Phases	4	4	4	3		3 5		6		5	2	
Permitted Phases									6	2		
Actuated Green, G (s)	27.3	27.3	27.3	6.6		8.0		66.7	66.7	63.9	63.9	
Effective Green, g (s)	27.3	27.3	27.3	6.6		8.0		66.7	66.7	63.9	63.9	
Actuated g/C Ratio	0.21	0.21	0.21	0.05		0.06		0.51	0.51	0.49	0.49	
Clearance Time (s)	7.0	7.0	7.0	7.0				7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	721	316	316	90		97		1816	812	320	1740	
v/s Ratio Prot	c0.16	0.03	0.03	c0.00		0.00		c0.17		0.00	c0.03	
v/s Ratio Perm									0.00	0.00		
v/c Ratio	0.77	0.13	0.13	0.01		0.00		0.33	0.00	0.00	0.06	
Uniform Delay, d1	48.4	41.7	41.7	58.6		57.2		18.5	15.4	17.5	17.3	
Progression Factor	1.00	1.00	1.00	1.00		1.00		0.11	0.01	1.00	1.00	
Incremental Delay, d2	4.9	0.2	0.2	0.0		0.0		0.5	0.0	0.0	0.1	
Delay (s)	53.3	41.9	41.9	58.7		57.3		2.5	0.2	17.5	17.3	
Level of Service	D	D	D	E		E		A	A	B	B	
Approach Delay (s)		48.6			58.0			2.5			17.3	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	96	257	768	0	0	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.91
Frt	0.90		1.00			1.00
Flt Protected	0.99		1.00			1.00
Satd. Flow (prot)	1657		3539			5085
Flt Permitted	0.99		1.00			1.00
Satd. Flow (perm)	1657		3539			5085
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	257	768	0	0	38
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	353	0	768	0	0	38
Turn Type	NA		NA			NA
Protected Phases	4		6			2
Permitted Phases						
Actuated Green, G (s)	15.6		35.4			35.4
Effective Green, g (s)	15.6		35.4			35.4
Actuated g/C Ratio	0.24		0.54			0.54
Clearance Time (s)	7.0		7.0			7.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	398		1927			2769
v/s Ratio Prot	c0.21		c0.22			0.01
v/s Ratio Perm						
v/c Ratio	0.89		0.40			0.01
Uniform Delay, d1	23.8		8.6			6.8
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	20.4		0.6			0.0
Delay (s)	44.3		9.2			6.8
Level of Service	D		A			A
Approach Delay (s)	44.3		9.2			6.8
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	49	24	197	1211	378	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0	6.5	6.5	7.0
Lane Util. Factor	0.97		1.00	0.95	0.95	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3324		1770	3539	3539	1583
Flt Permitted	0.97		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3324		1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	24	197	1211	378	298
RTOR Reduction (vph)	22	0	0	0	0	126
Lane Group Flow (vph)	51	0	197	1211	378	172
Turn Type	NA		Prot	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases						6
Actuated Green, G (s)	6.8		13.4	59.7	39.3	46.1
Effective Green, g (s)	6.8		13.4	59.7	39.3	46.1
Actuated g/C Ratio	0.08		0.17	0.75	0.49	0.58
Clearance Time (s)	7.0		7.0	6.5	6.5	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283		296	2641	1739	912
v/s Ratio Prot	0.02		c0.11	c0.34	0.11	c0.02
v/s Ratio Perm						0.09
v/c Ratio	0.18		0.67	0.46	0.22	0.19
Uniform Delay, d1	34.0		31.2	3.9	11.6	8.1
Progression Factor	1.00		1.00	1.00	0.95	12.52
Incremental Delay, d2	0.3		5.6	0.6	0.3	0.1
Delay (s)	34.3		36.8	4.5	11.3	101.0
Level of Service	C		D	A	B	F
Approach Delay (s)	34.3			9.0	50.8	
Approach LOS	C			A	D	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

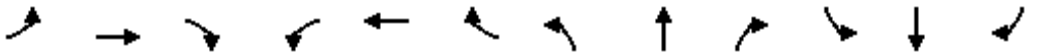
Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	382	196	683	1789	194	1796	546
v/c Ratio	0.86	0.25	0.81	0.58	0.79	0.79	0.80	0.34
Control Delay	122.6	0.4	115.4	14.7	51.7	108.8	32.3	0.6
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	122.6	0.4	115.4	14.9	51.7	108.8	32.3	0.6
Queue Length 50th (ft)	255	0	254	97	787	264	985	0
Queue Length 95th (ft)	#387	0	356	154	916	352	1095	0
Internal Link Dist (ft)	610				1235		338	
Turn Bay Length (ft)		270		365		390		
Base Capacity (vph)	231	1530	268	1155	2274	328	2258	1584
Starvation Cap Reductn	0	0	0	70	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.25	0.73	0.63	0.79	0.59	0.80	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	186	382	196	0	683	0	1570	219	194	1796	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			3%			1%			-4%	
Total Lost time (s)		7.0	4.0	7.0		7.0		7.0		7.0	7.0	4.0
Lane Util. Factor		1.00	1.00	1.00		0.88		0.91		1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85		0.98		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)		1800	1530	1710		2692		4871		1770	3541	1584
Flt Permitted		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)		1800	1530	1710		2692		4871		1770	3541	1584
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	186	382	196	0	683	0	1570	219	194	1796	546
RTOR Reduction (vph)	0	0	0	0	0	327	0	7	0	0	0	0
Lane Group Flow (vph)	0	186	382	196	0	356	0	1782	0	194	1796	546
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Free	Prot		custom		NA		Prot	NA	Free
Protected Phases		3		4		4 1		2		1	6	
Permitted Phases			Free									Free
Actuated Green, G (s)		25.3	210.0	29.8		66.0		97.7		29.2	133.9	210.0
Effective Green, g (s)		25.3	210.0	29.8		66.0		97.7		29.2	133.9	210.0
Actuated g/C Ratio		0.12	1.00	0.14		0.31		0.47		0.14	0.64	1.00
Clearance Time (s)		7.0		7.0				7.0		7.0	7.0	
Vehicle Extension (s)		4.0		4.0				5.0		4.0	5.0	
Lane Grp Cap (vph)		216	1530	242		846		2266		246	2257	1584
v/s Ratio Prot		c0.10		c0.11		0.13		0.37		0.11	c0.51	
v/s Ratio Perm			0.25									0.34
v/c Ratio		0.86	0.25	0.81		0.42		0.79		0.79	0.80	0.34
Uniform Delay, d1		90.6	0.0	87.4		56.9		47.3		87.4	28.0	0.0
Progression Factor		1.00	1.00	1.04		0.80		1.00		1.00	1.00	1.00
Incremental Delay, d2		28.5	0.4	18.7		0.5		2.8		16.1	3.0	0.6
Delay (s)		119.1	0.4	109.7		45.8		50.2		103.6	31.0	0.6
Level of Service		F	A	F		D		D		F	C	A
Approach Delay (s)		39.3			60.1			50.2			30.0	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	41.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	210.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



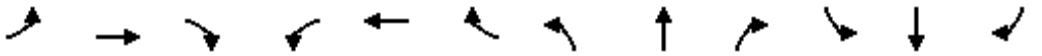
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	4	23	8	7	38	62	1326	14	63	2606	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1737	1516	1752	3505	1562	1752	3774	1237
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.03	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1737	1516	57	3505	1562	283	3774	1237
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	114	4	23	8	7	38	62	1326	14	63	2606	307
RTOR Reduction (vph)	0	0	21	0	0	37	0	0	5	0	0	45
Lane Group Flow (vph)	114	4	2	0	15	1	62	1326	9	63	2606	262
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	30%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	20.5	20.5	20.5		5.2	5.2	133.6	128.4	128.4	138.0	130.6	130.6
Effective Green, g (s)	20.5	20.5	20.5		5.2	5.2	133.6	128.4	128.4	138.0	130.6	130.6
Actuated g/C Ratio	0.11	0.11	0.11		0.03	0.03	0.70	0.68	0.68	0.73	0.69	0.69
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	175	195	163		48	41	86	2369	1056	263	2594	850
v/s Ratio Prot	c0.07	0.00			c0.01		c0.02	0.38		0.01	c0.69	
v/s Ratio Perm			0.00			0.00	0.48		0.01	0.16		0.21
v/c Ratio	0.65	0.02	0.02		0.31	0.03	0.72	0.56	0.01	0.24	1.00	0.31
Uniform Delay, d1	81.3	75.8	75.7		90.6	89.9	53.7	16.1	10.0	11.0	29.7	11.8
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.1	0.2	0.1		3.7	0.3	25.5	1.0	0.0	0.5	18.8	0.9
Delay (s)	96.4	75.9	75.9		94.4	90.2	79.2	17.0	10.1	11.4	48.5	12.7
Level of Service	F	E	E		F	F	E	B	B	B	D	B
Approach Delay (s)		92.5			91.4			19.7			44.0	
Approach LOS		F			F			B			D	

Intersection Summary			
HCM Average Control Delay	38.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	28	42	1358	103	174	2413
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		4%			-1%
Total Lost time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1388	1242	3402	1522	1744	3489
Flt Permitted	0.95	1.00	1.00	1.00	0.17	1.00
Satd. Flow (perm)	1388	1242	3402	1522	310	3489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	42	1358	103	174	2413
RTOR Reduction (vph)	0	40	0	16	0	0
Lane Group Flow (vph)	28	2	1358	87	174	2413
Heavy Vehicles (%)	30%	30%	4%	4%	4%	4%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	10.2	10.2	169.0	169.0	186.3	186.3
Effective Green, g (s)	10.2	10.2	169.0	169.0	186.3	186.3
Actuated g/C Ratio	0.05	0.05	0.80	0.80	0.89	0.89
Clearance Time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Vehicle Extension (s)	5.0	5.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	67	60	2738	1225	345	3095
v/s Ratio Prot	c0.02		0.40		0.02	c0.69
v/s Ratio Perm		0.00		0.06	0.42	
v/c Ratio	0.42	0.03	0.50	0.07	0.50	0.78
Uniform Delay, d1	97.0	95.2	6.7	4.2	4.9	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.6	0.5	0.6	0.1	1.2	2.0
Delay (s)	105.6	95.7	7.3	4.4	6.1	6.4
Level of Service	F	F	A	A	A	A
Approach Delay (s)	99.7		7.1			6.3
Approach LOS	F		A			A

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	210.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	477	15	1	575	52	59	70	35	258	20	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050
Grade (%)		3%			-2%			4%			-3%	
Total Lost time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1743	1826		1787	1881	1599		1785	1552	1796	1891	1734
Flt Permitted	0.17	1.00		0.40	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	314	1826		758	1881	1599		1785	1552	1796	1891	1734
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	477	15	1	575	52	59	70	35	258	20	373
RTOR Reduction (vph)	0	1	0	0	0	21	0	0	31	0	0	0
Lane Group Flow (vph)	155	491	0	1	575	31	0	129	4	258	20	373
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2			3			4
Actuated Green, G (s)	81.4	73.3		62.3	61.2	61.2		15.6	15.6	32.5	32.5	32.5
Effective Green, g (s)	81.4	73.3		62.3	61.2	61.2		15.6	15.6	32.5	32.5	32.5
Actuated g/C Ratio	0.54	0.49		0.42	0.41	0.41		0.10	0.10	0.22	0.22	0.22
Clearance Time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	892		322	767	652		186	161	389	410	376
v/s Ratio Prot	c0.05	c0.27		0.00	c0.31			c0.07		0.14	0.01	
v/s Ratio Perm	0.24			0.00		0.02			0.00			c0.22
v/c Ratio	0.52	0.55		0.00	0.75	0.05		0.69	0.02	0.66	0.05	0.99
Uniform Delay, d1	24.5	26.8		26.0	37.9	26.8		64.9	60.4	53.7	46.5	58.6
Progression Factor	1.36	0.55		1.00	1.00	1.00		1.00	1.00	0.43	0.38	0.47
Incremental Delay, d2	1.2	2.3		0.0	6.6	0.1		10.7	0.1	1.8	0.0	27.8
Delay (s)	34.6	17.1		26.0	44.5	26.9		75.5	60.4	25.1	17.9	55.3
Level of Service	C	B		C	D	C		E	E	C	B	E
Approach Delay (s)		21.3			43.0			72.3			42.2	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	34.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

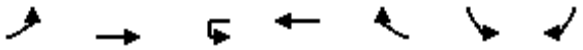
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	965	228	50	635	2	35	0	4	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1752	3504	1567	1787	3573			1770	1583		1695	
Flt Permitted	0.41	1.00	1.00	0.28	1.00			0.76	1.00		0.83	
Satd. Flow (perm)	756	3504	1567	519	3573			1409	1583		1439	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	19	965	228	50	635	2	35	0	4	1	0	1
RTOR Reduction (vph)	0	0	51	0	0	0	0	0	4	0	1	0
Lane Group Flow (vph)	19	965	177	50	637	0	0	35	0	0	1	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4		4	8		
Actuated Green, G (s)	119.9	116.3	116.3	122.9	117.8			8.1	8.1		8.1	
Effective Green, g (s)	119.9	116.3	116.3	122.9	117.8			8.1	8.1		8.1	
Actuated g/C Ratio	0.80	0.78	0.78	0.82	0.79			0.05	0.05		0.05	
Clearance Time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0		7.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	628	2717	1215	468	2806			76	85		78	
v/s Ratio Prot	0.00	c0.28		c0.00	0.18							
v/s Ratio Perm	0.02		0.11	0.08				c0.02	0.00		0.00	
v/c Ratio	0.03	0.36	0.15	0.11	0.23			0.46	0.00		0.01	
Uniform Delay, d1	3.1	5.2	4.3	2.8	4.2			68.8	67.1		67.2	
Progression Factor	0.48	0.32	0.03	0.68	0.42			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.3	0.2	0.1	0.1			4.4	0.0		0.1	
Delay (s)	1.5	2.0	0.4	1.9	1.9			73.2	67.1		67.2	
Level of Service	A	A	A	A	A			E	E		E	
Approach Delay (s)		1.7			1.9			72.6			67.2	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	3.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	406	829	203	197	298	91	6	85	29	180	480	220
Ideal Flow (vphpl)	2000	1900	1900	1900	2000	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-5%			-3%			-4%	
Total Lost time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	3468	1552	3519	3819	1623	1832	3664	1639	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.48	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	3541	3468	1552	3519	3819	1623	922	3664	1639	919	3610	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	406	829	203	197	298	91	6	85	29	180	480	220
RTOR Reduction (vph)	0	0	54	0	0	41	0	0	23	0	0	139
Lane Group Flow (vph)	406	829	149	197	298	50	6	85	6	180	480	81
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	22.4	72.7	74.1	13.8	64.1	82.9	17.1	15.7	29.5	41.5	33.1	55.5
Effective Green, g (s)	22.4	72.7	74.1	13.8	64.1	82.9	17.1	15.7	29.5	41.5	33.1	55.5
Actuated g/C Ratio	0.15	0.48	0.49	0.09	0.43	0.55	0.11	0.10	0.20	0.28	0.22	0.37
Clearance Time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	529	1681	767	324	1632	897	114	383	322	365	797	598
v/s Ratio Prot	c0.11	c0.24	0.00	0.06	0.08	0.01	0.00	0.02	0.00	c0.06	c0.13	0.02
v/s Ratio Perm			0.09			0.02	0.01		0.00	0.07		0.03
v/c Ratio	0.77	0.49	0.19	0.61	0.18	0.06	0.05	0.22	0.02	0.49	0.60	0.14
Uniform Delay, d1	61.3	26.2	21.2	65.5	26.7	15.5	59.1	61.6	48.6	43.8	52.5	31.3
Progression Factor	1.00	1.00	1.00	1.00	0.71	1.78	1.00	1.00	1.00	0.88	0.87	0.23
Incremental Delay, d2	6.6	1.0	0.1	3.2	0.2	0.0	0.2	0.3	0.0	1.0	1.2	0.1
Delay (s)	67.9	27.2	21.4	68.9	19.1	27.6	59.3	61.8	48.6	39.4	46.9	7.2
Level of Service	E	C	C	E	B	C	E	E	D	D	D	A
Approach Delay (s)		37.9			37.1			58.5			35.4	
Approach LOS		D			D			E			D	

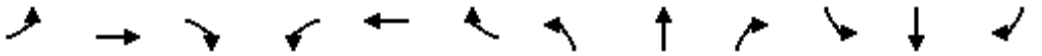
Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	71	1198	3	438	91	94	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%		-1%		-6%	
Total Lost time (s)	7.0	6.5	7.0	6.5		7.0	
Lane Util. Factor	1.00	0.95	1.00	0.95		1.00	
Frt	1.00	1.00	1.00	0.97		0.99	
Flt Protected	0.95	1.00	0.95	1.00		0.96	
Satd. Flow (prot)	1744	3480	1761	3431		1848	
Flt Permitted	0.40	1.00	0.95	1.00		0.96	
Satd. Flow (perm)	728	3480	1761	3431		1848	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	1198	3	438	91	94	10
RTOR Reduction (vph)	0	0	0	13	0	3	0
Lane Group Flow (vph)	71	1198	3	516	0	101	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	0%	0%
Bus Blockages (#/hr)	0	1	0	0	0	0	0
Turn Type	pm+pt	NA	Prot	NA		NA	
Protected Phases	5	2	1	6		3	
Permitted Phases	2						
Actuated Green, G (s)	42.7	37.1	0.8	32.3		7.6	
Effective Green, g (s)	42.7	37.1	0.8	32.3		7.6	
Actuated g/C Ratio	0.65	0.56	0.01	0.49		0.12	
Clearance Time (s)	7.0	6.5	7.0	6.5		7.0	
Vehicle Extension (s)	2.5	3.0	2.0	3.0		3.0	
Lane Grp Cap (vph)	557	1956	21	1679		213	
v/s Ratio Prot	c0.01	c0.34	0.00	0.15		c0.05	
v/s Ratio Perm	0.07						
v/c Ratio	0.13	0.61	0.14	0.31		0.48	
Uniform Delay, d1	4.5	9.6	32.3	10.1		27.3	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.1	0.6	1.1	0.1		1.7	
Delay (s)	4.6	10.2	33.4	10.2		29.0	
Level of Service	A	B	C	B		C	
Approach Delay (s)		9.9		10.4		29.0	
Approach LOS		A		B		C	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰	↱
Volume (vph)	0	1203	298	110	252	0	0	0	0	132	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			3%	
Total Lost time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5034	1567	1787	3575					1656	1661	1560
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5034	1567	1787	3575					1656	1661	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1203	298	110	252	0	0	0	0	132	1	160
RTOR Reduction (vph)	0	0	182	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	0	1203	116	110	252	0	0	0	0	66	67	19
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		35.0	35.0	23.9	65.9					10.6	10.6	10.6
Effective Green, g (s)		35.0	35.0	23.9	65.9					10.6	10.6	10.6
Actuated g/C Ratio		0.39	0.39	0.27	0.73					0.12	0.12	0.12
Clearance Time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Vehicle Extension (s)		5.0	5.0	3.5	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1958	609	475	2618					195	196	184
v/s Ratio Prot		c0.24		c0.06	0.07					0.04	c0.04	
v/s Ratio Perm			0.07									0.01
v/c Ratio		0.61	0.19	0.23	0.10					0.34	0.34	0.10
Uniform Delay, d1		22.1	18.1	25.9	3.5					36.5	36.5	35.5
Progression Factor		1.00	1.00	0.63	2.77					1.00	1.00	1.00
Incremental Delay, d2		1.5	0.7	1.0	0.1					1.0	1.0	0.2
Delay (s)		23.5	18.8	17.1	9.7					37.5	37.5	35.7
Level of Service		C	B	B	A					D	D	D
Approach Delay (s)		22.6			11.9			0.0			36.5	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	390	989	348	201	20	131
v/c Ratio	0.60	0.40	0.22	0.25	0.08	0.58
Control Delay	22.6	1.0	18.1	4.1	31.6	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	1.0	18.1	4.1	31.6	45.3
Queue Length 50th (ft)	31	0	63	0	10	71
Queue Length 95th (ft)	25	1	113	46	28	119
Internal Link Dist (ft)		451	1741		948	
Turn Bay Length (ft)	184			280		215
Base Capacity (vph)	654	2470	1555	809	704	626
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.40	0.22	0.25	0.03	0.21

Intersection Summary

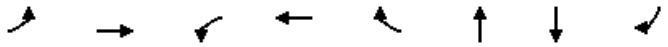
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	390	989	0	0	348	201	19	1	131	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			0%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3399	3504			3575	1599		1760	1567			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3399	3504			3575	1599		1760	1567			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	390	989	0	0	348	201	19	1	131	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	113	0	0	0	0	0	0
Lane Group Flow (vph)	390	989	0	0	348	88	0	20	131	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	5	2			6		4	4	4			
Permitted Phases						6						
Actuated Green, G (s)	17.3	63.5			39.2	39.2		13.0	13.0			
Effective Green, g (s)	17.3	63.5			39.2	39.2		13.0	13.0			
Actuated g/C Ratio	0.19	0.71			0.44	0.44		0.14	0.14			
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Vehicle Extension (s)	4.0	5.0			5.0	5.0		3.0	3.0			
Lane Grp Cap (vph)	653	2472			1557	696		254	226			
v/s Ratio Prot	c0.11	c0.28			0.10			0.01	c0.08			
v/s Ratio Perm						0.05						
v/c Ratio	0.60	0.40			0.22	0.13		0.08	0.58			
Uniform Delay, d1	33.2	5.4			15.9	15.2		33.3	35.9			
Progression Factor	0.59	0.10			1.00	1.00		1.00	1.00			
Incremental Delay, d2	1.5	0.4			0.3	0.4		0.1	3.6			
Delay (s)	20.9	1.0			16.2	15.5		33.5	39.5			
Level of Service	C	A			B	B		C	D			
Approach Delay (s)		6.6			16.0			38.7			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	6	4	39	3	158	6	844	426	1350	984	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.94		1.00	0.86	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1768		1732	1503	1550	1752	3504	1567	3399	3504	1567
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1768		1732	1503	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	6	4	39	3	158	6	844	426	1350	984	27
RTOR Reduction (vph)	0	4	0	0	72	40	0	0	113	0	0	5
Lane Group Flow (vph)	3	6	0	35	11	42	6	844	313	1350	984	22
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	3.6	3.6		10.8	10.8	116.4	2.4	81.9	81.9	105.6	185.1	185.1
Effective Green, g (s)	3.6	3.6		10.8	10.8	116.4	2.4	81.9	81.9	105.6	185.1	185.1
Actuated g/C Ratio	0.02	0.02		0.05	0.05	0.51	0.01	0.36	0.36	0.46	0.81	0.81
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	28	28		81	71	832	18	1248	558	1561	2821	1262
v/s Ratio Prot	0.00	c0.00		c0.02	0.01	0.02	0.00	c0.24		c0.40	0.28	
v/s Ratio Perm						0.00			0.20			0.01
v/c Ratio	0.11	0.22		0.43	0.15	0.05	0.33	0.68	0.56	0.86	0.35	0.02
Uniform Delay, d1	111.6	111.8		106.6	105.1	28.7	113.0	62.8	59.5	55.7	6.1	4.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	3.9		3.7	1.0	0.0	10.6	1.9	2.1	5.4	0.2	0.0
Delay (s)	113.3	115.6		110.2	106.1	28.8	123.6	64.7	61.6	61.2	6.2	4.4
Level of Service	F	F		F	F	C	F	E	E	E	A	A
Approach Delay (s)		115.1			75.1			63.9			37.6	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM Average Control Delay	48.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	229.9	Sum of lost time (s)	28.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	143	1762	8	409	136	7	89	67
v/c Ratio	0.76	0.44	0.10	0.12	0.12	0.03	0.58	0.22
Control Delay	91.4	3.1	71.2	11.5	0.9	0.1	80.2	1.7
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.4	3.3	71.2	11.5	0.9	0.1	80.2	1.7
Queue Length 50th (ft)	148	37	8	51	0	0	85	0
Queue Length 95th (ft)	m173	m265	27	94	11	0	142	0
Internal Link Dist (ft)		452		967		434	639	
Turn Bay Length (ft)	250		255		360			175
Base Capacity (vph)	214	4015	82	3297	1090	552	436	527
Starvation Cap Reductn	0	1090	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.60	0.10	0.12	0.12	0.01	0.20	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	1750	12	8	409	136	3	0	4	89	0	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			0%			0%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (prot)	1787	5131		1770	5085	1583		1683			1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (perm)	1787	5131		1770	5085	1583		1683			1770	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	143	1750	12	8	409	136	3	0	4	89	0	67
RTOR Reduction (vph)	0	0	0	0	0	53	0	7	0	0	0	61
Lane Group Flow (vph)	143	1762	0	8	409	83	0	0	0	0	89	6
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases						2						3
Actuated Green, G (s)	15.9	106.2		1.4	91.7	91.7		1.4			13.0	13.0
Effective Green, g (s)	15.9	106.2		1.4	91.7	91.7		1.4			13.0	13.0
Actuated g/C Ratio	0.11	0.71		0.01	0.61	0.61		0.01			0.09	0.09
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0			3.0	3.0
Lane Grp Cap (vph)	189	3632		16	3108	967		15			153	137
v/s Ratio Prot	c0.08	c0.34		0.00	0.08			c0.00			c0.05	
v/s Ratio Perm						0.05						0.00
v/c Ratio	0.76	0.49		0.50	0.13	0.09		0.00			0.58	0.04
Uniform Delay, d1	65.2	9.7		74.0	12.3	12.0		73.6			65.9	62.8
Progression Factor	1.13	0.40		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	11.5	0.3		22.5	0.1	0.2		0.1			5.5	0.1
Delay (s)	85.2	4.2		96.5	12.4	12.1		73.7			71.4	62.9
Level of Service	F	A		F	B	B		E			E	E
Approach Delay (s)		10.3			13.6			73.7			67.8	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	798	998	37	28	508	422	6	27	107	110	34
v/c Ratio	0.66	0.56	0.06	0.07	0.46	0.63	0.04	0.16	0.41	0.41	0.09
Control Delay	41.5	38.0	0.2	36.6	37.8	26.6	67.0	49.4	60.2	60.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.4	1.9	0.0	0.0	0.0	0.0	0.0
Total Delay	41.5	38.0	0.2	36.6	38.2	28.5	67.0	49.4	60.2	60.3	0.5
Queue Length 50th (ft)	316	274	0	20	147	179	5	15	94	96	0
Queue Length 95th (ft)	445	351	0	57	221	376	23	51	173	177	0
Internal Link Dist (ft)		967			196			671		824	
Turn Bay Length (ft)	500		200						430		430
Base Capacity (vph)	1581	3323	1070	388	1322	722	509	512	613	621	670
Starvation Cap Reductn	0	0	0	0	383	165	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.30	0.03	0.07	0.54	0.76	0.01	0.05	0.17	0.18	0.05

Intersection Summary

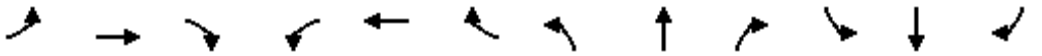
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	798	998	37	28	508	422	6	17	10	191	26	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			0%			-3%	
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3467	5136	1599	1752	5034	1567	1770	1759		1706	1730	1607
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3467	5136	1599	1752	5034	1567	1770	1759		1706	1730	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	798	998	37	28	508	422	6	17	10	191	26	34
RTOR Reduction (vph)	0	0	24	0	0	330	0	9	0	0	0	29
Lane Group Flow (vph)	798	998	13	28	508	92	6	18	0	107	110	5
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		8	8		3	3	
Permitted Phases			6			2						3
Actuated Green, G (s)	46.0	45.7	45.7	29.4	29.1	29.1	8.6	8.6		20.6	20.6	20.6
Effective Green, g (s)	46.0	45.7	45.7	29.4	29.1	29.1	8.6	8.6		20.6	20.6	20.6
Actuated g/C Ratio	0.35	0.34	0.34	0.22	0.22	0.22	0.06	0.06		0.15	0.15	0.15
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.5	3.0	3.0	3.0	3.0	3.0	4.0	4.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1196	1760	548	386	1098	342	114	113		263	267	248
v/s Ratio Prot	c0.23	0.19		0.02	c0.10		0.00	c0.01		0.06	c0.06	
v/s Ratio Perm			0.01			0.06						0.00
v/c Ratio	0.67	0.57	0.02	0.07	0.46	0.27	0.05	0.16		0.41	0.41	0.02
Uniform Delay, d1	37.1	35.7	29.0	41.2	45.3	43.3	58.5	58.9		50.8	50.9	47.8
Progression Factor	1.00	1.00	1.00	0.74	0.76	4.64	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.4	0.0	0.1	0.3	0.4	0.3	0.9		1.0	1.0	0.0
Delay (s)	38.6	36.2	29.0	30.5	34.6	201.2	58.8	59.8		51.9	51.9	47.8
Level of Service	D	D	C	C	C	F	E	E		D	D	D
Approach Delay (s)		37.1			107.9			59.6			51.3	
Approach LOS		D			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	60.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	133.3	Sum of lost time (s)	29.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	737	15	3	2503	7	562	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.91	1.00	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	1770	5085	1583
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	737	15	3	2503	7	562	145
RTOR Reduction (vph)	0	9	0	0	0	0	50
Lane Group Flow (vph)	737	6	3	2503	7	562	95
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	45.4	46.8	1.4	129.7	2.9	131.2	131.2
Effective Green, g (s)	45.4	46.8	1.4	129.7	2.9	131.2	131.2
Actuated g/C Ratio	0.23	0.23	0.01	0.65	0.01	0.66	0.66
Clearance Time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	779	370	12	3298	26	3336	1038
v/s Ratio Prot	c0.21	0.00	0.00	c0.49	c0.00	0.11	
v/s Ratio Perm		0.00					0.06
v/c Ratio	0.95	0.02	0.25	0.76	0.27	0.17	0.09
Uniform Delay, d1	76.1	58.9	98.8	24.3	97.5	13.3	12.6
Progression Factor	1.00	1.00	1.41	0.20	0.60	2.16	8.97
Incremental Delay, d2	20.1	0.0	7.3	1.2	5.5	0.1	0.2
Delay (s)	96.2	58.9	146.8	6.1	64.2	28.9	113.1
Level of Service	F	E	F	A	E	C	F
Approach Delay (s)	95.4			6.3		46.3	
Approach LOS	F			A		D	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

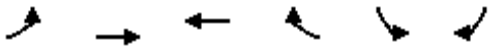


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	134	3187	1	1	612	103	1	0	2	335	1	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.5		7.5		7.5	7.5	7.0
Lane Util. Factor	0.97	0.91		1.00	0.86	1.00		1.00		0.95	0.91	0.95
Frt	1.00	1.00		1.00	1.00	0.85		0.91		1.00	0.99	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3433	5085		1770	6408	1583		1667		1681	1606	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3433	5085		1770	6408	1583		1667		1681	1606	1504
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	134	3187	1	1	612	103	1	0	2	335	1	86
RTOR Reduction (vph)	0	0	0	0	0	22	0	2	0	0	1	62
Lane Group Flow (vph)	134	3188	0	1	612	81	0	1	0	174	170	15
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA		Split	NA	pm+ov
Protected Phases	1	6		5	2	4	3	3		4	4	1
Permitted Phases						2						4
Actuated Green, G (s)	13.2	141.9		1.2	129.9	156.4		1.4		26.5	26.5	39.7
Effective Green, g (s)	13.2	141.9		1.2	129.9	156.4		1.4		26.5	26.5	39.7
Actuated g/C Ratio	0.07	0.71		0.01	0.65	0.78		0.01		0.13	0.13	0.20
Clearance Time (s)	7.0	7.0		7.0	7.0	7.5		7.5		7.5	7.5	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	227	3608		11	4162	1238		12		223	213	299
v/s Ratio Prot	c0.04	c0.63		0.00	0.10	0.01		c0.00		0.10	c0.11	0.00
v/s Ratio Perm						0.04						0.01
v/c Ratio	0.59	0.88		0.09	0.15	0.07		0.08		0.78	0.80	0.05
Uniform Delay, d1	90.8	22.6		98.9	13.6	5.0		98.7		83.9	84.2	64.9
Progression Factor	1.16	1.03		1.05	0.27	0.60		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	2.3		3.5	0.1	0.0		3.0		16.1	18.5	0.1
Delay (s)	108.0	25.6		107.7	3.7	3.0		101.7		100.0	102.7	65.0
Level of Service	F	C		F	A	A		F		F	F	E
Approach Delay (s)		28.9			3.7			101.7			94.7	
Approach LOS		C			A			F			F	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1094	2390	12	12	502	98	9	156	191	41	16	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.91		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	0.76
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5081		1770	6408	1583	1770	1863	1583	3433	1863	3610
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5081		1770	6408	1583	1770	1863	1583	3433	1863	3610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1094	2390	12	12	502	98	9	156	191	41	16	194
RTOR Reduction (vph)	0	0	0	0	0	40	0	0	129	0	0	137
Lane Group Flow (vph)	1094	2402	0	12	502	58	9	156	62	41	16	57
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	custom
Protected Phases	1 3	6		5	2	8	7	7		8	8	8 1
Permitted Phases						2			7			
Actuated Green, G (s)	75.7	137.9		3.3	58.5	68.7	20.6	20.6	20.6	10.2	10.2	58.8
Effective Green, g (s)	75.7	137.9		3.3	58.5	68.7	20.6	20.6	20.6	10.2	10.2	58.8
Actuated g/C Ratio	0.38	0.69		0.02	0.29	0.34	0.10	0.10	0.10	0.05	0.05	0.29
Clearance Time (s)		7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)		4.0		3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	1299	3503		29	1874	544	182	192	163	175	95	1061
v/s Ratio Prot	c0.32	c0.47		0.01	0.08	0.01	0.01	c0.08		c0.01	0.01	0.02
v/s Ratio Perm						0.03			0.04			
v/c Ratio	0.84	0.69		0.41	0.27	0.11	0.05	0.81	0.38	0.23	0.17	0.05
Uniform Delay, d1	56.7	18.3		97.4	54.3	44.7	80.9	87.8	83.7	91.1	90.8	50.6
Progression Factor	1.11	0.57		0.97	0.96	0.88	1.00	1.00	1.00	0.91	0.90	2.49
Incremental Delay, d2	3.1	0.7		9.1	0.3	0.1	0.2	23.4	2.0	0.9	1.1	0.0
Delay (s)	66.3	11.2		103.1	52.2	39.3	81.0	111.2	85.7	84.0	82.6	126.4
Level of Service	E	B		F	D	D	F	F	F	F	F	F
Approach Delay (s)		28.4			51.2			96.8			116.7	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	41.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	394	2073	569	921	833	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.5	7.5	4.0	7.5	7.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	3539	3539	1583	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	394	2073	569	921	833	22
RTOR Reduction (vph)	0	0	0	0	0	13
Lane Group Flow (vph)	394	2073	569	921	833	9
Turn Type	Prot	NA	NA	Free	NA	pt+ov
Protected Phases	1	6	2		4	4 1
Permitted Phases				Free		
Actuated Green, G (s)	25.6	120.5	87.9	180.0	44.5	77.6
Effective Green, g (s)	25.6	120.5	87.9	180.0	44.5	77.6
Actuated g/C Ratio	0.14	0.67	0.49	1.00	0.25	0.43
Clearance Time (s)	7.0	7.5	7.5		7.5	
Vehicle Extension (s)	3.0	5.0	5.0		3.5	
Lane Grp Cap (vph)	488	2369	1728	1583	849	682
v/s Ratio Prot	0.11	c0.59	0.16		c0.24	0.01
v/s Ratio Perm				0.58		
v/c Ratio	0.81	0.88	0.33	0.58	0.98	0.01
Uniform Delay, d1	74.8	23.7	28.1	0.0	67.3	29.3
Progression Factor	1.00	1.00	0.49	1.00	1.00	1.00
Incremental Delay, d2	9.5	4.9	0.4	1.3	26.2	0.0
Delay (s)	84.3	28.6	14.1	1.3	93.6	29.3
Level of Service	F	C	B	A	F	C
Approach Delay (s)		37.5	6.2		91.9	
Approach LOS		D	A		F	

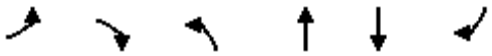
Intersection Summary			
HCM Average Control Delay	37.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1838	1047	93	1363	34	147	7	10	102	64	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	7.0	7.5	7.5	7.0	7.5		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1577	1770	3526		3433	1698		1593	1676	1478
Flt Permitted	0.15	1.00	1.00	0.04	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	282	3539	1577	71	3526		3433	1698		1593	1676	1478
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1838	1047	93	1363	34	147	7	10	102	64	6
RTOR Reduction (vph)	0	0	205	0	1	0	0	9	0	0	0	5
Lane Group Flow (vph)	5	1838	842	93	1396	0	147	8	0	102	64	1
Bus Blockages (#/hr)	0	0	1	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases	2		2	6								3
Actuated Green, G (s)	111.6	110.2	110.2	128.7	120.3		12.4	12.4		17.4	17.4	17.4
Effective Green, g (s)	111.6	110.2	110.2	128.7	120.3		12.4	12.4		17.4	17.4	17.4
Actuated g/C Ratio	0.62	0.61	0.61	0.71	0.67		0.07	0.07		0.10	0.10	0.10
Clearance Time (s)	7.0	7.5	7.5	7.0	7.5		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	186	2167	965	159	2357		236	117		154	162	143
v/s Ratio Prot	0.00	0.52		c0.04	c0.40		c0.04	0.00		c0.06	0.04	
v/s Ratio Perm	0.02		c0.53	0.38								0.00
v/c Ratio	0.03	0.85	0.87	0.58	0.59		0.62	0.07		0.66	0.40	0.00
Uniform Delay, d1	14.6	28.2	29.0	45.0	16.4		81.5	78.4		78.5	76.4	73.5
Progression Factor	0.92	0.80	0.64	1.35	0.69		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	1.8	4.8	5.9	1.0		5.7	0.3		11.2	2.2	0.0
Delay (s)	13.5	24.4	23.2	66.7	12.3		87.2	78.7		89.7	78.5	73.5
Level of Service	B	C	C	E	B		F	E		F	E	E
Approach Delay (s)		23.9			15.7			86.3			84.9	
Approach LOS		C			B			F			F	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	104	130	1460	532	337	1357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.14	1.00
Satd. Flow (perm)	3433	1583	3539	1583	516	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	104	130	1460	532	337	1357
RTOR Reduction (vph)	0	122	0	101	0	0
Lane Group Flow (vph)	104	8	1460	431	337	1357
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	10.8	10.8	139.1	139.1	155.7	155.7
Effective Green, g (s)	10.8	10.8	139.1	139.1	155.7	155.7
Actuated g/C Ratio	0.06	0.06	0.77	0.77	0.86	0.86
Clearance Time (s)	6.5	6.5	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	6.0	6.0	3.0	6.0
Lane Grp Cap (vph)	206	95	2735	1223	602	3061
v/s Ratio Prot	c0.03		0.41		0.03	c0.38
v/s Ratio Perm		0.00		0.27	c0.45	
v/c Ratio	0.50	0.08	0.53	0.35	0.56	0.44
Uniform Delay, d1	82.0	79.9	7.9	6.4	7.2	2.7
Progression Factor	1.00	1.00	0.02	0.00	4.86	0.88
Incremental Delay, d2	1.9	0.4	0.4	0.5	1.0	0.4
Delay (s)	84.0	80.3	0.6	0.5	35.7	2.7
Level of Service	F	F	A	A	D	A
Approach Delay (s)	81.9		0.6			9.3
Approach LOS	F		A			A

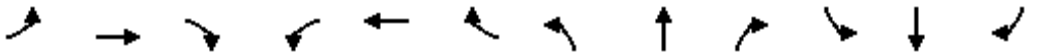
Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	6	1451	1737	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			-3%	4%	
Total Lost time (s)	7.0	7.0	7.0	6.5	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1796	3592	3468	1552
Flt Permitted	0.95	1.00	0.12	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	219	3592	3468	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	1	6	1451	1737	1
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1	0	6	1451	1737	1
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	1.4	1.4	165.1	165.1	156.7	156.7
Effective Green, g (s)	1.4	1.4	165.1	165.1	156.7	156.7
Actuated g/C Ratio	0.01	0.01	0.92	0.92	0.87	0.87
Clearance Time (s)	7.0	7.0	7.0	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	14	12	213	3295	3019	1351
v/s Ratio Prot	c0.00		0.00	c0.40	c0.50	
v/s Ratio Perm		0.00	0.03			0.00
v/c Ratio	0.07	0.00	0.03	0.44	0.58	0.00
Uniform Delay, d1	88.7	88.6	2.3	1.0	3.0	1.5
Progression Factor	1.00	1.00	0.48	0.32	1.35	1.15
Incremental Delay, d2	2.2	0.0	0.0	0.4	0.6	0.0
Delay (s)	90.8	88.6	1.2	0.7	4.6	1.7
Level of Service	F	F	A	A	A	A
Approach Delay (s)	89.7			0.7	4.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM Average Control Delay	2.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

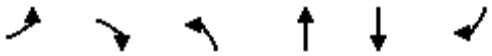


Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL2	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1021	333	111	1220	12	323	21	32	32	73	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050	2050	2050
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0			8.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91			0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1694			1838	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1694			1838	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	1021	333	111	1220	12	323	21	32	32	73	151
RTOR Reduction (vph)	0	0	222	0	0	7	0	0	0	0	0	0
Lane Group Flow (vph)	100	1021	111	111	1220	5	323	53	0	0	256	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2 5		1	1 2		3	3		6	6	
Permitted Phases			2 5			1 2						
Actuated Green, G (s)	13.7	60.1	60.1	33.0	79.4	79.4	22.2	22.2			25.3	
Effective Green, g (s)	13.7	60.1	60.1	33.0	79.4	79.4	22.2	22.2			25.3	
Actuated g/C Ratio	0.08	0.33	0.33	0.18	0.44	0.44	0.12	0.12			0.14	
Clearance Time (s)	8.0			8.0			7.0	7.0			8.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	135	1182	529	325	1561	698	423	209			258	
v/s Ratio Prot	0.06	c0.29		0.06	c0.34		c0.09	0.03			c0.14	
v/s Ratio Perm			0.07			0.00						
v/c Ratio	0.74	0.86	0.21	0.34	0.78	0.01	0.76	0.25			0.99	
Uniform Delay, d1	81.4	56.1	42.9	64.0	42.9	28.2	76.4	71.4			77.3	
Progression Factor	0.84	0.76	0.95	0.93	1.53	2.04	1.00	1.00			1.00	
Incremental Delay, d2	18.2	6.3	0.2	0.6	2.4	0.0	8.0	0.6			53.6	
Delay (s)	86.9	48.7	41.1	60.2	67.8	57.6	84.3	72.0			130.9	
Level of Service	F	D	D	E	E	E	F	E			F	
Approach Delay (s)		49.6			67.1			82.6			130.9	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM Average Control Delay	66.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	38.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SER	SER2
Lane Configurations			
Volume (vph)	1	1	1
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	7.0		
Lane Util. Factor	1.00		
Frt	0.91		
Flt Protected	0.98		
Satd. Flow (prot)	1667		
Flt Permitted	0.98		
Satd. Flow (perm)	1667		
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1	1	1
RTOR Reduction (vph)	1	0	0
Lane Group Flow (vph)	2	0	0
Turn Type	NA		
Protected Phases	4		
Permitted Phases			
Actuated Green, G (s)	1.4		
Effective Green, g (s)	1.4		
Actuated g/C Ratio	0.01		
Clearance Time (s)	7.0		
Vehicle Extension (s)	3.0		
Lane Grp Cap (vph)	13		
v/s Ratio Prot	c0.00		
v/s Ratio Perm			
v/c Ratio	0.15		
Uniform Delay, d1	88.7		
Progression Factor	1.00		
Incremental Delay, d2	5.5		
Delay (s)	94.2		
Level of Service	F		
Approach Delay (s)	94.2		
Approach LOS	F		

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	52	137	380	410	333	232
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	52	137	380	410	333	232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1503	333	333			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1503	333	333			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	44	81	69			
cM capacity (veh/h)	92	709	1226			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	189	380	410	333	232
Volume Left	52	380	0	0	0
Volume Right	137	0	0	0	232
cSH	250	1226	1700	1700	1700
Volume to Capacity	0.76	0.31	0.24	0.20	0.14
Queue Length 95th (ft)	136	33	0	0	0
Control Delay (s)	53.5	9.2	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	53.5	4.4		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	8.8			
Intersection Capacity Utilization	59.9%	ICU Level of Service		B
Analysis Period (min)	15			

Existing LOS – PM Public Roads

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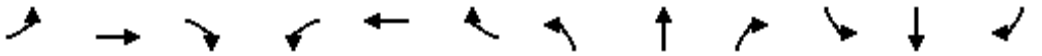
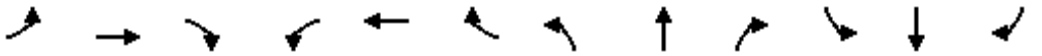
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	1264	44	195	3385	82	25	4	104	103	8	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1577	1770	5085	1577	1770	1863	1583	1711	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.76	1.00	1.00
Satd. Flow (perm)	1770	5085	1577	1770	5085	1577	1402	1863	1583	1360	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	29	1264	44	195	3385	82	25	4	104	103	8	80
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	95	0	0	68
Lane Group Flow (vph)	29	1264	44	195	3385	66	25	4	9	103	8	12
Bus Blockages (#/hr)	0	0	1	0	0	1	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1 3	6			4			8	
Permitted Phases			2			6	4		4	8		8
Actuated Green, G (s)	7.0	137.4	137.4	35.4	172.8	172.8	19.2	19.2	19.2	19.2	19.2	19.2
Effective Green, g (s)	7.0	137.4	137.4	35.4	172.8	172.8	19.2	19.2	19.2	19.2	19.2	19.2
Actuated g/C Ratio	0.03	0.62	0.62	0.16	0.79	0.79	0.09	0.09	0.09	0.09	0.09	0.09
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0		4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	56	3176	985	285	3994	1239	122	163	138	119	163	138
v/s Ratio Prot	0.02	0.25		c0.11	c0.67			0.00			0.00	
v/s Ratio Perm			0.03			0.04	0.02		0.01	c0.08		0.01
v/c Ratio	0.52	0.40	0.04	0.68	0.85	0.05	0.20	0.02	0.07	0.87	0.05	0.08
Uniform Delay, d1	104.8	20.6	16.0	87.0	15.1	5.3	93.3	91.8	92.2	99.1	92.0	92.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	0.4	0.1	5.3	2.4	0.1	0.8	0.1	0.2	43.8	0.1	0.3
Delay (s)	108.2	21.0	16.0	92.4	17.6	5.4	94.1	91.9	92.4	142.9	92.2	92.6
Level of Service	F	C	B	F	B	A	F	F	F	F	F	F
Approach Delay (s)		22.7			21.3			92.7			119.7	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	549	3	44	1	1	2	263	1193	0	3	830	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.5		7.5	7.5	7.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583	1770	1676		1770	3539		1770	3539	1583
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.25	1.00		0.24	1.00	1.00
Satd. Flow (perm)	1681	1686	1583	1770	1676		458	3539		440	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	549	3	44	1	1	2	263	1193	0	3	830	208
RTOR Reduction (vph)	0	0	28	0	2	0	0	0	0	0	0	58
Lane Group Flow (vph)	274	278	16	1	1	0	263	1193	0	3	830	150
Turn Type	Split	NA	pt+ov	Split	NA		pm+pt	NA		Perm	NA	pm+ov
Protected Phases	4	4	4 5	3	3		5	2			6	4
Permitted Phases							2			6		6
Actuated Green, G (s)	35.4	35.4	60.0	1.2	1.2		111.9	111.9		87.3	87.3	122.7
Effective Green, g (s)	35.4	35.4	60.0	1.2	1.2		111.9	111.9		87.3	87.3	122.7
Actuated g/C Ratio	0.21	0.21	0.35	0.01	0.01		0.66	0.66		0.51	0.51	0.72
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.5		7.5	7.5	7.0
Vehicle Extension (s)	5.0	5.0		2.0	2.0		4.0	4.0		4.0	4.0	5.0
Lane Grp Cap (vph)	350	351	559	12	12		437	2329		226	1817	1143
v/s Ratio Prot	0.16	c0.16	0.01	0.00	c0.00		0.06	c0.34			0.23	0.03
v/s Ratio Perm							c0.33			0.01		0.07
v/c Ratio	0.78	0.79	0.03	0.08	0.08		0.60	0.51		0.01	0.46	0.13
Uniform Delay, d1	63.7	63.8	35.9	83.9	83.9		15.1	15.0		20.3	26.3	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.35	1.32		0.61	0.56	1.11
Incremental Delay, d2	12.5	13.2	0.0	1.1	1.1		2.6	0.8		0.1	0.8	0.1
Delay (s)	76.2	77.0	36.0	84.9	85.0		23.0	20.5		12.4	15.5	8.2
Level of Service	E	E	D	F	F		C	C		B	B	A
Approach Delay (s)		73.6			85.0			21.0			14.0	
Approach LOS		E			F			C			B	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	549	3	44	1	1	2	263	1193	0	3	830	208
Ideal Flow (vphpl)	2050	2050	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1814	1819	1583		1817	1583	1770	3539		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98	1.00	0.27	1.00		0.21	1.00	1.00
Satd. Flow (perm)	1814	1819	1583		1817	1583	503	3539		391	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	549	3	44	1	1	2	263	1193	0	3	830	208
RTOR Reduction (vph)	0	0	34	0	0	2	0	0	0	0	0	0
Lane Group Flow (vph)	274	278	10	0	2	0	263	1193	0	3	830	208
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt	NA		pm+pt	NA	Free
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2			6		Free
Actuated Green, G (s)	26.0	26.0	39.4		1.4	2.8	121.6	113.2		102.6	101.2	170.0
Effective Green, g (s)	26.0	26.0	39.4		1.4	2.8	121.6	113.2		102.6	101.2	170.0
Actuated g/C Ratio	0.15	0.15	0.23		0.01	0.02	0.72	0.67		0.60	0.60	1.00
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	277	278	432		15	26	460	2357		247	2107	1583
v/s Ratio Prot	0.15	c0.15	0.00		0.00	0.00	c0.05	0.34		0.00	0.23	
v/s Ratio Perm			0.00			0.00	c0.36			0.01		c0.13
v/c Ratio	0.99	1.00	0.02		0.13	0.00	0.57	0.51		0.01	0.39	0.13
Uniform Delay, d1	71.9	72.0	50.4		83.7	82.2	10.5	14.3		13.8	18.2	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	2.60	0.41		0.44	0.31	1.00
Incremental Delay, d2	50.5	54.0	0.0		4.0	0.0	1.5	0.7		0.0	0.3	0.1
Delay (s)	122.4	126.0	50.5		87.7	82.2	28.9	6.6		6.0	6.0	0.1
Level of Service	F	F	D		F	F	C	A		A	A	A
Approach Delay (s)		118.8			85.0			10.6			4.8	
Approach LOS		F			F			B			A	

Intersection Summary			
HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

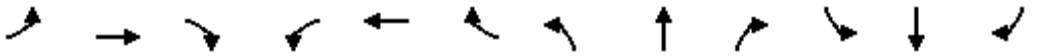
Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Group Flow (vph)	1283	313	420	2264	420
v/c Ratio	0.68	0.44	0.90	0.66	0.91
Control Delay	52.2	17.0	86.7	18.8	78.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	17.0	86.7	18.8	78.3
Queue Length 50th (ft)	485	87	478	563	403
Queue Length 95th (ft)	580	196	609	646	#546
Internal Link Dist (ft)	837			1008	920
Turn Bay Length (ft)			425		
Base Capacity (vph)	1874	716	521	3441	511
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.44	0.81	0.66	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

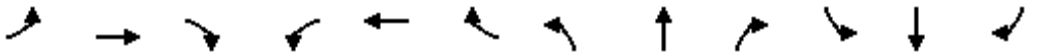
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑↑						✣	
Volume (vph)	0	1283	313	420	2264	0	0	0	0	142	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0	8.0	8.0						7.0	
Lane Util. Factor		0.91	1.00	1.00	0.91						1.00	
Frt		1.00	0.85	1.00	1.00						0.91	
Flt Protected		1.00	1.00	0.95	1.00						0.98	
Satd. Flow (prot)		5085	1583	1770	5085						1668	
Flt Permitted		1.00	1.00	0.95	1.00						0.98	
Satd. Flow (perm)		5085	1583	1770	5085						1668	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1283	313	420	2264	0	0	0	0	142	0	278
RTOR Reduction (vph)	0	0	133	0	0	0	0	0	0	0	60	0
Lane Group Flow (vph)	0	1283	180	420	2264	0	0	0	0	0	360	0
Turn Type		NA	Perm	Prot	NA					Perm	NA	
Protected Phases		2		1	6						8	
Permitted Phases			2							8		
Actuated Green, G (s)		66.4	66.4	47.4	121.8						43.2	
Effective Green, g (s)		66.4	66.4	47.4	121.8						43.2	
Actuated g/C Ratio		0.37	0.37	0.26	0.68						0.24	
Clearance Time (s)		8.0	8.0	8.0	8.0						7.0	
Vehicle Extension (s)		3.0	3.0	4.0	3.0						4.0	
Lane Grp Cap (vph)		1875	583	466	3440						400	
v/s Ratio Prot		c0.25		c0.24	0.45							
v/s Ratio Perm			0.11								0.22	
v/c Ratio		0.68	0.31	0.90	0.66						0.90	
Uniform Delay, d1		48.0	40.4	64.0	17.0						66.3	
Progression Factor		1.00	1.00	1.00	1.00						1.00	
Incremental Delay, d2		2.1	1.4	20.7	1.0						22.7	
Delay (s)		50.0	41.8	84.7	18.0						89.0	
Level of Service		D	D	F	B						F	
Approach Delay (s)		48.4			28.4			0.0			89.0	
Approach LOS		D			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	244	1	140	0	0	0	0	235	451	898	220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Lane Util. Factor	0.95	0.95	1.00					0.86	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1686	1583					6408	1583	3433	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1686	1583					6408	1583	3433	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	244	1	140	0	0	0	0	235	451	898	220	0
RTOR Reduction (vph)	0	0	124	0	0	0	0	0	357	0	0	0
Lane Group Flow (vph)	122	123	16	0	0	0	0	235	94	898	220	0
Turn Type	Split	NA	Perm					NA	Perm	Split	NA	
Protected Phases	2	2						1		6 8	6 8	
Permitted Phases			2						1			
Actuated Green, G (s)	18.6	18.6	18.6					33.4	33.4	87.0	87.0	
Effective Green, g (s)	18.6	18.6	18.6					33.4	33.4	87.0	87.0	
Actuated g/C Ratio	0.12	0.12	0.12					0.21	0.21	0.54	0.54	
Clearance Time (s)	7.0	7.0	7.0					7.0	7.0			
Vehicle Extension (s)	3.0	3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)	195	196	184					1338	330	1867	1924	
v/s Ratio Prot	0.07	c0.07						0.04		c0.26	0.06	
v/s Ratio Perm			0.01						c0.06			
v/c Ratio	0.63	0.63	0.09					0.18	0.29	0.48	0.11	
Uniform Delay, d1	67.4	67.4	63.1					52.0	53.3	22.6	17.8	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.13	0.03	
Incremental Delay, d2	6.1	6.1	0.2					0.1	0.7	0.2	0.0	
Delay (s)	73.5	73.5	63.3					52.1	53.9	3.1	0.6	
Level of Service	E	E	E					D	D	A	A	
Approach Delay (s)		69.8			0.0			53.3			2.6	
Approach LOS		E			A			D			A	

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	17	1	810	512	535	0	0	1080	629
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	4.0	7.0	7.0			7.0	7.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.86	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1694	1583	3433	3539			6408	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1694	1583	3433	3539			6408	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	17	1	810	512	535	0	0	1080	629
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	285
Lane Group Flow (vph)	0	0	0	9	9	810	512	535	0	0	1080	344
Turn Type				Split	NA	Free	Split	NA			NA	Perm
Protected Phases				8	8		1 2	1 2			6	
Permitted Phases						Free						6
Actuated Green, G (s)				14.1	14.1	160.0	59.0	59.0			65.9	65.9
Effective Green, g (s)				14.1	14.1	160.0	59.0	59.0			65.9	65.9
Actuated g/C Ratio				0.09	0.09	1.00	0.37	0.37			0.41	0.41
Clearance Time (s)				7.0	7.0						7.0	7.0
Vehicle Extension (s)				3.0	3.0						3.0	3.0
Lane Grp Cap (vph)				148	149	1583	1266	1305			2639	652
v/s Ratio Prot				0.01	0.01		0.15	0.15			0.17	
v/s Ratio Perm						c0.51						0.22
v/c Ratio				0.06	0.06	0.51	0.40	0.41			0.41	0.53
Uniform Delay, d1				66.9	66.9	0.0	37.5	37.6			33.3	35.4
Progression Factor				1.00	1.00	1.00	0.68	0.77			0.71	0.69
Incremental Delay, d2				0.2	0.2	1.2	0.3	0.3			0.3	2.2
Delay (s)				67.1	67.0	1.2	25.8	29.1			24.0	26.8
Level of Service				E	E	A	C	C			C	C
Approach Delay (s)		0.0			2.6			27.5			25.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	368	1205	631	158	1078	132	553	434	173	309	473	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3416	3522	1575	1770	3539	1577	3433	3539	1577	3433	3539	1577
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3416	3522	1575	1770	3539	1577	3433	3539	1577	3433	3539	1577
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	368	1205	631	158	1078	132	553	434	173	309	473	307
RTOR Reduction (vph)	0	0	217	0	0	48	0	0	141	0	0	222
Lane Group Flow (vph)	368	1205	414	158	1078	84	553	434	32	309	473	85
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	1	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	25.6	78.7	78.7	18.3	71.4	71.4	29.0	32.8	32.8	21.2	25.0	25.0
Effective Green, g (s)	25.6	78.7	78.7	18.3	71.4	71.4	29.0	32.8	32.8	21.2	25.0	25.0
Actuated g/C Ratio	0.14	0.44	0.44	0.10	0.40	0.40	0.16	0.18	0.18	0.12	0.14	0.14
Clearance Time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	4.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	486	1540	689	180	1404	626	553	645	287	404	492	219
v/s Ratio Prot	c0.11	c0.34		0.09	0.30		c0.16	c0.12		0.09	c0.13	
v/s Ratio Perm			0.26			0.05			0.02			0.05
v/c Ratio	0.76	0.78	0.60	0.88	0.77	0.13	1.00	0.67	0.11	0.76	0.96	0.39
Uniform Delay, d1	74.2	43.3	38.7	79.7	47.1	34.6	75.5	68.6	61.4	77.0	77.0	70.5
Progression Factor	1.00	1.00	1.00	1.06	0.91	1.36	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	4.0	3.8	28.2	3.1	0.3	38.3	2.8	0.2	8.4	30.8	1.1
Delay (s)	81.3	47.4	42.5	112.3	45.9	47.4	113.8	71.4	61.6	85.4	107.8	71.7
Level of Service	F	D	D	F	D	D	F	E	E	F	F	E
Approach Delay (s)		51.6			53.7			90.1			91.2	
Approach LOS		D			D			F			F	

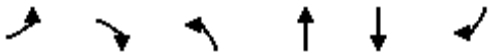
Intersection Summary			
HCM Average Control Delay	67.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	22	0	580	0	0	1	0	461	0	1	409	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			7.0		7.0		7.0	7.0	
Lane Util. Factor	0.97	0.95	0.95			1.00		0.95		1.00	0.95	
Frt	1.00	0.85	0.85			0.85		1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	1504	1504			1583		3539		1770	3539	
Flt Permitted	0.95	1.00	1.00			1.00		1.00		0.43	1.00	
Satd. Flow (perm)	3433	1504	1504			1583		3539		807	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	0	580	0	0	1	0	461	0	1	409	0
RTOR Reduction (vph)	0	250	250	0	0	1	0	0	0	0	0	0
Lane Group Flow (vph)	22	40	40	0	0	0	0	461	0	1	409	0
Turn Type	Split	NA	Prot	Prot		custom		NA	Perm	pm+pt	NA	
Protected Phases	4	4	4	3		3 5		6		5	2	
Permitted Phases									6	2		
Actuated Green, G (s)	18.1	18.1	18.1			5.9		78.0		75.2	75.2	
Effective Green, g (s)	18.1	18.1	18.1			5.9		78.0		75.2	75.2	
Actuated g/C Ratio	0.14	0.14	0.14			0.05		0.60		0.58	0.58	
Clearance Time (s)	7.0	7.0	7.0					7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)	478	209	209			72		2123		477	2047	
v/s Ratio Prot	0.01	c0.03	0.03			c0.00		c0.13		0.00	c0.12	
v/s Ratio Perm										0.00		
v/c Ratio	0.05	0.19	0.19			0.00		0.22		0.00	0.20	
Uniform Delay, d1	48.5	49.5	49.5			59.2		12.0		11.8	13.1	
Progression Factor	1.00	1.00	1.00			1.00		0.18		1.00	1.00	
Incremental Delay, d2	0.0	0.5	0.5			0.0		0.2		0.0	0.2	
Delay (s)	48.5	49.9	49.9			59.2		2.4		11.8	13.3	
Level of Service	D	D	D			E		A		B	B	
Approach Delay (s)		49.9			59.2			2.4			13.3	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	270	16	38	0	0	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.91
Frt	0.99		1.00			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1765		3539			5085
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	1765		3539			5085
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	270	16	38	0	0	361
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	286	0	38	0	0	361
Turn Type	NA		NA			NA
Protected Phases	4		6			2
Permitted Phases						
Actuated Green, G (s)	11.7		15.1			15.1
Effective Green, g (s)	11.7		15.1			15.1
Actuated g/C Ratio	0.29		0.37			0.37
Clearance Time (s)	7.0		7.0			7.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	506		1310			1882
v/s Ratio Prot	c0.16		0.01			c0.07
v/s Ratio Perm						
v/c Ratio	0.57		0.03			0.19
Uniform Delay, d1	12.4		8.2			8.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.5		0.0			0.0
Delay (s)	13.8		8.2			8.8
Level of Service	B		A			A
Approach Delay (s)	13.8		8.2			8.8
Approach LOS	B		A			A

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	40.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	659	91	19	793	814	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0	6.5	6.5	7.0
Lane Util. Factor	0.97		1.00	0.95	0.95	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	0.96		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3399		1770	3539	3539	1583
Flt Permitted	0.96		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3399		1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	659	91	19	793	814	36
RTOR Reduction (vph)	13	0	0	0	0	10
Lane Group Flow (vph)	737	0	19	793	814	26
Turn Type	NA		Prot	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases						6
Actuated Green, G (s)	20.9		3.0	50.6	40.6	61.5
Effective Green, g (s)	20.9		3.0	50.6	40.6	61.5
Actuated g/C Ratio	0.25		0.04	0.60	0.48	0.72
Clearance Time (s)	7.0		7.0	6.5	6.5	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	836		62	2107	1690	1145
v/s Ratio Prot	c0.22		0.01	c0.22	c0.23	0.01
v/s Ratio Perm						0.01
v/c Ratio	0.88		0.31	0.38	0.48	0.02
Uniform Delay, d1	30.9		40.0	9.0	15.1	3.3
Progression Factor	1.00		1.00	1.00	0.92	0.14
Incremental Delay, d2	10.8		2.8	0.5	1.0	0.0
Delay (s)	41.7		42.8	9.5	14.8	0.5
Level of Service	D		D	A	B	A
Approach Delay (s)	41.7			10.3	14.2	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

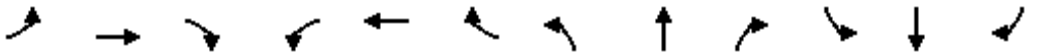
Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBR	
Lane Group Flow (vph)	96	133	243	652	2030	156	1469	754
v/c Ratio	0.76	0.09	0.84	0.63	0.84	0.79	0.65	0.48
Control Delay	115.9	0.1	88.0	25.9	25.2	104.1	21.7	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.9	0.1	88.0	25.9	25.2	104.1	21.7	1.0
Queue Length 50th (ft)	114	0	265	147	800	181	560	0
Queue Length 95th (ft)	#210	0	m335	m203	682	#281	633	0
Internal Link Dist (ft)	610				1235		338	
Turn Bay Length (ft)		270		365		390		
Base Capacity (vph)	130	1530	313	1031	2428	216	2277	1584
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.09	0.78	0.63	0.84	0.72	0.65	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	96	133	243	0	652	0	1916	114	156	1469	754
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			3%			1%			-4%	
Total Lost time (s)		7.0	4.0	7.0		7.0		7.0		7.0	7.0	4.0
Lane Util. Factor		1.00	1.00	1.00		0.88		0.91		1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85		0.99		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)		1800	1530	1710		2692		4921		1770	3541	1584
Flt Permitted		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)		1800	1530	1710		2692		4921		1770	3541	1584
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	96	133	243	0	652	0	1916	114	156	1469	754
RTOR Reduction (vph)	0	0	0	0	0	179	0	4	0	0	0	0
Lane Group Flow (vph)	0	96	133	243	0	473	0	2026	0	156	1469	754
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Free	Prot		custom		NA		Prot	NA	Free
Protected Phases		3		4		4 1		2		1	6	
Permitted Phases			Free									Free
Actuated Green, G (s)		12.6	180.0	30.6		57.7		88.7		20.1	115.8	180.0
Effective Green, g (s)		12.6	180.0	30.6		57.7		88.7		20.1	115.8	180.0
Actuated g/C Ratio		0.07	1.00	0.17		0.32		0.49		0.11	0.64	1.00
Clearance Time (s)		7.0		7.0				7.0		7.0	7.0	
Vehicle Extension (s)		4.0		4.0				5.0		4.0	5.0	
Lane Grp Cap (vph)		126	1530	290		862		2424		197	2278	1584
v/s Ratio Prot		c0.05		c0.14		0.18		c0.41		c0.09	0.41	
v/s Ratio Perm			0.09									0.48
v/c Ratio		0.76	0.09	0.84		0.55		0.84		0.79	0.64	0.48
Uniform Delay, d1		82.2	0.0	72.3		50.4		39.4		77.9	19.6	0.0
Progression Factor		1.00	1.00	0.94		0.81		0.57		1.00	1.00	1.00
Incremental Delay, d2		24.7	0.1	16.1		0.7		2.2		20.2	1.4	1.0
Delay (s)		106.9	0.1	84.3		41.5		24.6		98.1	21.0	1.0
Level of Service		F	A	F		D		C		F	C	A
Approach Delay (s)		44.9			53.1			24.6			19.7	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	9	117	28	10	126	21	1634	8	56	1563	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1720	1516	1752	3505	1562	1752	3498	1462
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.05	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1720	1516	101	3505	1562	78	3498	1462
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	305	9	117	28	10	126	21	1634	8	56	1563	87
RTOR Reduction (vph)	0	0	89	0	0	120	0	0	2	0	0	19
Lane Group Flow (vph)	305	9	28	0	38	6	21	1634	6	56	1563	68
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	43.1	43.1	43.1		9.1	9.1	96.6	92.3	92.3	102.0	95.0	95.0
Effective Green, g (s)	43.1	43.1	43.1		9.1	9.1	96.6	92.3	92.3	102.0	95.0	95.0
Actuated g/C Ratio	0.24	0.24	0.24		0.05	0.05	0.54	0.51	0.51	0.57	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	389	433	361		87	77	94	1797	801	109	1846	772
v/s Ratio Prot	c0.19	0.00			c0.02		0.01	c0.47		c0.02	c0.45	
v/s Ratio Perm			0.02			0.00	0.12		0.00	0.27		0.05
v/c Ratio	0.78	0.02	0.08		0.44	0.08	0.22	0.91	0.01	0.51	0.85	0.09
Uniform Delay, d1	64.1	52.3	53.0		83.0	81.5	30.8	40.0	21.4	36.0	36.3	21.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.80	0.73	0.62	1.31	0.75	0.53
Incremental Delay, d2	12.9	0.1	0.3		3.5	0.5	1.0	6.9	0.0	3.5	4.3	0.2
Delay (s)	77.0	52.4	53.4		86.4	81.9	25.6	35.9	13.2	50.8	31.7	11.3
Level of Service	E	D	D		F	F	C	D	B	D	C	B
Approach Delay (s)		70.1			83.0			35.7			31.3	
Approach LOS		E			F			D			C	

Intersection Summary			
HCM Average Control Delay	39.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	102	98	1594	82	36	1647
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		4%			-1%
Total Lost time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1388	1242	3402	1522	1744	3489
Flt Permitted	0.95	1.00	1.00	1.00	0.11	1.00
Satd. Flow (perm)	1388	1242	3402	1522	206	3489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	102	98	1594	82	36	1647
RTOR Reduction (vph)	0	87	0	21	0	0
Lane Group Flow (vph)	102	11	1594	61	36	1647
Heavy Vehicles (%)	30%	30%	4%	4%	4%	4%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	20.4	20.4	133.9	133.9	146.1	146.1
Effective Green, g (s)	20.4	20.4	133.9	133.9	146.1	146.1
Actuated g/C Ratio	0.11	0.11	0.74	0.74	0.81	0.81
Clearance Time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Vehicle Extension (s)	5.0	5.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	157	141	2531	1132	212	2832
v/s Ratio Prot	c0.07		c0.47		0.00	c0.47
v/s Ratio Perm		0.01		0.04	0.13	
v/c Ratio	0.65	0.08	0.63	0.05	0.17	0.58
Uniform Delay, d1	76.4	71.4	11.1	6.1	8.5	6.0
Progression Factor	1.00	1.00	1.00	1.00	0.12	0.26
Incremental Delay, d2	12.0	0.5	1.2	0.1	0.2	0.5
Delay (s)	88.4	71.9	12.3	6.2	1.3	2.1
Level of Service	F	E	B	A	A	A
Approach Delay (s)	80.3		12.0			2.1
Approach LOS	F		B			A

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	665	40	29	480	104	22	51	27	256	87	191
Ideal Flow (vphpl)	2000	1900	1900	1900	2000	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			4%			-3%	
Total Lost time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1835	1819		1787	1980	1599		1798	1552	1796	1891	1607
Flt Permitted	0.29	1.00		0.27	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	558	1819		504	1980	1599		1798	1552	1796	1891	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	665	40	29	480	104	22	51	27	256	87	191
RTOR Reduction (vph)	0	1	0	0	0	50	0	0	25	0	0	0
Lane Group Flow (vph)	350	704	0	29	480	55	0	73	2	256	87	191
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2			3			4
Actuated Green, G (s)	93.5	82.5		71.5	67.5	67.5		11.2	11.2	24.8	24.8	24.8
Effective Green, g (s)	93.5	82.5		71.5	67.5	67.5		11.2	11.2	24.8	24.8	24.8
Actuated g/C Ratio	0.62	0.55		0.48	0.45	0.45		0.07	0.07	0.17	0.17	0.17
Clearance Time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	510	1000		274	891	720		134	116	297	313	266
v/s Ratio Prot	c0.09	c0.39		0.00	0.24			c0.04		c0.14	0.05	
v/s Ratio Perm	0.34			0.05		0.03			0.00			0.12
v/c Ratio	0.69	0.70		0.11	0.54	0.08		0.54	0.02	0.86	0.28	0.72
Uniform Delay, d1	18.1	24.8		22.6	29.9	23.5		66.9	64.3	60.9	54.8	59.3
Progression Factor	1.52	0.53		1.00	1.00	1.00		1.00	1.00	0.67	0.61	0.66
Incremental Delay, d2	3.4	4.1		0.1	2.3	0.2		4.5	0.1	21.2	0.5	8.7
Delay (s)	30.9	17.2		22.7	32.3	23.7		71.4	64.4	62.3	34.0	47.7
Level of Service	C	B		C	C	C		E	E	E	C	D
Approach Delay (s)		21.7			30.4			69.5			52.5	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	33.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

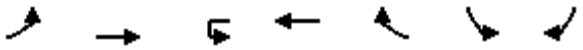
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	768	28	6	925	1	359	0	61	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1752	3504	1567	1787	3574			1770	1583		1695	
Flt Permitted	0.25	1.00	1.00	0.31	1.00			0.76	1.00		0.91	
Satd. Flow (perm)	457	3504	1567	586	3574			1409	1583		1576	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	768	28	6	925	1	359	0	61	1	0	1
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	44	0	1	0
Lane Group Flow (vph)	8	768	16	6	926	0	0	359	17	0	1	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4		4	8		
Actuated Green, G (s)	88.0	86.7	86.7	88.0	86.7			41.5	41.5		41.5	
Effective Green, g (s)	88.0	86.7	86.7	88.0	86.7			41.5	41.5		41.5	
Actuated g/C Ratio	0.59	0.58	0.58	0.59	0.58			0.28	0.28		0.28	
Clearance Time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0		7.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	279	2025	906	354	2066			390	438		436	
v/s Ratio Prot	c0.00	0.22		0.00	c0.26							
v/s Ratio Perm	0.02		0.01	0.01				c0.25	0.01		0.00	
v/c Ratio	0.03	0.38	0.02	0.02	0.45			0.92	0.04		0.00	
Uniform Delay, d1	13.8	17.1	13.5	13.3	18.0			52.6	39.7		39.3	
Progression Factor	0.76	0.72	0.62	1.05	1.01			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.5	0.0	0.0	0.7			26.7	0.0		0.0	
Delay (s)	10.5	12.9	8.4	14.0	18.9			79.3	39.7		39.3	
Level of Service	B	B	A	B	B			E	D		D	
Approach Delay (s)		12.7			18.9			73.6			39.3	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	326	422	10	81	802	256	64	478	263	101	161	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-5%			-3%			-4%	
Total Lost time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3364	3468	1552	3519	3628	1623	1832	3664	1639	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.65	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	3364	3468	1552	3519	3628	1623	1254	3664	1639	469	3610	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	326	422	10	81	802	256	64	478	263	101	161	448
RTOR Reduction (vph)	0	0	5	0	0	41	0	0	197	0	0	112
Lane Group Flow (vph)	326	422	5	81	802	215	64	478	66	101	161	336
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	19.7	72.1	79.8	9.0	61.4	72.5	36.5	28.8	37.8	43.3	32.2	51.9
Effective Green, g (s)	19.7	72.1	79.8	9.0	61.4	72.5	36.5	28.8	37.8	43.3	32.2	51.9
Actuated g/C Ratio	0.13	0.48	0.53	0.06	0.41	0.48	0.24	0.19	0.25	0.29	0.21	0.35
Clearance Time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	442	1667	826	211	1485	784	335	703	413	234	775	559
v/s Ratio Prot	c0.10	0.12	0.00	0.02	c0.22	0.02	0.01	c0.13	0.01	c0.03	0.04	c0.08
v/s Ratio Perm			0.00			0.11	0.04		0.03	0.09		0.13
v/c Ratio	0.74	0.25	0.01	0.38	0.54	0.27	0.19	0.68	0.16	0.43	0.21	0.60
Uniform Delay, d1	62.7	23.0	16.5	67.8	33.6	23.1	44.5	56.3	43.7	41.1	48.4	40.5
Progression Factor	1.00	1.00	1.00	1.15	0.64	0.67	1.00	1.00	1.00	1.02	0.87	0.44
Incremental Delay, d2	6.3	0.4	0.0	1.0	1.2	0.2	0.3	2.6	0.2	1.2	0.1	1.7
Delay (s)	69.0	23.4	16.5	79.0	22.8	15.6	44.8	58.9	43.9	43.0	42.1	19.5
Level of Service	E	C	B	E	C	B	D	E	D	D	D	B
Approach Delay (s)		42.9			25.2			52.9			28.0	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	36.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	76	596	2	1062	155	150	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%		-1%		-6%	
Total Lost time (s)	7.0	6.5	7.0	6.5		7.0	
Lane Util. Factor	1.00	0.95	1.00	0.95		1.00	
Frt	1.00	1.00	1.00	0.98		0.98	
Flt Protected	0.95	1.00	0.95	1.00		0.96	
Satd. Flow (prot)	1744	3480	1761	3455		1833	
Flt Permitted	0.12	1.00	0.95	1.00		0.96	
Satd. Flow (perm)	228	3480	1761	3455		1833	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	76	596	2	1062	155	150	34
RTOR Reduction (vph)	0	0	0	7	0	6	0
Lane Group Flow (vph)	76	596	2	1210	0	178	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	0%	0%
Bus Blockages (#/hr)	0	1	0	0	0	0	0
Turn Type	pm+pt	NA	Prot	NA		NA	
Protected Phases	5	2	1	6		3	
Permitted Phases	2						
Actuated Green, G (s)	49.6	44.4	0.8	40.0		15.2	
Effective Green, g (s)	49.6	44.4	0.8	40.0		15.2	
Actuated g/C Ratio	0.61	0.55	0.01	0.49		0.19	
Clearance Time (s)	7.0	6.5	7.0	6.5		7.0	
Vehicle Extension (s)	2.5	3.0	2.0	3.0		3.0	
Lane Grp Cap (vph)	237	1910	17	1708		344	
v/s Ratio Prot	c0.02	0.17	0.00	c0.35		c0.10	
v/s Ratio Perm	c0.18						
v/c Ratio	0.32	0.31	0.12	0.71		0.52	
Uniform Delay, d1	9.5	9.9	39.7	15.9		29.6	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.1	1.1	1.4		1.3	
Delay (s)	10.1	10.0	40.8	17.3		30.9	
Level of Service	B	B	D	B		C	
Approach Delay (s)		10.0		17.3		30.9	
Approach LOS		B		B		C	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	27.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	427	31	138	1190	0	0	0	0	184	1	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050
Grade (%)		2%			-2%			0%			3%	
Total Lost time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	1.00
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5034	1567	1787	3575					1656	1661	1980
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5034	1567	1787	3575					1656	1661	1980
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	427	31	138	1190	0	0	0	0	184	1	590
RTOR Reduction (vph)	0	0	22	0	0	0	0	0	0	0	0	55
Lane Group Flow (vph)	0	427	9	138	1190	0	0	0	0	92	93	535
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			2									
Actuated Green, G (s)		29.5	29.5	23.0	59.5					27.0	27.0	27.0
Effective Green, g (s)		29.5	29.5	23.0	59.5					27.0	27.0	27.0
Actuated g/C Ratio		0.29	0.29	0.23	0.60					0.27	0.27	0.27
Clearance Time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Vehicle Extension (s)		5.0	5.0	3.5	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1485	462	411	2127					447	448	535
v/s Ratio Prot		0.08		0.08	c0.33					0.06	0.06	c0.27
v/s Ratio Perm			0.01									
v/c Ratio		0.29	0.02	0.34	0.56					0.21	0.21	1.00
Uniform Delay, d1		27.2	25.0	32.1	12.3					28.2	28.2	36.5
Progression Factor		1.00	1.00	0.72	0.53					1.00	1.00	1.00
Incremental Delay, d2		0.5	0.1	1.7	0.8					0.2	0.2	38.4
Delay (s)		27.6	25.1	24.8	7.3					28.4	28.5	74.9
Level of Service		C	C	C	A					C	C	E
Approach Delay (s)		27.5			9.2			0.0			63.8	
Approach LOS		C			A			A			E	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

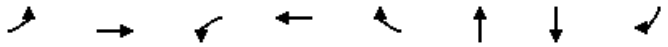
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	491	0	0	1031	87	307	28	198	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			0%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3399	3504			3575	1599		1763	1567			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3399	3504			3575	1599		1763	1567			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	491	0	0	1031	87	307	28	198	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	0	0	0	0
Lane Group Flow (vph)	119	491	0	0	1031	40	0	335	198	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	5	2			6		4	4	4			
Permitted Phases						6						
Actuated Green, G (s)	10.6	63.2			45.6	45.6		23.3	23.3			
Effective Green, g (s)	10.6	63.2			45.6	45.6		23.3	23.3			
Actuated g/C Ratio	0.11	0.63			0.46	0.46		0.23	0.23			
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Vehicle Extension (s)	4.0	5.0			5.0	5.0		3.0	3.0			
Lane Grp Cap (vph)	360	2215			1630	729		411	365			
v/s Ratio Prot	c0.04	0.14			c0.29			c0.19	0.13			
v/s Ratio Perm						0.02						
v/c Ratio	0.33	0.22			0.63	0.05		0.82	0.54			
Uniform Delay, d1	41.4	7.9			20.8	15.2		36.3	33.7			
Progression Factor	0.61	2.13			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.7	0.2			1.9	0.1		11.8	1.6			
Delay (s)	26.1	17.0			22.7	15.3		48.1	35.3			
Level of Service	C	B			C	B		D	D			
Approach Delay (s)		18.8			22.1			43.3			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	10	23	567	3	1012	2	714	51	266	938	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.90		1.00	0.87	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1684		1732	1506	1550	1752	3504	1567	3399	3504	1567
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1684		1732	1506	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	18	10	23	567	3	1012	2	714	51	266	938	3
RTOR Reduction (vph)	0	22	0	0	131	127	0	0	35	0	0	2
Lane Group Flow (vph)	18	11	0	510	405	409	2	714	16	266	938	1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	6.0	6.0		55.8	55.8	77.8	1.1	51.1	51.1	22.0	72.0	72.0
Effective Green, g (s)	6.0	6.0		55.8	55.8	77.8	1.1	51.1	51.1	22.0	72.0	72.0
Actuated g/C Ratio	0.04	0.04		0.34	0.34	0.48	0.01	0.31	0.31	0.14	0.44	0.44
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	66	62		593	516	807	12	1099	492	459	1549	693
v/s Ratio Prot	c0.01	0.01		c0.29	0.27	c0.07	0.00	c0.20		0.08	c0.27	
v/s Ratio Perm						0.20			0.01			0.00
v/c Ratio	0.27	0.17		0.86	0.78	0.51	0.17	0.65	0.03	0.58	0.61	0.00
Uniform Delay, d1	76.3	76.1		49.9	48.1	29.3	80.4	48.2	38.8	66.1	34.6	25.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	1.3		12.1	7.7	0.7	6.5	1.8	0.1	2.1	1.0	0.0
Delay (s)	78.6	77.4		62.0	55.8	30.0	86.9	50.0	38.8	68.2	35.6	25.4
Level of Service	E	E		E	E	C	F	D	D	E	D	C
Approach Delay (s)		77.8			49.1			49.4			42.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	47.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	162.9	Sum of lost time (s)	28.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	48	787	7	1524	245	16	233	525
v/c Ratio	0.45	0.23	0.09	0.49	0.23	0.18	0.76	0.74
Control Delay	78.6	10.5	70.9	20.2	4.3	44.9	74.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	78.6	10.5	70.9	20.2	4.3	44.9	74.5	11.1
Queue Length 50th (ft)	50	44	7	279	10	6	220	0
Queue Length 95th (ft)	m68	201	24	468	66	32	297	109
Internal Link Dist (ft)		452		967		434	631	
Turn Bay Length (ft)	250		255		360			175
Base Capacity (vph)	119	3468	82	3088	1046	422	437	785
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	30
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.23	0.09	0.49	0.23	0.04	0.53	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	783	4	7	1524	245	5	1	10	232	1	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			0%			0%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (prot)	1787	5132		1770	5085	1583		1679			1774	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (perm)	1787	5132		1770	5085	1583		1679			1774	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	783	4	7	1524	245	5	1	10	232	1	525
RTOR Reduction (vph)	0	0	0	0	0	93	0	10	0	0	0	434
Lane Group Flow (vph)	48	787	0	7	1524	152	0	6	0	0	233	91
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases						2						3
Actuated Green, G (s)	7.5	91.6		1.4	85.5	85.5		3.1			25.9	25.9
Effective Green, g (s)	7.5	91.6		1.4	85.5	85.5		3.1			25.9	25.9
Actuated g/C Ratio	0.05	0.61		0.01	0.57	0.57		0.02			0.17	0.17
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0			3.0	3.0
Lane Grp Cap (vph)	89	3133		16	2898	902		34			306	273
v/s Ratio Prot	c0.03	c0.15		0.00	c0.30			c0.00			c0.13	
v/s Ratio Perm						0.10						0.06
v/c Ratio	0.54	0.25		0.44	0.53	0.17		0.18			0.76	0.33
Uniform Delay, d1	69.6	13.4		73.9	19.8	15.3		72.2			59.1	54.5
Progression Factor	0.98	0.88		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	5.4	0.2		18.0	0.7	0.4		2.6			10.7	0.7
Delay (s)	73.5	12.0		91.9	20.5	15.7		74.8			69.8	55.2
Level of Service	E	B		F	C	B		E			E	E
Approach Delay (s)		15.6			20.1			74.8			59.7	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	236	700	13	251	1702	31	43	55	57	58	100
v/c Ratio	0.51	0.68	0.03	0.32	0.65	0.04	0.35	0.36	0.34	0.35	0.36
Control Delay	71.2	63.5	0.2	24.3	22.9	2.1	83.1	40.1	75.3	75.3	7.4
Queue Delay	0.0	0.0	0.0	2.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	63.5	0.2	26.5	23.2	2.1	83.1	40.1	75.3	75.3	7.4
Queue Length 50th (ft)	125	261	0	167	463	1	46	20	62	63	0
Queue Length 95th (ft)	183	315	0	284	582	12	94	71	116	118	27
Internal Link Dist (ft)		967			196			671		824	
Turn Bay Length (ft)	500		200						430		430
Base Capacity (vph)	466	2084	703	786	2789	909	398	406	480	485	546
Starvation Cap Reductn	0	0	0	399	402	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.34	0.02	0.65	0.71	0.03	0.11	0.14	0.12	0.12	0.18

Intersection Summary

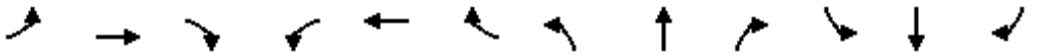
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	236	700	13	251	1702	31	43	19	36	106	9	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			0%			-3%	
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3467	5136	1599	1752	5034	1567	1770	1680		1706	1723	1607
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3467	5136	1599	1752	5034	1567	1770	1680		1706	1723	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	236	700	13	251	1702	31	43	19	36	106	9	100
RTOR Reduction (vph)	0	0	10	0	0	15	0	33	0	0	0	90
Lane Group Flow (vph)	236	700	3	251	1702	16	43	22	0	57	58	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		8	8		3	3	
Permitted Phases			6			2						3
Actuated Green, G (s)	21.5	32.4	32.4	72.3	83.2	83.2	11.3	11.3		15.8	15.8	15.8
Effective Green, g (s)	21.5	32.4	32.4	72.3	83.2	83.2	11.3	11.3		15.8	15.8	15.8
Actuated g/C Ratio	0.13	0.20	0.20	0.45	0.52	0.52	0.07	0.07		0.10	0.10	0.10
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.5	3.0	3.0	3.0	3.0	3.0	4.0	4.0		3.0	3.0	3.0
Lane Grp Cap (vph)	463	1034	322	787	2604	810	124	118		167	169	157
v/s Ratio Prot	0.07	c0.14		0.14	c0.34		c0.02	0.01		0.03	c0.03	
v/s Ratio Perm			0.00			0.01						0.01
v/c Ratio	0.51	0.68	0.01	0.32	0.65	0.02	0.35	0.18		0.34	0.34	0.06
Uniform Delay, d1	64.8	59.4	51.3	28.4	28.3	18.9	71.2	70.4		67.6	67.7	65.8
Progression Factor	1.00	1.00	1.00	0.76	0.75	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	1.8	0.0	0.2	0.6	0.0	2.3	1.0		1.2	1.2	0.2
Delay (s)	65.8	61.1	51.4	21.8	21.9	18.9	73.5	71.4		68.9	68.9	65.9
Level of Service	E	E	D	C	C	B	E	E		E	E	E
Approach Delay (s)		62.2			21.8			72.3			67.5	
Approach LOS		E			C			E			E	

Intersection Summary					
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	160.8	Sum of lost time (s)	29.0		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C		
Analysis Period (min)	15				

c Critical Lane Group

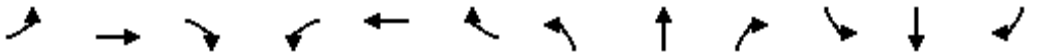
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	224	15	18	670	27	2343	925
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.91	1.00	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	1770	5085	1583
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	224	15	18	670	27	2343	925
RTOR Reduction (vph)	0	7	0	0	0	0	139
Lane Group Flow (vph)	224	8	18	670	27	2343	786
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	18.5	23.7	5.2	152.3	7.2	154.3	154.3
Effective Green, g (s)	18.5	23.7	5.2	152.3	7.2	154.3	154.3
Actuated g/C Ratio	0.09	0.12	0.03	0.76	0.04	0.77	0.77
Clearance Time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	318	188	46	3872	64	3923	1221
v/s Ratio Prot	c0.07	0.00	0.01	0.13	c0.02	0.46	
v/s Ratio Perm		0.00					c0.50
v/c Ratio	0.70	0.04	0.39	0.17	0.42	0.60	0.64
Uniform Delay, d1	88.1	78.1	95.8	6.6	94.4	9.7	10.4
Progression Factor	1.00	1.00	1.15	0.18	1.00	1.00	1.00
Incremental Delay, d2	6.9	0.1	5.3	0.1	4.4	0.7	2.6
Delay (s)	95.0	78.2	115.4	1.2	98.8	10.4	13.0
Level of Service	F	E	F	A	F	B	B
Approach Delay (s)	94.0			4.2		11.8	
Approach LOS	F			A		B	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



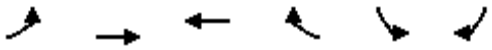
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	776	1	1	2991	313	0	0	0	135	1	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.5				7.5	7.5	7.0
Lane Util. Factor	0.97	0.91		1.00	0.86	1.00				0.95	0.91	0.95
Frt	1.00	1.00		1.00	1.00	0.85				1.00	0.87	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	0.99	1.00
Satd. Flow (prot)	3433	5084		1770	6408	1583				1681	1467	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00				0.95	0.99	1.00
Satd. Flow (perm)	3433	5084		1770	6408	1583				1681	1467	1504
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	121	776	1	1	2991	313	0	0	0	135	1	210
RTOR Reduction (vph)	0	0	0	0	0	58	0	0	0	0	89	93
Lane Group Flow (vph)	121	777	0	1	2991	255	0	0	0	120	26	19
Turn Type	Prot	NA		Prot	NA	pm+ov	Split			Split	NA	pm+ov
Protected Phases	1	6		5	2	4	3	3		4	4	1
Permitted Phases						2						4
Actuated Green, G (s)	11.7	139.0		1.2	128.5	146.8				18.3	18.3	30.0
Effective Green, g (s)	11.7	139.0		1.2	128.5	146.8				18.3	18.3	30.0
Actuated g/C Ratio	0.06	0.77		0.01	0.71	0.82				0.10	0.10	0.17
Clearance Time (s)	7.0	7.0		7.0	7.0	7.5				7.5	7.5	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	223	3926		12	4575	1291				171	149	251
v/s Ratio Prot	c0.04	0.15		0.00	c0.47	0.02				c0.07	0.02	0.00
v/s Ratio Perm						0.14						0.01
v/c Ratio	0.54	0.20		0.08	0.65	0.20				0.70	0.17	0.07
Uniform Delay, d1	81.6	5.5		88.9	13.8	3.7				78.2	73.9	63.3
Progression Factor	1.00	1.00		1.00	0.38	0.59				1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		2.2	0.6	0.1				12.3	0.6	0.1
Delay (s)	84.2	5.6		90.7	5.8	2.2				90.5	74.5	63.4
Level of Service	F	A		F	A	A				F	E	E
Approach Delay (s)		16.2			5.5			0.0			76.5	
Approach LOS		B			A			A			E	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



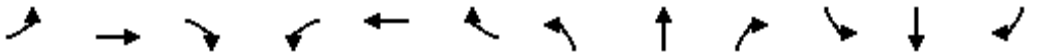
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	235	647	27	128	2170	31	16	20	14	68	232	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.91		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	0.76
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5055		1770	6408	1583	1770	1863	1583	3433	1863	3610
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5055		1770	6408	1583	1770	1863	1583	3433	1863	3610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	235	647	27	128	2170	31	16	20	14	68	232	1039
RTOR Reduction (vph)	0	2	0	0	0	9	0	0	13	0	0	257
Lane Group Flow (vph)	235	672	0	128	2170	22	16	20	1	68	232	782
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	pt+ov
Protected Phases	1	6		5	2	8	7	7		8	8	8 1
Permitted Phases						2			7			
Actuated Green, G (s)	16.5	90.3		16.4	90.2	128.3	7.2	7.2	7.2	38.1	38.1	61.6
Effective Green, g (s)	16.5	90.3		16.4	90.2	128.3	7.2	7.2	7.2	38.1	38.1	61.6
Actuated g/C Ratio	0.09	0.50		0.09	0.50	0.71	0.04	0.04	0.04	0.21	0.21	0.34
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	315	2536		161	3211	1128	71	75	63	727	394	1235
v/s Ratio Prot	0.07	0.13		c0.07	c0.34	0.00	0.01	c0.01		0.02	0.12	c0.22
v/s Ratio Perm						0.01			0.00			
v/c Ratio	0.75	0.26		0.80	0.68	0.02	0.23	0.27	0.01	0.09	0.59	0.63
Uniform Delay, d1	79.7	25.8		80.2	33.9	7.5	83.7	83.8	83.0	57.1	63.9	49.7
Progression Factor	1.00	0.98		1.23	0.67	1.16	1.00	1.00	1.00	1.11	1.07	0.80
Incremental Delay, d2	9.2	0.3		11.2	0.5	0.0	2.2	2.6	0.1	0.1	2.2	1.0
Delay (s)	89.0	25.5		110.0	23.4	8.8	85.9	86.4	83.1	63.4	70.6	41.0
Level of Service	F	C		F	C	A	F	F	F	E	E	D
Approach Delay (s)		41.9			27.9			85.3			47.2	
Approach LOS		D			C			F			D	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	28	652	1701	610	825	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2000
Total Lost time (s)	7.0	7.5	7.5	4.0	7.5	7.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	3539	3539	1583	3433	1667
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	3539	3539	1583	3433	1667
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	652	1701	610	825	600
RTOR Reduction (vph)	0	0	0	0	0	8
Lane Group Flow (vph)	28	652	1701	610	825	592
Turn Type	Prot	NA	NA	Free	NA	pt+ov
Protected Phases	1	6	2		4	4 1
Permitted Phases				Free		
Actuated Green, G (s)	5.8	112.5	99.7	180.0	52.5	65.8
Effective Green, g (s)	5.8	112.5	99.7	180.0	52.5	65.8
Actuated g/C Ratio	0.03	0.62	0.55	1.00	0.29	0.37
Clearance Time (s)	7.0	7.5	7.5		7.5	
Vehicle Extension (s)	3.0	5.0	5.0		3.5	
Lane Grp Cap (vph)	111	2212	1960	1583	1001	609
v/s Ratio Prot	0.01	0.18	c0.48		0.24	c0.36
v/s Ratio Perm				0.39		
v/c Ratio	0.25	0.29	0.87	0.39	0.82	0.97
Uniform Delay, d1	85.0	15.5	34.5	0.0	59.4	56.2
Progression Factor	1.13	0.82	0.76	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.3	3.2	0.4	5.8	29.4
Delay (s)	97.2	13.0	29.6	0.4	65.2	85.6
Level of Service	F	B	C	A	E	F
Approach Delay (s)		16.5	21.9		73.8	
Approach LOS		B	C		E	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	1264	214	40	1554	79	758	27	16	85	10	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2050	2050	2050	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	7.0	7.5	7.5	7.0	7.5		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.91	0.91		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1577	1770	3514		1737	3481		1593	1676	1478
Flt Permitted	0.04	1.00	1.00	0.10	1.00		0.95	0.96		0.95	1.00	1.00
Satd. Flow (perm)	83	3539	1577	192	3514		1737	3481		1593	1676	1478
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	1264	214	40	1554	79	758	27	16	85	10	13
RTOR Reduction (vph)	0	0	66	0	2	0	0	2	0	0	0	12
Lane Group Flow (vph)	4	1264	149	40	1631	0	379	420	0	85	10	1
Bus Blockages (#/hr)	0	0	1	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases	2		2	6								3
Actuated Green, G (s)	91.4	90.0	90.0	102.6	95.6		39.5	39.5		15.0	15.0	15.0
Effective Green, g (s)	91.4	90.0	90.0	102.6	95.6		39.5	39.5		15.0	15.0	15.0
Actuated g/C Ratio	0.51	0.50	0.50	0.57	0.53		0.22	0.22		0.08	0.08	0.08
Clearance Time (s)	7.0	7.5	7.5	7.0	7.5		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	55	1770	789	171	1866		381	764		133	140	123
v/s Ratio Prot	0.00	0.36		c0.01	c0.46		c0.22	0.12		c0.05	0.01	
v/s Ratio Perm	0.04		0.09	0.12								0.00
v/c Ratio	0.07	0.71	0.19	0.23	0.87		0.99	0.95dl		0.64	0.07	0.01
Uniform Delay, d1	33.4	35.0	24.8	25.0	36.9		70.1	62.4		79.9	76.1	75.7
Progression Factor	0.61	0.91	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	2.0	0.4	1.0	6.1		44.5	1.1		10.8	0.3	0.0
Delay (s)	21.1	34.0	24.8	26.0	43.0		114.6	63.4		90.7	76.4	75.7
Level of Service	C	C	C	C	D		F	E		F	E	E
Approach Delay (s)		32.6			42.6			87.7			87.6	
Approach LOS		C			D			F			F	

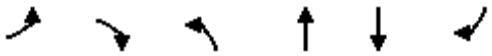
Intersection Summary			
HCM Average Control Delay	49.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	477	346	1142	86	77	1337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.19	1.00
Satd. Flow (perm)	3433	1583	3539	1583	350	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	477	346	1142	86	77	1337
RTOR Reduction (vph)	0	202	0	29	0	0
Lane Group Flow (vph)	477	144	1142	57	77	1337
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	30.1	30.1	111.8	111.8	126.4	126.4
Effective Green, g (s)	30.1	30.1	111.8	111.8	126.4	126.4
Actuated g/C Ratio	0.18	0.18	0.66	0.66	0.74	0.74
Clearance Time (s)	6.5	6.5	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	6.0	6.0	3.0	6.0
Lane Grp Cap (vph)	608	280	2327	1041	324	2631
v/s Ratio Prot	c0.14		0.32		0.01	c0.38
v/s Ratio Perm		0.09		0.04	0.17	
v/c Ratio	0.78	0.52	0.49	0.05	0.24	0.51
Uniform Delay, d1	66.9	63.3	14.7	10.3	8.8	9.0
Progression Factor	1.00	1.00	1.00	1.00	0.98	0.66
Incremental Delay, d2	6.6	1.6	0.7	0.1	0.3	0.6
Delay (s)	73.4	65.0	15.5	10.4	9.0	6.6
Level of Service	E	E	B	B	A	A
Approach Delay (s)	69.9		15.1			6.7
Approach LOS	E		B			A

Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	3	2	3	1527	1527	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			-3%	4%	
Total Lost time (s)	7.0	7.0	7.0	6.5	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1796	3592	3468	1552
Flt Permitted	0.95	1.00	0.15	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	279	3592	3468	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	2	3	1527	1527	1
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	3	0	3	1527	1527	1
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	1.4	1.4	155.1	155.1	146.7	146.7
Effective Green, g (s)	1.4	1.4	155.1	155.1	146.7	146.7
Actuated g/C Ratio	0.01	0.01	0.91	0.91	0.86	0.86
Clearance Time (s)	7.0	7.0	7.0	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	15	13	267	3277	2993	1339
v/s Ratio Prot	c0.00		0.00	c0.43	c0.44	
v/s Ratio Perm		0.00	0.01			0.00
v/c Ratio	0.20	0.00	0.01	0.47	0.51	0.00
Uniform Delay, d1	83.7	83.6	1.8	1.1	2.9	1.6
Progression Factor	1.00	1.00	0.70	1.09	0.91	0.24
Incremental Delay, d2	6.5	0.0	0.0	0.4	0.5	0.0
Delay (s)	90.2	83.6	1.2	1.7	3.1	0.4
Level of Service	F	F	A	A	A	A
Approach Delay (s)	87.6			1.6	3.1	
Approach LOS	F			A	A	

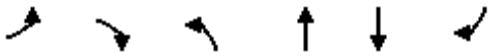
Intersection Summary			
HCM Average Control Delay	2.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL2	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	1201	305	53	957	24	309	73	108	31	55	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050	2050	2050
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0			8.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1696			1869	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1696			1869	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	141	1201	305	53	957	24	309	73	108	31	55	71
RTOR Reduction (vph)	0	0	194	0	0	14	0	0	0	0	0	0
Lane Group Flow (vph)	141	1201	111	53	957	10	309	181	0	0	157	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2 5		1	1 2		3	3		6	6	
Permitted Phases			2 5			1 2						
Actuated Green, G (s)	20.0	61.7	61.7	31.1	72.8	72.8	22.8	22.8			15.0	
Effective Green, g (s)	20.0	61.7	61.7	31.1	72.8	72.8	22.8	22.8			15.0	
Actuated g/C Ratio	0.12	0.36	0.36	0.18	0.43	0.43	0.13	0.13			0.09	
Clearance Time (s)	8.0			8.0			7.0	7.0			8.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	208	1284	575	324	1516	678	460	227			165	
v/s Ratio Prot	0.08	c0.34		0.03	c0.27		0.09	c0.11			c0.08	
v/s Ratio Perm			0.07			0.01						
v/c Ratio	0.68	0.94	0.19	0.16	0.63	0.02	0.67	0.80			0.95	
Uniform Delay, d1	71.9	52.2	37.1	58.5	38.1	28.0	70.0	71.4			77.1	
Progression Factor	0.85	0.79	0.20	0.67	0.45	0.27	1.00	1.00			1.00	
Incremental Delay, d2	7.9	11.9	0.2	0.2	0.7	0.0	3.8	17.4			55.5	
Delay (s)	69.3	53.1	7.7	39.2	17.7	7.7	73.9	88.8			132.7	
Level of Service	E	D	A	D	B	A	E	F			F	
Approach Delay (s)		46.1			18.5			79.4			132.7	
Approach LOS		D			B			E			F	

Intersection Summary			
HCM Average Control Delay	46.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	38.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SER	SER2
Lane Configurations			
Volume (vph)	1	1	1
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	7.0		
Lane Util. Factor	1.00		
Frt	0.91		
Flt Protected	0.98		
Satd. Flow (prot)	1667		
Flt Permitted	0.98		
Satd. Flow (perm)	1667		
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1	1	1
RTOR Reduction (vph)	1	0	0
Lane Group Flow (vph)	2	0	0
Turn Type	NA		
Protected Phases	4		
Permitted Phases			
Actuated Green, G (s)	1.4		
Effective Green, g (s)	1.4		
Actuated g/C Ratio	0.01		
Clearance Time (s)	7.0		
Vehicle Extension (s)	3.0		
Lane Grp Cap (vph)	14		
v/s Ratio Prot	c0.00		
v/s Ratio Perm			
v/c Ratio	0.14		
Uniform Delay, d1	83.7		
Progression Factor	1.00		
Incremental Delay, d2	4.7		
Delay (s)	88.4		
Level of Service	F		
Approach Delay (s)	88.4		
Approach LOS	F		
Intersection Summary			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	142	458	174	337	339	102
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	142	458	174	337	339	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1024	339	339			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1024	339	339			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	36	35	86			
cM capacity (veh/h)	224	703	1220			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	600	174	337	339	102
Volume Left	142	174	0	0	0
Volume Right	458	0	0	0	102
cSH	466	1220	1700	1700	1700
Volume to Capacity	1.29	0.14	0.20	0.20	0.06
Queue Length 95th (ft)	638	12	0	0	0
Control Delay (s)	170.0	8.4	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	170.0	2.9		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	66.7		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

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Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	900	725	60	150	80
v/c Ratio	0.44	0.46	0.15	0.06	0.11
Control Delay	12.5	1.0	4.3	3.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	1.0	4.3	3.4	5.4
Queue Length 50th (ft)	152	0	6	8	0
Queue Length 95th (ft)	205	0	14	14	14
Internal Link Dist (ft)	496			698	342
Turn Bay Length (ft)		250	200		
Base Capacity (vph)	2033	1583	441	2418	721
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.46	0.14	0.06	0.11

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	900	725	60	150	50	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3539	1583	1770	3539	3307	
Flt Permitted	1.00	1.00	0.24	1.00	0.97	
Satd. Flow (perm)	3539	1583	442	3539	3307	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	900	725	60	150	50	30
RTOR Reduction (vph)	0	0	0	0	64	0
Lane Group Flow (vph)	900	725	60	150	16	0
Turn Type	NA	Free	pm+pt	NA	NA	
Protected Phases	2		1	6	3	
Permitted Phases		Free	6			
Actuated Green, G (s)	50.6	90.0	61.5	61.5	17.5	
Effective Green, g (s)	50.6	90.0	61.5	61.5	17.5	
Actuated g/C Ratio	0.56	1.00	0.68	0.68	0.19	
Clearance Time (s)	5.5		5.5	5.5	5.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1989	1583	381	2418	643	
v/s Ratio Prot	0.25		0.01	0.04	0.00	
v/s Ratio Perm		c0.46	0.10			
v/c Ratio	0.45	0.46	0.16	0.06	0.02	
Uniform Delay, d1	11.6	0.0	5.9	4.7	29.3	
Progression Factor	1.00	1.00	0.74	0.71	1.00	
Incremental Delay, d2	0.7	1.0	0.2	0.0	0.1	
Delay (s)	12.3	1.0	4.5	3.4	29.4	
Level of Service	B	A	A	A	C	
Approach Delay (s)	7.2			3.7	29.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1075	325	475	225	40	30
v/c Ratio	0.86	0.42	0.94	0.09	0.07	0.08
Control Delay	30.5	4.2	59.5	4.4	31.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	4.2	59.5	4.4	31.2	0.5
Queue Length 50th (ft)	177	0	259	18	9	0
Queue Length 95th (ft)	#270	49	#444	28	23	0
Internal Link Dist (ft)	698			585	318	
Turn Bay Length (ft)		350	350		150	150
Base Capacity (vph)	1245	767	521	2477	610	361
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.42	0.91	0.09	0.07	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1075	325	475	225	40	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1075	325	475	225	40	30
RTOR Reduction (vph)	0	211	0	0	0	25
Lane Group Flow (vph)	1075	114	475	225	40	5
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	31.7	31.7	25.8	63.0	16.0	16.0
Effective Green, g (s)	31.7	31.7	25.8	63.0	16.0	16.0
Actuated g/C Ratio	0.35	0.35	0.29	0.70	0.18	0.18
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1246	557	507	2477	610	281
v/s Ratio Prot	c0.30		c0.27	0.06	c0.01	
v/s Ratio Perm		0.07				0.00
v/c Ratio	0.86	0.21	0.94	0.09	0.07	0.02
Uniform Delay, d1	27.1	20.4	31.3	4.3	30.8	30.5
Progression Factor	0.79	0.94	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.8	0.8	24.9	0.1	0.2	0.1
Delay (s)	29.3	20.0	56.2	4.4	31.0	30.6
Level of Service	C	C	E	A	C	C
Approach Delay (s)	27.2			39.6	30.8	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	875	80	275	150	10	50	550	425
v/c Ratio	0.33	0.93	0.76	0.28	0.27	0.03	0.06	0.83	0.46
Control Delay	47.3	48.6	84.9	26.7	5.2	11.6	6.5	34.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	48.6	84.9	26.7	5.2	11.6	6.5	34.2	9.8
Queue Length 50th (ft)	22	247	46	67	0	3	6	252	65
Queue Length 95th (ft)	54	#374	#125	102	39	11	23	#537	172
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	126	939	105	998	564	382	884	664	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.93	0.76	0.28	0.27	0.03	0.06	0.83	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	675	200	80	275	150	10	20	30	550	100	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.91		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	1695		1770	1649	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.35	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3418		1770	3539	1583	647	1695		1349	1649	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	675	200	80	275	150	10	20	30	550	100	325
RTOR Reduction (vph)	0	30	0	0	0	111	0	14	0	0	117	0
Lane Group Flow (vph)	40	845	0	80	275	39	10	36	0	550	308	0
Turn Type	Prot	NA		Prot	NA	Prot	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6	6	3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.7	24.4		4.1	24.8	24.8	49.6	49.6		43.3	43.3	
Effective Green, g (s)	3.7	24.4		4.1	24.8	24.8	49.6	49.6		43.3	43.3	
Actuated g/C Ratio	0.04	0.26		0.04	0.26	0.26	0.52	0.52		0.46	0.46	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	69	881		76	927	414	348	888		617	754	
v/s Ratio Prot	0.02	c0.25		c0.05	0.08	0.02	0.00	c0.02			0.19	
v/s Ratio Perm							0.01			c0.41		
v/c Ratio	0.58	0.96		1.05	0.30	0.09	0.03	0.04		0.89	0.41	
Uniform Delay, d1	44.7	34.6		45.2	27.9	26.4	12.1	10.9		23.5	17.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.3	21.8		118.4	0.8	0.5	0.0	0.1		17.6	1.6	
Delay (s)	56.0	56.4		163.7	28.7	26.9	12.1	11.0		41.1	18.8	
Level of Service	E	E		F	C	C	B	B		D	B	
Approach Delay (s)		56.4			49.6			11.2			31.4	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	94.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	10	1625	20	20	720
v/c Ratio	0.01	1.05	0.06	0.02	0.35
Control Delay	29.6	45.3	24.0	23.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	45.3	24.0	23.4	8.4
Queue Length 50th (ft)	2	~50	8	4	83
Queue Length 95th (ft)	10	#1226	25	13	115
Internal Link Dist (ft)	917			636	2135
Turn Bay Length (ft)		300	200		
Base Capacity (vph)	853	1541	345	1002	2080
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	1.05	0.06	0.02	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	10	1625	20	20	700	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	3539	1583	1770	3539	3432	
Flt Permitted	1.00	1.00	0.60	1.00	0.95	
Satd. Flow (perm)	3539	1583	1116	3539	3432	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	1625	20	20	700	20
RTOR Reduction (vph)	0	186	0	0	41	0
Lane Group Flow (vph)	10	1439	20	20	679	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	21.7	75.2	28.8	28.8	53.5	
Effective Green, g (s)	21.7	75.2	28.8	28.8	53.5	
Actuated g/C Ratio	0.23	0.81	0.31	0.31	0.57	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	823	1369	355	1092	1967	
v/s Ratio Prot	0.00	c0.60	c0.00	0.01	0.20	
v/s Ratio Perm		0.31	0.02			
v/c Ratio	0.01	1.05	0.06	0.02	0.35	
Uniform Delay, d1	27.6	9.0	22.7	22.4	10.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	39.1	0.1	0.0	0.1	
Delay (s)	27.6	48.1	22.8	22.5	10.7	
Level of Service	C	D	C	C	B	
Approach Delay (s)	48.0			22.6	10.7	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	93.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	113.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBL	SBR
Lane Group Flow (vph)	90	10	100	30	10
v/c Ratio	0.29	0.02	0.31	0.05	0.01
Control Delay	24.5	0.1	24.4	11.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	0.1	24.4	11.7	0.0
Queue Length 50th (ft)	24	0	26	6	0
Queue Length 95th (ft)	70	0	75	21	0
Internal Link Dist (ft)	468		451		
Turn Bay Length (ft)				180	180
Base Capacity (vph)	629	656	633	620	1195
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.02	0.16	0.05	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	80	10	0	100	0	30	0	0	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5		5.5					5.5
Lane Util. Factor		1.00	1.00		1.00		1.00					1.00
Frt		1.00	0.85		1.00		1.00					0.85
Flt Protected		0.99	1.00		1.00		0.95					1.00
Satd. Flow (prot)		1852	1583		1863		1770					1583
Flt Permitted		0.99	1.00		1.00		0.61					1.00
Satd. Flow (perm)		1852	1583		1863		1130					1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	80	10	0	100	0	30	0	0	0	0	10
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	6
Lane Group Flow (vph)	0	90	2	0	100	0	30	0	0	0	0	4
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	pm+pt		Perm	pm+pt		Perm
Protected Phases	4	4	4 5	3	3	3 1	5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)		4.9	11.7		7.1		29.0					22.2
Effective Green, g (s)		4.9	11.7		7.1		29.0					22.2
Actuated g/C Ratio		0.09	0.20		0.12		0.50					0.39
Clearance Time (s)		5.5			5.5		5.5					5.5
Vehicle Extension (s)		3.0			3.0		3.0					3.0
Lane Grp Cap (vph)		157	322		230		584					611
v/s Ratio Prot		c0.05	0.00		c0.05		c0.00					
v/s Ratio Perm							c0.02					0.00
v/c Ratio		0.57	0.01		0.43		0.05					0.01
Uniform Delay, d1		25.3	18.3		23.3		7.5					10.9
Progression Factor		1.00	1.00		1.00		1.00					1.00
Incremental Delay, d2		5.0	0.0		1.3		0.0					0.0
Delay (s)		30.3	18.3		24.7		7.5					10.9
Level of Service		C	B		C		A					B
Approach Delay (s)		29.1			24.7			7.5			10.9	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	150	70	70	1075	50	2075
v/c Ratio	0.06	0.69	0.21	0.30	0.49	0.13	0.99
Control Delay	0.4	51.8	5.2	9.6	10.8	5.0	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	51.8	5.2	9.6	10.8	5.0	36.2
Queue Length 50th (ft)	0	79	0	10	179	7	~663
Queue Length 95th (ft)	0	143	21	29	244	18	#830
Internal Link Dist (ft)	1063	844			730		672
Turn Bay Length (ft)			200	200		350	
Base Capacity (vph)	359	270	386	232	2199	389	2106
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.56	0.18	0.30	0.49	0.13	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	10	150	0	70	70	975	100	50	1975	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.93			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695			1770	1583	1770	3490		1770	3514	
Flt Permitted		0.83			0.74	1.00	0.08	1.00		0.22	1.00	
Satd. Flow (perm)		1447			1386	1583	140	3490		414	3514	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	0	10	150	0	70	70	975	100	50	1975	100
RTOR Reduction (vph)	0	17	0	0	0	59	0	7	0	0	4	0
Lane Group Flow (vph)	0	3	0	0	150	11	70	1068	0	50	2071	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		13.2			13.2	13.2	58.5	53.1		55.7	51.7	
Effective Green, g (s)		13.2			13.2	13.2	58.5	53.1		55.7	51.7	
Actuated g/C Ratio		0.15			0.15	0.15	0.67	0.61		0.64	0.60	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		220			210	240	195	2135		328	2093	
v/s Ratio Prot							c0.02	0.31		0.01	c0.59	
v/s Ratio Perm		0.00			c0.11	0.01	0.22			0.09		
v/c Ratio		0.01			0.71	0.04	0.36	0.50		0.15	0.99	
Uniform Delay, d1		31.3			35.0	31.4	19.2	9.4		6.2	17.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			10.9	0.1	1.1	0.8		0.2	17.4	
Delay (s)		31.3			45.9	31.5	20.4	10.3		6.4	34.7	
Level of Service		C			D	C	C	B		A	C	
Approach Delay (s)		31.3			41.3			10.9			34.0	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	10	185	50	1500	275	2315
v/c Ratio	0.11	0.03	0.81	0.32	0.81	0.82	1.00
Control Delay	37.4	0.1	63.6	13.4	23.8	43.6	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Total Delay	37.4	0.1	63.6	13.4	23.8	43.6	42.9
Queue Length 50th (ft)	11	0	104	8	410	115	~846
Queue Length 95th (ft)	33	0	#211	18	517	#232	#987
Internal Link Dist (ft)		768	686		522		730
Turn Bay Length (ft)	200			200		200	
Base Capacity (vph)	210	390	254	154	1854	379	2312
Starvation Cap Reductn	0	0	0	0	0	0	40
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.03	0.73	0.32	0.81	0.73	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	10	125	10	50	50	1250	250	275	2275	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.96		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1736		1770	3451		1770	3530	
Flt Permitted	0.66	1.00			0.79		0.08	1.00		0.07	1.00	
Satd. Flow (perm)	1238	1583			1421		142	3451		129	3530	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	0	10	125	10	50	50	1250	250	275	2275	40
RTOR Reduction (vph)	0	9	0	0	14	0	0	16	0	0	1	0
Lane Group Flow (vph)	20	1	0	0	171	0	50	1484	0	275	2314	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.6	14.6			14.6		55.6	52.3		72.0	63.2	
Effective Green, g (s)	14.6	14.6			14.6		55.6	52.3		72.0	63.2	
Actuated g/C Ratio	0.15	0.15			0.15		0.57	0.54		0.74	0.65	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	236			212		135	1849		333	2285	
v/s Ratio Prot		0.00					0.01	0.43		c0.12	c0.66	
v/s Ratio Perm	0.02				c0.12		0.20			0.49		
v/c Ratio	0.11	0.01			0.81		0.37	0.80		0.83	1.01	
Uniform Delay, d1	35.9	35.3			40.1		21.6	18.4		28.4	17.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0			19.8		1.7	2.6		15.3	22.0	
Delay (s)	36.1	35.3			60.0		23.3	21.1		43.7	39.2	
Level of Service	D	D			E		C	C		D	D	
Approach Delay (s)		35.9			60.0			21.1			39.7	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	30	150	530	575	1725
v/c Ratio	0.14	0.46	0.45	0.72	0.63
Control Delay	31.0	11.4	19.3	10.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	11.4	19.3	10.9	5.9
Queue Length 50th (ft)	10	0	76	69	143
Queue Length 95th (ft)	39	52	170	198	257
Internal Link Dist (ft)	564		472		791
Turn Bay Length (ft)				200	
Base Capacity (vph)	531	579	1482	1200	3284
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.26	0.36	0.48	0.53

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	30	150	500	30	575	1725
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3509		1770	3539
Flt Permitted	0.95	1.00	1.00		0.33	1.00
Satd. Flow (perm)	1770	1583	3509		607	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	150	500	30	575	1725
RTOR Reduction (vph)	0	136	4	0	0	0
Lane Group Flow (vph)	30	14	526	0	575	1725
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	5.5	5.5	20.5		44.3	44.3
Effective Green, g (s)	5.5	5.5	20.5		44.3	44.3
Actuated g/C Ratio	0.09	0.09	0.34		0.73	0.73
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	160	143	1183		792	2578
v/s Ratio Prot	c0.02	0.01	0.15		0.22	c0.49
v/s Ratio Perm					c0.31	
v/c Ratio	0.19	0.09	0.44		0.73	0.67
Uniform Delay, d1	25.6	25.4	15.7		4.7	4.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.3	0.3		3.3	0.7
Delay (s)	26.2	25.7	16.0		8.0	5.0
Level of Service	C	C	B		A	A
Approach Delay (s)	25.7		16.0			5.8
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	50	825	50	100	1400
v/c Ratio	0.05	0.19	0.64	0.04	0.25	0.47
Control Delay	30.9	3.5	11.1	0.3	3.6	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	3.5	11.1	0.3	3.6	3.2
Queue Length 50th (ft)	3	0	215	0	8	91
Queue Length 95th (ft)	19	8	352	3	18	133
Internal Link Dist (ft)	1291		1285			1496
Turn Bay Length (ft)					100	
Base Capacity (vph)	523	536	1621	1390	407	3362
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.09	0.51	0.04	0.25	0.42

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	50	825	50	100	1400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.20	1.00
Satd. Flow (perm)	1770	1583	1863	1583	368	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	50	825	50	100	1400
RTOR Reduction (vph)	0	47	0	19	0	0
Lane Group Flow (vph)	10	3	825	31	100	1400
Turn Type	NA	Prot	NA	Perm	pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	3.3	3.3	38.7	38.7	47.6	47.6
Effective Green, g (s)	3.3	3.3	38.7	38.7	47.6	47.6
Actuated g/C Ratio	0.05	0.05	0.63	0.63	0.77	0.77
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	94	84	1164	989	359	2721
v/s Ratio Prot	c0.01	0.00	c0.44		0.02	c0.40
v/s Ratio Perm				0.02	0.20	
v/c Ratio	0.11	0.03	0.71	0.03	0.28	0.51
Uniform Delay, d1	27.9	27.8	7.8	4.4	5.4	2.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	2.0	0.0	0.4	0.2
Delay (s)	28.4	27.9	9.8	4.4	5.8	2.9
Level of Service	C	C	A	A	A	A
Approach Delay (s)	28.0		9.5			3.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	450	350	250	90	100	225	70	200	50	350	600	125
v/c Ratio	1.05	0.77	0.36	0.43	0.40	0.34	0.29	0.35	0.06	0.57	0.78	0.16
Control Delay	84.5	42.1	7.7	27.7	38.3	4.1	16.5	27.2	0.1	17.0	31.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.5	42.1	7.7	27.7	38.3	4.1	16.5	27.2	0.1	17.0	31.4	0.4
Queue Length 50th (ft)	~210	175	25	32	50	0	18	87	0	108	279	0
Queue Length 95th (ft)	#446	272	75	64	97	42	43	157	0	189	#497	0
Internal Link Dist (ft)		676			1895			1533			1285	
Turn Bay Length (ft)	180			400		70	180		90			150
Base Capacity (vph)	428	574	688	207	362	698	242	578	807	639	774	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.61	0.36	0.43	0.28	0.32	0.29	0.35	0.06	0.55	0.78	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	350	250	90	100	225	70	200	50	350	600	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.44	1.00	1.00	0.55	1.00	1.00	0.26	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	823	1863	1583	1027	1863	1583	484	1863	1583	903	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	350	250	90	100	225	70	200	50	350	600	125
RTOR Reduction (vph)	0	0	128	0	0	164	0	0	33	0	0	74
Lane Group Flow (vph)	450	350	122	90	100	61	70	200	17	350	600	51
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	28.8	20.2	24.5	12.8	9.7	22.8	30.1	25.8	28.9	44.4	34.6	34.6
Effective Green, g (s)	28.8	20.2	24.5	12.8	9.7	22.8	30.1	25.8	28.9	44.4	34.6	34.6
Actuated g/C Ratio	0.34	0.24	0.29	0.15	0.12	0.27	0.36	0.31	0.34	0.53	0.41	0.41
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	434	446	564	183	214	532	238	570	646	611	765	650
v/s Ratio Prot	c0.17	0.19	0.01	0.02	0.05	0.02	0.01	0.11	0.00	c0.09	c0.32	
v/s Ratio Perm	c0.19		0.07	0.06		0.02	0.09		0.01	0.21		0.03
v/c Ratio	1.04	0.78	0.22	0.49	0.47	0.11	0.29	0.35	0.03	0.57	0.78	0.08
Uniform Delay, d1	26.0	30.0	22.6	31.9	34.8	23.1	18.8	22.7	18.3	12.2	21.6	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	53.1	8.8	0.2	2.1	1.6	0.1	0.7	1.7	0.0	1.3	7.9	0.2
Delay (s)	79.0	38.8	22.8	34.0	36.4	23.2	19.5	24.4	18.3	13.5	29.5	15.3
Level of Service	E	D	C	C	D	C	B	C	B	B	C	B
Approach Delay (s)		52.2			28.7			22.4			22.6	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	80	10	110	100	440
v/c Ratio	0.48	0.26	0.01	0.08	0.11	0.32
Control Delay	25.7	12.8	3.9	3.5	4.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	12.8	3.9	3.5	4.1	4.6
Queue Length 50th (ft)	34	10	1	9	9	46
Queue Length 95th (ft)	71	38	5	27	28	106
Internal Link Dist (ft)	1109	935		718		1533
Turn Bay Length (ft)			100		410	
Base Capacity (vph)	501	588	685	1368	950	1361
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.14	0.01	0.08	0.11	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	50	20	0	30	50	10	100	10	100	375	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	0.99		1.00	0.98	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1784			1706		1770	1837		1770	1821	
Flt Permitted		0.83			1.00		0.49	1.00		0.69	1.00	
Satd. Flow (perm)		1508			1706		922	1837		1278	1821	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	50	20	0	30	50	10	100	10	100	375	65
RTOR Reduction (vph)	0	16	0	0	43	0	0	3	0	0	6	0
Lane Group Flow (vph)	0	104	0	0	37	0	10	107	0	100	434	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.2			8.2		42.8	42.8		42.8	42.8	
Effective Green, g (s)		8.2			8.2		42.8	42.8		42.8	42.8	
Actuated g/C Ratio		0.14			0.14		0.71	0.71		0.71	0.71	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		206			233		657	1310		911	1298	
v/s Ratio Prot					0.02			0.06			c0.24	
v/s Ratio Perm		c0.07					0.01			0.08		
v/c Ratio		0.51			0.16		0.02	0.08		0.11	0.33	
Uniform Delay, d1		24.0			22.9		2.5	2.6		2.7	3.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0			0.3		0.0	0.1		0.2	0.7	
Delay (s)		26.0			23.2		2.5	2.7		2.9	3.9	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		26.0			23.2			2.7			3.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	30	0	450	0	0	0	40	60	0	0	175	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	450	0	0	0	40	60	0	0	175	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	480	0	100	0	185
Volume Left (vph)	30	0	40	0	0
Volume Right (vph)	450	0	0	0	10
Hadj (s)	-0.52	0.00	0.23	0.00	0.00
Departure Headway (s)	4.2	5.3	6.1	5.8	5.3
Degree Utilization, x	0.56	0.00	0.17	0.00	0.27
Capacity (veh/h)	823	616	542	571	628
Control Delay (s)	12.3	8.3	9.1	7.6	10.2
Approach Delay (s)	12.3	0.0	9.1		10.2
Approach LOS	B	A	A		B

Intersection Summary			
Delay	11.4		
Level of Service	B		
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	100	40	50	20	80	450
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	100	40	50	20	80	450

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	140	70	530
Volume Left (vph)	100	0	80
Volume Right (vph)	40	20	0
Hadj (s)	0.01	-0.14	0.06
Departure Headway (s)	5.3	4.8	4.4
Degree Utilization, x	0.21	0.09	0.65
Capacity (veh/h)	618	711	791
Control Delay (s)	9.7	8.2	15.5
Approach Delay (s)	9.7	8.2	15.5
Approach LOS	A	A	C

Intersection Summary			
Delay	13.7		
Level of Service	B		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay (sec/veh)	14.8
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	2	2
Conflicting Circle Lanes	2	2	2	2
Adjusted Approach Flow (vph)	122	3	235	810
Demand Flow Rate (pc/h)	125	3	240	826
Vehicles Circulating (pc/h)	370	311	94	130
Vehicles Exiting (pc/h)	586	22	401	184
Follow-Up Headway (s)	3.186	3.186	3.186	3.186
Ped Vol. Crossing Leg (#/hr)	0	0	0	0
Ped Capacity Adjustment	1.000	1.000	1.000	1.000
Approach Delay (sec/veh)	5.7	4.0	4.5	19.3
Approach LOS	A	A	A	C

Lane	Left	Left	Left	Right	Left	Right
Designated moves	LTR	LTR	L	TR	L	TR
Assumed Moves	LTR	LTR	L	TR	L	TR
Right Turn Channelized						
Lane Utilization	1.000	1.000	0.533	0.467	0.012	0.988
Critical Headway (s)	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow Rate (pc/h)	125	3	128	112	10	816
Capacity, Entry Lane (pc/h)	872	909	1053	1058	1025	1032
Entry HV Adjustment Factor	0.976	1.000	0.977	0.982	1.000	0.980
Flow Rate, Entry (vph)	122	3	125	110	10	800
Capacity, Entry (vph)	851	909	1028	1039	1025	1011
Volume to Capacity Ratio	0.143	0.003	0.122	0.106	0.010	0.791
Control Delay (sec/veh)	5.7	4.0	4.6	4.4	3.6	19.5
Level of Service	A	A	A	A	A	C
95th-Percentile Queue (veh)	0	0	0	0	0	9

Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	10	70	125	165	455
v/c Ratio	0.04	0.26	0.18	0.06	0.24
Control Delay	19.2	10.7	3.9	2.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	10.7	3.9	2.5	8.5
Queue Length 50th (ft)	3	3	10	5	38
Queue Length 95th (ft)	13	30	27	14	74
Internal Link Dist (ft)		834		757	1195
Turn Bay Length (ft)	200		200		
Base Capacity (vph)	611	599	713	2692	1913
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.12	0.18	0.06	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	60	0	0	0	125	125	40	0	375	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5					5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	
Frt	1.00	0.87					1.00	0.96			0.97	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1770	1623					1770	3411			3446	
Flt Permitted	0.95	1.00					0.40	1.00			1.00	
Satd. Flow (perm)	1770	1623					751	3411			3446	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	10	60	0	0	0	125	125	40	0	375	80
RTOR Reduction (vph)	0	55	0	0	0	0	0	12	0	0	23	0
Lane Group Flow (vph)	10	15	0	0	0	0	125	153	0	0	432	0
Turn Type	Split	NA					pm+pt	NA			NA	
Protected Phases	4	4					5	2			6	
Permitted Phases							2					
Actuated Green, G (s)	4.0	4.0					36.6	36.6			25.6	
Effective Green, g (s)	4.0	4.0					36.6	36.6			25.6	
Actuated g/C Ratio	0.08	0.08					0.71	0.71			0.50	
Clearance Time (s)	5.5	5.5					5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	137	125					641	2419			1709	
v/s Ratio Prot	0.01	c0.01					c0.02	0.04			c0.13	
v/s Ratio Perm							0.12					
v/c Ratio	0.07	0.12					0.20	0.06			0.25	
Uniform Delay, d1	22.1	22.2					2.7	2.3			7.5	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4					0.1	0.1			0.4	
Delay (s)	22.3	22.6					2.8	2.3			7.8	
Level of Service	C	C					A	A			A	
Approach Delay (s)		22.5			0.0			2.5			7.8	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	10	10	20	250	10	340
v/c Ratio	0.23	0.01	0.01	0.02	0.09	0.01	0.12
Control Delay	39.0	0.0	0.0	3.5	4.2	3.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	0.0	0.0	3.5	4.2	3.6	4.9
Queue Length 50th (ft)	22	0	0	2	12	1	15
Queue Length 95th (ft)	50	0	0	10	55	7	71
Internal Link Dist (ft)		1256	713		1510		757
Turn Bay Length (ft)				150		250	
Base Capacity (vph)	182	921	842	882	2940	953	2792
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.01	0.01	0.02	0.09	0.01	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	0	10	0	0	10	20	250	0	10	300	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539		1770	3477	
Flt Permitted	0.60	1.00			1.00		0.54	1.00		0.60	1.00	
Satd. Flow (perm)	1112	1583			1611		999	3539		1112	3477	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	0	10	0	0	10	20	250	0	10	300	40
RTOR Reduction (vph)	0	9	0	0	10	0	0	0	0	0	6	0
Lane Group Flow (vph)	40	1	0	0	0	0	20	250	0	10	334	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	10.9	10.9			1.2		72.2	69.6		69.4	68.2	
Effective Green, g (s)	10.9	10.9			1.2		72.2	69.6		69.4	68.2	
Actuated g/C Ratio	0.11	0.11			0.01		0.74	0.71		0.71	0.69	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	175			19		754	2508		793	2414	
v/s Ratio Prot	c0.01	0.00			0.00		c0.00	0.07		0.00	c0.10	
v/s Ratio Perm	c0.02						0.02			0.01		
v/c Ratio	0.26	0.01			0.01		0.03	0.10		0.01	0.14	
Uniform Delay, d1	39.7	38.8			47.9		3.5	4.5		4.2	5.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.0			0.1		0.0	0.1		0.0	0.1	
Delay (s)	40.7	38.8			48.0		3.5	4.6		4.3	5.2	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		40.3			48.0			4.5			5.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	200	375	125	80	400	100
v/c Ratio	0.55	0.47	0.25	0.07	0.56	0.14
Control Delay	25.8	6.0	7.0	5.8	18.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	6.0	7.0	5.8	18.1	1.9
Queue Length 50th (ft)	60	25	15	10	101	0
Queue Length 95th (ft)	112	72	41	28	198	14
Internal Link Dist (ft)	1895			1548	1510	
Turn Bay Length (ft)	180		100			
Base Capacity (vph)	512	809	507	1111	714	696
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.46	0.25	0.07	0.56	0.14

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	200	375	125	80	400	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.34	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	624	1863	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	375	125	80	400	100
RTOR Reduction (vph)	0	168	0	0	0	62
Lane Group Flow (vph)	200	207	125	80	400	38
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	11.3	17.6	33.1	33.1	21.3	21.3
Effective Green, g (s)	11.3	17.6	33.1	33.1	21.3	21.3
Actuated g/C Ratio	0.20	0.32	0.60	0.60	0.38	0.38
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	361	660	503	1113	716	608
v/s Ratio Prot	c0.11	c0.04	0.03	0.04	c0.21	
v/s Ratio Perm		0.10	0.12			0.02
v/c Ratio	0.55	0.31	0.25	0.07	0.56	0.06
Uniform Delay, d1	19.8	14.3	5.8	4.7	13.4	10.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.3	0.3	0.1	3.1	0.2
Delay (s)	21.6	14.6	6.1	4.8	16.5	11.0
Level of Service	C	B	A	A	B	B
Approach Delay (s)	17.0			5.6	15.4	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	0	150	0	0	0	30	175	10	0	850	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	150	0	0	0	30	175	10	0	850	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1135	1145	900	1240	1190	180	950			185		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1135	1145	900	1240	1190	180	950			185		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	100	56	100	100	100	96			100		
cM capacity (veh/h)	174	191	337	82	180	863	723			1390		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	180	0	30	185	0	950
Volume Left	30	0	30	0	0	0
Volume Right	150	0	0	10	0	100
cSH	291	1700	723	1700	1700	1700
Volume to Capacity	0.62	0.00	0.04	0.11	0.00	0.56
Queue Length 95th (ft)	95	0	3	0	0	0
Control Delay (s)	35.4	0.0	10.2	0.0	0.0	0.0
Lane LOS	E	A	B			
Approach Delay (s)	35.4	0.0	1.4		0.0	
Approach LOS	E	A				

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	68.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	10	0	70	50	60	10	90	10	90	125	60
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	10	0	70	50	60	10	90	10	90	125	60

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	20	180	110	275
Volume Left (vph)	10	70	10	90
Volume Right (vph)	0	60	10	60
Hadj (s)	0.13	-0.09	0.00	-0.03
Departure Headway (s)	5.2	4.8	4.7	4.5
Degree Utilization, x	0.03	0.24	0.14	0.34
Capacity (veh/h)	621	702	716	761
Control Delay (s)	8.4	9.2	8.5	9.9
Approach Delay (s)	8.4	9.2	8.5	9.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.4		
Level of Service	A		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	10	20	60	50	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	10	20	60	50	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	165	65	80			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	165	65	80			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	99	99			
cM capacity (veh/h)	815	999	1518			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	70	80	80
Volume Left	60	20	0
Volume Right	10	0	30
cSH	837	1518	1700
Volume to Capacity	0.08	0.01	0.05
Queue Length 95th (ft)	7	1	0
Control Delay (s)	9.7	1.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	1.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	750	525	225	90
v/c Ratio	0.33	0.33	0.10	0.16
Control Delay	4.5	0.6	3.6	2.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.5	0.6	3.6	2.5
Queue Length 50th (ft)	36	0	9	0
Queue Length 95th (ft)	67	0	21	7
Internal Link Dist (ft)	412		676	814
Turn Bay Length (ft)		200		
Base Capacity (vph)	2285	1583	2285	1285
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.33	0.10	0.07

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	750	525	0	225	60	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	1.00		0.95	0.97	
Frt	1.00	0.85		1.00	0.95	
Flt Protected	1.00	1.00		1.00	0.97	
Satd. Flow (prot)	3539	1583		3539	3322	
Flt Permitted	1.00	1.00		1.00	0.97	
Satd. Flow (perm)	3539	1583		3539	3322	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	750	525	0	225	60	30
RTOR Reduction (vph)	0	118	0	0	78	0
Lane Group Flow (vph)	750	407	0	225	12	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	31.5	37.8		31.5	6.3	
Effective Green, g (s)	31.5	37.8		31.5	6.3	
Actuated g/C Ratio	0.65	0.77		0.65	0.13	
Clearance Time (s)	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2284	1583		2284	428	
v/s Ratio Prot	c0.21	c0.03		0.06	0.00	
v/s Ratio Perm		0.22				
v/c Ratio	0.33	0.26		0.10	0.03	
Uniform Delay, d1	3.9	1.5		3.3	18.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.1	0.0	
Delay (s)	4.3	1.6		3.4	18.6	
Level of Service	A	A		A	B	
Approach Delay (s)	3.2			3.4	18.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	40	10	20	20	20	10	60	10	80	450	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	40	10	20	20	20	10	60	10	80	450	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	730	710	460	730	710	60	470			70		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	730	710	460	730	710	60	470			70		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	88	98	93	94	98	99			95		
cM capacity (veh/h)	302	337	601	288	337	1005	1092			1531		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	50	60	70	10	550
Volume Left	0	20	10	0	80
Volume Right	10	20	0	10	20
cSH	369	404	1092	1700	1531
Volume to Capacity	0.14	0.15	0.01	0.01	0.05
Queue Length 95th (ft)	12	13	1	0	4
Control Delay (s)	16.3	15.5	1.3	0.0	1.6
Lane LOS	C	C	A		A
Approach Delay (s)	16.3	15.5	1.1		1.6
Approach LOS	C	C			

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	80	10	0	125	20	10	0	10	10	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	80	10	0	125	20	10	0	10	10	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	145			90			270	270	85	270	265	135
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	145			90			270	270	85	270	265	135
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	99	100	99
cM capacity (veh/h)	1437			1505			668	628	974	668	632	914

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	110	145	20	20
Volume Left	20	0	10	10
Volume Right	10	20	10	10
cSH	1437	1505	792	772
Volume to Capacity	0.01	0.00	0.03	0.03
Queue Length 95th (ft)	1	0	2	2
Control Delay (s)	1.5	0.0	9.7	9.8
Lane LOS	A		A	A
Approach Delay (s)	1.5	0.0	9.7	9.8
Approach LOS			A	A

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	20	0	100	225	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	20	0	100	225	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	355	255	285			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355	255	285			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	97	100			
cM capacity (veh/h)	643	784	1277			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	100	285
Volume Left	60	0	0
Volume Right	20	0	60
cSH	673	1277	1700
Volume to Capacity	0.12	0.00	0.17
Queue Length 95th (ft)	10	0	0
Control Delay (s)	11.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	11.1	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	80	40	0	40	0	10	10	0	0	20	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	80	40	0	40	0	10	10	0	0	20	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	40			120			200	180	40	165	160	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	40			120			200	180	40	165	160	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	99	100	100	97	97
cM capacity (veh/h)	1570			1468			716	709	1031	787	728	956

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	130	40	20	50
Volume Left	10	0	10	0
Volume Right	40	0	0	30
cSH	1570	1468	713	849
Volume to Capacity	0.01	0.00	0.03	0.06
Queue Length 95th (ft)	0	0	2	5
Control Delay (s)	0.6	0.0	10.2	9.5
Lane LOS	A		B	A
Approach Delay (s)	0.6	0.0	10.2	9.5
Approach LOS			B	A

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	28.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	515	70	1685
v/c Ratio	0.09	0.19	0.09	0.50
Control Delay	32.7	3.0	1.2	1.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.7	3.0	1.2	1.7
Queue Length 50th (ft)	5	20	0	0
Queue Length 95th (ft)	18	64	12	166
Internal Link Dist (ft)		991		472
Turn Bay Length (ft)			150	
Base Capacity (vph)	110	2782	761	3372
Starvation Cap Reductn	0	0	0	123
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.19	0.09	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	0	0	0	475	40	70	1675	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.5				5.5		5.5	5.5	
Lane Util. Factor				1.00				0.95		1.00	0.95	
Frt				1.00				0.99		1.00	1.00	
Flt Protected				0.95				1.00		0.95	1.00	
Satd. Flow (prot)				1770				3498		1770	3536	
Flt Permitted				0.95				1.00		0.42	1.00	
Satd. Flow (perm)				1770				3498		782	3536	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	10	0	0	0	475	40	70	1675	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	10	0	0	0	511	0	70	1685	0
Turn Type	Perm			pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				1.1				54.6		63.7	63.7	
Effective Green, g (s)				1.1				54.6		63.7	63.7	
Actuated g/C Ratio				0.01				0.72		0.84	0.84	
Clearance Time (s)				5.5				5.5		5.5	5.5	
Vehicle Extension (s)				3.0				3.0		3.0	3.0	
Lane Grp Cap (vph)				25				2519		704	2971	
v/s Ratio Prot				c0.01				0.15		0.00	c0.48	
v/s Ratio Perm										0.08		
v/c Ratio				0.40				0.20		0.10	0.57	
Uniform Delay, d1				37.0				3.5		1.2	1.8	
Progression Factor				1.00				1.00		1.00	1.00	
Incremental Delay, d2				10.2				0.2		0.1	0.8	
Delay (s)				47.2				3.7		1.3	2.6	
Level of Service				D				A		A	A	
Approach Delay (s)		0.0			47.2			3.7			2.6	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	40	30	50	500	1440
v/c Ratio	0.25	0.13	0.16	0.16	0.53
Control Delay	37.4	1.1	3.3	2.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	1.1	3.3	2.1	7.9
Queue Length 50th (ft)	19	0	4	26	209
Queue Length 95th (ft)	48	0	12	44	301
Internal Link Dist (ft)	603			1496	991
Turn Bay Length (ft)			150		
Base Capacity (vph)	370	408	323	3037	2715
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.07	0.15	0.16	0.53

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	30	50	500	1350	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3506	
Flt Permitted	0.95	1.00	0.13	1.00	1.00	
Satd. Flow (perm)	1770	1583	247	3539	3506	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	30	50	500	1350	90
RTOR Reduction (vph)	0	28	0	0	4	0
Lane Group Flow (vph)	40	2	50	500	1436	0
Turn Type	NA	custom	pm+pt	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	4.8	4.8	68.0	68.0	59.0	
Effective Green, g (s)	4.8	4.8	68.0	68.0	59.0	
Actuated g/C Ratio	0.06	0.06	0.81	0.81	0.70	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	101	90	264	2871	2468	
v/s Ratio Prot		0.00	0.01	c0.14	c0.41	
v/s Ratio Perm	c0.02		0.15			
v/c Ratio	0.40	0.02	0.19	0.17	0.58	
Uniform Delay, d1	38.1	37.3	3.8	1.7	6.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	0.1	0.4	0.1	1.0	
Delay (s)	40.6	37.4	4.2	1.9	7.2	
Level of Service	D	D	A	A	A	
Approach Delay (s)	39.2			2.1	7.2	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	975	850	70	175	100
v/c Ratio	0.48	0.54	0.19	0.07	0.14
Control Delay	13.0	1.3	4.3	3.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	1.3	4.3	3.1	7.7
Queue Length 50th (ft)	170	0	6	7	1
Queue Length 95th (ft)	229	0	11	12	21
Internal Link Dist (ft)	496			698	342
Turn Bay Length (ft)		250	200		
Base Capacity (vph)	2027	1583	398	2418	719
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.54	0.18	0.07	0.14

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	975	850	70	175	60	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3539	1583	1770	3539	3298	
Flt Permitted	1.00	1.00	0.21	1.00	0.97	
Satd. Flow (perm)	3539	1583	393	3539	3298	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	975	850	70	175	60	40
RTOR Reduction (vph)	0	0	0	0	78	0
Lane Group Flow (vph)	975	850	70	175	22	0
Turn Type	NA	Free	pm+pt	NA	NA	
Protected Phases	2		1	6	3	
Permitted Phases		Free	6			
Actuated Green, G (s)	50.5	90.0	61.5	61.5	17.5	
Effective Green, g (s)	50.5	90.0	61.5	61.5	17.5	
Actuated g/C Ratio	0.56	1.00	0.68	0.68	0.19	
Clearance Time (s)	5.5		5.5	5.5	5.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1985	1583	352	2418	641	
v/s Ratio Prot	0.28		0.01	0.05	0.01	
v/s Ratio Perm		c0.54	0.12			
v/c Ratio	0.49	0.54	0.20	0.07	0.03	
Uniform Delay, d1	12.0	0.0	6.3	4.7	29.4	
Progression Factor	1.00	1.00	0.66	0.63	1.00	
Incremental Delay, d2	0.9	1.3	0.3	0.1	0.1	
Delay (s)	12.8	1.3	4.4	3.1	29.5	
Level of Service	B	A	A	A	C	
Approach Delay (s)	7.5			3.5	29.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1150	350	550	275	40	30
v/c Ratio	0.98	0.46	1.01	0.11	0.07	0.08
Control Delay	49.0	6.5	75.3	4.5	31.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	6.5	75.3	4.5	31.2	0.5
Queue Length 50th (ft)	209	5	~319	22	9	0
Queue Length 95th (ft)	#460	73	#530	35	23	0
Internal Link Dist (ft)	698			585	318	
Turn Bay Length (ft)		350	350		150	150
Base Capacity (vph)	1175	759	542	2477	610	361
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.46	1.01	0.11	0.07	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1150	350	550	275	40	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1150	350	550	275	40	30
RTOR Reduction (vph)	0	234	0	0	0	25
Lane Group Flow (vph)	1150	116	550	275	40	5
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	29.9	29.9	27.6	63.0	16.0	16.0
Effective Green, g (s)	29.9	29.9	27.6	63.0	16.0	16.0
Actuated g/C Ratio	0.33	0.33	0.31	0.70	0.18	0.18
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1175	525	542	2477	610	281
v/s Ratio Prot	c0.32		c0.31	0.08	c0.01	
v/s Ratio Perm		0.07				0.00
v/c Ratio	0.98	0.22	1.01	0.11	0.07	0.02
Uniform Delay, d1	29.7	21.7	31.2	4.4	30.8	30.5
Progression Factor	0.89	1.68	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.2	0.9	42.4	0.1	0.2	0.1
Delay (s)	47.6	37.4	73.6	4.5	31.0	30.6
Level of Service	D	D	E	A	C	C
Approach Delay (s)	45.2			50.6	30.8	
Approach LOS	D			D	C	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	950	100	325	175	10	70	575	525
v/c Ratio	0.33	1.05	0.89	0.31	0.29	0.03	0.08	0.91	0.60
Control Delay	47.7	77.6	104.8	26.8	6.0	11.6	6.5	43.3	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	77.6	104.8	26.8	6.0	11.6	6.5	43.3	15.4
Queue Length 50th (ft)	22	~301	58	81	0	3	8	275	133
Queue Length 95th (ft)	54	#426	#153	120	49	11	29	#575	288
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	123	901	112	1058	596	296	871	634	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	1.05	0.89	0.31	0.29	0.03	0.08	0.91	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	700	250	100	325	175	10	30	40	575	150	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.91		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3400		1770	3539	1583	1770	1703		1770	1663	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.26	1.00		0.71	1.00	
Satd. Flow (perm)	1770	3400		1770	3539	1583	478	1703		1325	1663	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	700	250	100	325	175	10	30	40	575	150	375
RTOR Reduction (vph)	0	40	0	0	0	126	0	20	0	0	91	0
Lane Group Flow (vph)	40	910	0	100	325	49	10	50	0	575	434	0
Turn Type	Prot	NA		Prot	NA	Prot	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6	6	3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.8	25.0		5.7	26.9	26.9	49.4	49.4		43.1	43.1	
Effective Green, g (s)	3.8	25.0		5.7	26.9	26.9	49.4	49.4		43.1	43.1	
Actuated g/C Ratio	0.04	0.26		0.06	0.28	0.28	0.51	0.51		0.45	0.45	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	69	879		104	985	440	255	870		591	741	
v/s Ratio Prot	0.02	c0.27		c0.06	0.09	0.03	0.00	c0.03			0.26	
v/s Ratio Perm							0.02			c0.43		
v/c Ratio	0.58	1.04		0.96	0.33	0.11	0.04	0.06		0.97	0.59	
Uniform Delay, d1	45.6	35.8		45.3	27.7	25.9	14.1	11.9		26.2	20.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.3	39.8		75.5	0.9	0.5	0.1	0.1		30.9	3.4	
Delay (s)	56.9	75.6		120.9	28.6	26.5	14.2	12.0		57.1	23.4	
Level of Service	E	E		F	C	C	B	B		E	C	
Approach Delay (s)		74.9			43.3			12.3			41.0	
Approach LOS		E			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	96.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	10	1575	20	20	820
v/c Ratio	0.01	1.02	0.06	0.02	0.39
Control Delay	29.6	34.5	24.0	23.4	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	34.5	24.0	23.4	9.0
Queue Length 50th (ft)	2	0	8	4	101
Queue Length 95th (ft)	10	#1163	25	13	137
Internal Link Dist (ft)	917			636	2135
Turn Bay Length (ft)		300	200		
Base Capacity (vph)	853	1541	345	1002	2078
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	1.02	0.06	0.02	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	10	1575	20	20	800	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	3539	1583	1770	3539	3433	
Flt Permitted	1.00	1.00	0.60	1.00	0.95	
Satd. Flow (perm)	3539	1583	1116	3539	3433	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	1575	20	20	800	20
RTOR Reduction (vph)	0	186	0	0	41	0
Lane Group Flow (vph)	10	1389	20	20	779	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	21.7	75.2	28.8	28.8	53.5	
Effective Green, g (s)	21.7	75.2	28.8	28.8	53.5	
Actuated g/C Ratio	0.23	0.81	0.31	0.31	0.57	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	823	1369	355	1092	1968	
v/s Ratio Prot	0.00	c0.58	c0.00	0.01	0.23	
v/s Ratio Perm		0.30	0.02			
v/c Ratio	0.01	1.01	0.06	0.02	0.40	
Uniform Delay, d1	27.6	9.0	22.7	22.4	11.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	28.1	0.1	0.0	0.1	
Delay (s)	27.6	37.1	22.8	22.5	11.1	
Level of Service	C	D	C	C	B	
Approach Delay (s)	37.1			22.6	11.1	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	93.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBL	SBR
Lane Group Flow (vph)	100	10	100	40	10
v/c Ratio	0.35	0.02	0.35	0.07	0.01
Control Delay	26.9	0.1	26.9	11.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	0.1	26.9	11.7	0.0
Queue Length 50th (ft)	33	0	34	8	0
Queue Length 95th (ft)	76	0	76	26	0
Internal Link Dist (ft)	468		451		
Turn Bay Length (ft)				180	180
Base Capacity (vph)	564	609	567	607	1164
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.02	0.18	0.07	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	90	10	0	100	0	40	0	0	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5		5.5					5.5
Lane Util. Factor		1.00	1.00		1.00		1.00					1.00
Frt		1.00	0.85		1.00		1.00					0.85
Flt Protected		1.00	1.00		1.00		0.95					1.00
Satd. Flow (prot)		1853	1583		1863		1770					1583
Flt Permitted		1.00	1.00		1.00		0.61					1.00
Satd. Flow (perm)		1853	1583		1863		1130					1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	90	10	0	100	0	40	0	0	0	0	10
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	0	6
Lane Group Flow (vph)	0	100	2	0	100	0	40	0	0	0	0	4
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	pm+pt		Perm	pm+pt		Perm
Protected Phases	4	4	4 5	3	3	3 1	5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)		6.9	14.5		6.9		29.8					22.2
Effective Green, g (s)		6.9	14.5		6.9		29.8					22.2
Actuated g/C Ratio		0.11	0.24		0.11		0.50					0.37
Clearance Time (s)		5.5			5.5		5.5					5.5
Vehicle Extension (s)		3.0			3.0		3.0					3.0
Lane Grp Cap (vph)		212	381		213		582					584
v/s Ratio Prot		c0.05	0.00		c0.05		c0.00					
v/s Ratio Perm							c0.03					0.00
v/c Ratio		0.47	0.01		0.47		0.07					0.01
Uniform Delay, d1		24.9	17.3		24.9		8.1					12.0
Progression Factor		1.00	1.00		1.00		1.00					1.00
Incremental Delay, d2		1.7	0.0		1.6		0.1					0.0
Delay (s)		26.6	17.3		26.5		8.1					12.0
Level of Service		C	B		C		A					B
Approach Delay (s)		25.7			26.5			8.1			12.0	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	150	80	80	1225	50	2000
v/c Ratio	0.06	0.69	0.24	0.35	0.56	0.15	0.95
Control Delay	0.4	51.8	7.2	11.6	11.7	5.3	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	51.8	7.2	11.6	11.7	5.3	29.8
Queue Length 50th (ft)	0	79	0	11	217	7	~547
Queue Length 95th (ft)	0	143	29	38	295	18	#782
Internal Link Dist (ft)	1063	844			730		672
Turn Bay Length (ft)			200	200		350	
Base Capacity (vph)	359	270	386	232	2197	339	2105
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.56	0.21	0.34	0.56	0.15	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	10	150	0	80	80	1100	125	50	1900	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.93			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695			1770	1583	1770	3485		1770	3513	
Flt Permitted		0.83			0.74	1.00	0.08	1.00		0.18	1.00	
Satd. Flow (perm)		1447			1386	1583	140	3485		328	3513	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	0	10	150	0	80	80	1100	125	50	1900	100
RTOR Reduction (vph)	0	17	0	0	0	68	0	9	0	0	4	0
Lane Group Flow (vph)	0	3	0	0	150	12	80	1216	0	50	1996	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		13.2			13.2	13.2	58.5	53.1		55.7	51.7	
Effective Green, g (s)		13.2			13.2	13.2	58.5	53.1		55.7	51.7	
Actuated g/C Ratio		0.15			0.15	0.15	0.67	0.61		0.64	0.60	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		220			210	240	195	2131		276	2092	
v/s Ratio Prot							c0.03	0.35		0.01	c0.57	
v/s Ratio Perm		0.00			c0.11	0.01	0.25			0.11		
v/c Ratio		0.01			0.71	0.05	0.41	0.57		0.18	0.95	
Uniform Delay, d1		31.3			35.0	31.4	17.7	10.1		6.7	16.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			10.9	0.1	1.4	1.1		0.3	11.5	
Delay (s)		31.3			45.9	31.5	19.2	11.2		7.0	28.0	
Level of Service		C			D	C	B	B		A	C	
Approach Delay (s)		31.3			40.9			11.7			27.4	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	20	220	60	1775	300	2230
v/c Ratio	0.10	0.07	0.92	0.40	0.96	0.92	0.97
Control Delay	37.2	24.9	80.1	17.2	36.6	61.5	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total Delay	37.2	24.9	80.1	17.2	36.6	61.5	34.5
Queue Length 50th (ft)	11	5	130	9	540	138	~695
Queue Length 95th (ft)	33	27	#270	26	#737	#297	#925
Internal Link Dist (ft)		768	686		522		730
Turn Bay Length (ft)	200			200		200	
Base Capacity (vph)	202	291	244	149	1845	333	2294
Starvation Cap Reductn	0	0	0	0	0	0	45
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.90	0.40	0.96	0.90	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	10	150	10	60	60	1475	300	300	2200	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93			0.96		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1723			1735		1770	3449		1770	3532	
Flt Permitted	0.66	1.00			0.78		0.07	1.00		0.07	1.00	
Satd. Flow (perm)	1235	1723			1406		138	3449		126	3532	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	10	10	150	10	60	60	1475	300	300	2200	30
RTOR Reduction (vph)	0	8	0	0	13	0	0	17	0	0	1	0
Lane Group Flow (vph)	20	12	0	0	207	0	60	1758	0	300	2229	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0			16.0		57.2	53.8		73.4	64.5	
Effective Green, g (s)	16.0	16.0			16.0		57.2	53.8		73.4	64.5	
Actuated g/C Ratio	0.16	0.16			0.16		0.57	0.54		0.73	0.64	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	196	274			224		133	1848		322	2269	
v/s Ratio Prot		0.01					0.02	0.51		c0.13	c0.63	
v/s Ratio Perm	0.02				c0.15		0.24			0.55		
v/c Ratio	0.10	0.04			0.92		0.45	0.95		0.93	0.98	
Uniform Delay, d1	36.1	35.7			41.6		22.4	22.1		33.1	17.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1			39.2		2.4	11.5		32.8	14.9	
Delay (s)	36.3	35.8			80.8		24.8	33.6		65.9	32.3	
Level of Service	D	D			F		C	C		E	C	
Approach Delay (s)		36.0			80.8			33.3			36.3	
Approach LOS		D			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	30	150	555	575	1700
v/c Ratio	0.12	0.43	0.57	0.75	0.64
Control Delay	24.8	9.5	20.2	14.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	9.5	20.2	14.6	6.6
Queue Length 50th (ft)	10	0	85	78	136
Queue Length 95th (ft)	30	44	145	#260	253
Internal Link Dist (ft)	564		472		791
Turn Bay Length (ft)				200	
Base Capacity (vph)	600	635	1270	913	2809
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.24	0.44	0.63	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	30	150	525	30	575	1700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3511		1770	3539
Flt Permitted	0.95	1.00	1.00		0.29	1.00
Satd. Flow (perm)	1770	1583	3511		531	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	150	525	30	575	1700
RTOR Reduction (vph)	0	135	6	0	0	0
Lane Group Flow (vph)	30	15	549	0	575	1700
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	5.3	5.3	15.1		36.9	36.9
Effective Green, g (s)	5.3	5.3	15.1		36.9	36.9
Actuated g/C Ratio	0.10	0.10	0.28		0.69	0.69
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	176	157	996		747	2454
v/s Ratio Prot	c0.02	0.01	0.16		0.24	c0.48
v/s Ratio Perm					c0.30	
v/c Ratio	0.17	0.10	0.55		0.77	0.69
Uniform Delay, d1	21.9	21.8	16.2		6.1	4.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.3	0.7		4.8	0.9
Delay (s)	22.4	22.0	16.8		10.9	5.7
Level of Service	C	C	B		B	A
Approach Delay (s)	22.1		16.8			7.0
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	50	850	50	100	1375
v/c Ratio	0.05	0.18	0.65	0.04	0.27	0.46
Control Delay	27.6	1.5	11.9	0.1	4.0	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	1.5	11.9	0.1	4.0	3.3
Queue Length 50th (ft)	4	0	221	0	8	88
Queue Length 95th (ft)	16	2	385	1	19	133
Internal Link Dist (ft)	1291		1285			1496
Turn Bay Length (ft)					100	
Base Capacity (vph)	530	555	1307	1145	377	2918
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.09	0.65	0.04	0.27	0.47

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	50	850	50	100	1375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.18	1.00
Satd. Flow (perm)	1770	1583	1863	1583	343	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	50	850	50	100	1375
RTOR Reduction (vph)	0	47	0	19	0	0
Lane Group Flow (vph)	10	3	850	31	100	1375
Turn Type	NA	Prot	NA	Perm	pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	3.3	3.3	37.8	37.8	46.2	46.2
Effective Green, g (s)	3.3	3.3	37.8	37.8	46.2	46.2
Actuated g/C Ratio	0.05	0.05	0.62	0.62	0.76	0.76
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	96	86	1163	989	330	2702
v/s Ratio Prot	c0.01	0.00	c0.46		0.01	c0.39
v/s Ratio Perm				0.02	0.22	
v/c Ratio	0.10	0.03	0.73	0.03	0.30	0.51
Uniform Delay, d1	27.2	27.1	7.8	4.3	5.8	2.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	2.4	0.0	0.5	0.2
Delay (s)	27.7	27.2	10.2	4.4	6.3	2.9
Level of Service	C	C	B	A	A	A
Approach Delay (s)	27.3		9.9			3.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	450	375	275	90	100	225	70	200	50	350	600	125
v/c Ratio	1.03	0.81	0.40	0.45	0.38	0.33	0.30	0.35	0.06	0.57	0.78	0.16
Control Delay	79.1	44.3	9.1	28.2	37.4	4.0	17.0	28.0	0.2	17.4	32.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.1	44.3	9.1	28.2	37.4	4.0	17.0	28.0	0.2	17.4	32.2	0.4
Queue Length 50th (ft)	206	191	35	32	50	0	19	90	0	112	289	0
Queue Length 95th (ft)	#443	292	93	64	97	42	43	158	0	189	#497	0
Internal Link Dist (ft)		676			1895			1533			1285	
Turn Bay Length (ft)	180			400		70	180		90			150
Base Capacity (vph)	435	570	694	201	359	712	237	567	798	636	767	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.66	0.40	0.45	0.28	0.32	0.30	0.35	0.06	0.55	0.78	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	375	275	90	100	225	70	200	50	350	600	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.45	1.00	1.00	0.50	1.00	1.00	0.26	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	844	1863	1583	922	1863	1583	478	1863	1583	896	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	375	275	90	100	225	70	200	50	350	600	125
RTOR Reduction (vph)	0	0	125	0	0	162	0	0	33	0	0	74
Lane Group Flow (vph)	450	375	150	90	100	63	70	200	17	350	600	51
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	29.5	20.9	25.2	13.5	10.4	23.8	29.8	25.5	28.6	44.4	34.6	34.6
Effective Green, g (s)	29.5	20.9	25.2	13.5	10.4	23.8	29.8	25.5	28.6	44.4	34.6	34.6
Actuated g/C Ratio	0.35	0.25	0.30	0.16	0.12	0.28	0.35	0.30	0.34	0.52	0.41	0.41
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	441	458	572	177	228	546	233	559	635	606	759	645
v/s Ratio Prot	c0.16	0.20	0.01	0.02	0.05	0.02	0.02	0.11	0.00	c0.09	c0.32	
v/s Ratio Perm	c0.19		0.08	0.06		0.02	0.09		0.01	0.21		0.03
v/c Ratio	1.02	0.82	0.26	0.51	0.44	0.12	0.30	0.36	0.03	0.58	0.79	0.08
Uniform Delay, d1	26.0	30.2	22.8	31.8	34.5	22.7	19.3	23.3	18.8	12.5	22.0	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	10.9	0.2	2.3	1.3	0.1	0.7	1.8	0.0	1.3	8.2	0.2
Delay (s)	74.1	41.1	23.0	34.1	35.9	22.8	20.1	25.1	18.9	13.8	30.2	15.6
Level of Service	E	D	C	C	D	C	C	C	B	B	C	B
Approach Delay (s)		50.1			28.4			23.0			23.2	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	80	10	110	100	435
v/c Ratio	0.48	0.26	0.01	0.08	0.11	0.32
Control Delay	25.7	12.8	3.9	3.5	4.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	12.8	3.9	3.5	4.1	4.6
Queue Length 50th (ft)	34	10	1	9	9	46
Queue Length 95th (ft)	71	38	5	27	28	105
Internal Link Dist (ft)	1109	935		718		1533
Turn Bay Length (ft)			100		410	
Base Capacity (vph)	501	588	690	1368	950	1361
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.14	0.01	0.08	0.11	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	50	20	0	30	50	10	100	10	100	375	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	0.99		1.00	0.98	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1784			1706		1770	1837		1770	1824	
Flt Permitted		0.83			1.00		0.50	1.00		0.69	1.00	
Satd. Flow (perm)		1508			1706		928	1837		1278	1824	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	50	20	0	30	50	10	100	10	100	375	60
RTOR Reduction (vph)	0	16	0	0	43	0	0	3	0	0	6	0
Lane Group Flow (vph)	0	104	0	0	37	0	10	107	0	100	429	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.2			8.2		42.8	42.8		42.8	42.8	
Effective Green, g (s)		8.2			8.2		42.8	42.8		42.8	42.8	
Actuated g/C Ratio		0.14			0.14		0.71	0.71		0.71	0.71	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		206			233		661	1310		911	1301	
v/s Ratio Prot					0.02			0.06			c0.24	
v/s Ratio Perm		c0.07					0.01			0.08		
v/c Ratio		0.51			0.16		0.02	0.08		0.11	0.33	
Uniform Delay, d1		24.0			22.9		2.5	2.6		2.7	3.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0			0.3		0.0	0.1		0.2	0.7	
Delay (s)		26.0			23.2		2.5	2.7		2.9	3.9	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		26.0			23.2			2.7			3.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	30	0	450	0	0	0	40	60	0	0	200	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	450	0	0	0	40	60	0	0	200	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	480	0	100	0	210
Volume Left (vph)	30	0	40	0	0
Volume Right (vph)	450	0	0	0	10
Hadj (s)	-0.52	0.00	0.23	0.00	0.01
Departure Headway (s)	4.3	5.4	6.2	5.9	5.3
Degree Utilization, x	0.57	0.00	0.17	0.00	0.31
Capacity (veh/h)	809	602	536	566	628
Control Delay (s)	12.8	8.4	9.2	7.7	10.7
Approach Delay (s)	12.8	0.0	9.2		10.7
Approach LOS	B	A	A		B

Intersection Summary				
Delay	11.7			
Level of Service	B			
Intersection Capacity Utilization	56.0%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	100	40	30	20	80	475
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	100	40	30	20	80	475

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	140	50	555
Volume Left (vph)	100	0	80
Volume Right (vph)	40	20	0
Hadj (s)	0.01	-0.21	0.06
Departure Headway (s)	5.3	4.7	4.4
Degree Utilization, x	0.21	0.07	0.68
Capacity (veh/h)	616	715	797
Control Delay (s)	9.7	8.0	16.4
Approach Delay (s)	9.7	8.0	16.4
Approach LOS	A	A	C

Intersection Summary			
Delay	14.5		
Level of Service	B		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay (sec/veh)	15.2
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	2	2
Conflicting Circle Lanes	2	2	2	2
Adjusted Approach Flow (vph)	120	0	285	810
Demand Flow Rate (pc/h)	123	0	291	826
Vehicles Circulating (pc/h)	367	362	92	153
Vehicles Exiting (pc/h)	612	20	398	209
Follow-Up Headway (s)	3.186	3.186	3.186	3.186
Ped Vol. Crossing Leg (#/hr)	0	0	0	0
Ped Capacity Adjustment	1.000	1.000	1.000	1.000
Approach Delay (sec/veh)	5.6	0.0	4.7	20.4
Approach LOS	A	-	A	C

Lane	Left	Left	Left	Right	Left	Right
Designated moves	LTR	LTR	L	TR	L	TR
Assumed Moves	LTR	LTR	L	TR	L	TR
Right Turn Channelized						
Lane Utilization	1.000	1.000	0.526	0.474	0.012	0.988
Critical Headway (s)	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow Rate (pc/h)	123	0	153	138	10	816
Capacity, Entry Lane (pc/h)	874	877	1055	1059	1007	1015
Entry HV Adjustment Factor	0.976	1.000	0.980	0.982	1.000	0.980
Flow Rate, Entry (vph)	120	0	150	135	10	800
Capacity, Entry (vph)	853	877	1034	1040	1007	995
Volume to Capacity Ratio	0.141	0.000	0.145	0.130	0.010	0.804
Control Delay (sec/veh)	5.6	4.1	4.8	4.6	3.7	20.6
Level of Service	A	A	A	A	A	C
95th-Percentile Queue (veh)	0	0	1	0	0	9

Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	10	70	125	165	480
v/c Ratio	0.04	0.24	0.19	0.06	0.23
Control Delay	17.0	9.6	4.3	2.7	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	9.6	4.3	2.7	8.3
Queue Length 50th (ft)	2	2	10	5	41
Queue Length 95th (ft)	12	27	28	14	76
Internal Link Dist (ft)		834		757	1195
Turn Bay Length (ft)	200		200		
Base Capacity (vph)	656	639	668	2624	2129
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.11	0.19	0.06	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	60	0	0	0	125	125	40	0	400	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5					5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	
Frt	1.00	0.87					1.00	0.96			0.97	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1770	1623					1770	3411			3451	
Flt Permitted	0.95	1.00					0.39	1.00			1.00	
Satd. Flow (perm)	1770	1623					726	3411			3451	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	10	60	0	0	0	125	125	40	0	400	80
RTOR Reduction (vph)	0	55	0	0	0	0	0	12	0	0	21	0
Lane Group Flow (vph)	10	15	0	0	0	0	125	153	0	0	459	0
Turn Type	Split	NA					pm+pt	NA			NA	
Protected Phases	4	4					5	2			6	
Permitted Phases							2					
Actuated Green, G (s)	3.9	3.9					33.5	33.5			24.4	
Effective Green, g (s)	3.9	3.9					33.5	33.5			24.4	
Actuated g/C Ratio	0.08	0.08					0.69	0.69			0.50	
Clearance Time (s)	5.5	5.5					5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	142	130					580	2360			1739	
v/s Ratio Prot	0.01	c0.01					c0.02	0.04			c0.13	
v/s Ratio Perm							0.13					
v/c Ratio	0.07	0.11					0.22	0.06			0.26	
Uniform Delay, d1	20.6	20.6					2.8	2.4			6.9	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4					0.2	0.1			0.4	
Delay (s)	20.8	21.0					3.0	2.5			7.2	
Level of Service	C	C					A	A			A	
Approach Delay (s)		21.0			0.0			2.7			7.2	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	10	10	20	250	10	375
v/c Ratio	0.28	0.01	0.01	0.02	0.08	0.01	0.13
Control Delay	40.5	0.0	0.0	3.4	4.1	3.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	0.0	0.0	3.4	4.1	3.6	4.8
Queue Length 50th (ft)	28	0	0	2	12	1	17
Queue Length 95th (ft)	59	0	0	10	55	7	77
Internal Link Dist (ft)		1256	713		1510		757
Turn Bay Length (ft)				150		250	
Base Capacity (vph)	181	900	835	853	2942	947	2790
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.01	0.01	0.02	0.08	0.01	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	0	10	0	0	10	20	250	0	10	325	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539		1770	3468	
Flt Permitted	0.60	1.00			1.00		0.52	1.00		0.60	1.00	
Satd. Flow (perm)	1112	1583			1611		966	3539		1112	3468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	0	10	0	0	10	20	250	0	10	325	50
RTOR Reduction (vph)	0	9	0	0	10	0	0	0	0	0	7	0
Lane Group Flow (vph)	50	1	0	0	0	0	20	250	0	10	368	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	10.9	10.9			1.2		72.7	70.1		69.9	68.7	
Effective Green, g (s)	10.9	10.9			1.2		72.7	70.1		69.9	68.7	
Actuated g/C Ratio	0.11	0.11			0.01		0.74	0.71		0.71	0.70	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	150	174			19		732	2513		795	2413	
v/s Ratio Prot	c0.01	0.00			0.00		c0.00	0.07		0.00	c0.11	
v/s Ratio Perm	c0.02						0.02			0.01		
v/c Ratio	0.33	0.01			0.01		0.03	0.10		0.01	0.15	
Uniform Delay, d1	40.2	39.1			48.2		3.5	4.5		4.2	5.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.0			0.1		0.0	0.1		0.0	0.1	
Delay (s)	41.5	39.1			48.3		3.5	4.5		4.2	5.2	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		41.1			48.3			4.5			5.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	200	425	125	80	450	100
v/c Ratio	0.50	0.58	0.26	0.07	0.70	0.15
Control Delay	21.6	9.6	7.5	6.2	24.1	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	9.6	7.5	6.2	24.1	1.8
Queue Length 50th (ft)	52	50	15	9	114	0
Queue Length 95th (ft)	100	109	41	28	#272	12
Internal Link Dist (ft)	1895			1548	1510	
Turn Bay Length (ft)	180		100			
Base Capacity (vph)	614	738	474	1193	647	654
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.58	0.26	0.07	0.70	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	200	425	125	80	450	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.26	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	483	1863	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	425	125	80	450	100
RTOR Reduction (vph)	0	97	0	0	0	66
Lane Group Flow (vph)	200	328	125	80	450	34
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	8.9	15.6	28.8	28.8	16.6	16.6
Effective Green, g (s)	8.9	15.6	28.8	28.8	16.6	16.6
Actuated g/C Ratio	0.18	0.32	0.59	0.59	0.34	0.34
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	323	685	462	1101	635	539
v/s Ratio Prot	0.11	c0.07	0.04	0.04	c0.24	
v/s Ratio Perm		0.14	0.12			0.02
v/c Ratio	0.62	0.48	0.27	0.07	0.71	0.06
Uniform Delay, d1	18.3	13.3	5.7	4.2	13.9	10.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.5	0.3	0.1	6.6	0.2
Delay (s)	21.9	13.8	6.0	4.4	20.5	11.0
Level of Service	C	B	A	A	C	B
Approach Delay (s)	16.4			5.4	18.8	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	0	150	0	0	0	30	175	10	0	950	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	150	0	0	0	30	175	10	0	950	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1235	1245	1000	1340	1290	180	1050			185		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1235	1245	1000	1340	1290	180	1050			185		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	100	49	100	100	100	95			100		
cM capacity (veh/h)	148	166	295	62	156	863	663			1390		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	180	0	30	185	0	1050
Volume Left	30	0	30	0	0	0
Volume Right	150	0	0	10	0	100
cSH	253	1700	663	1700	1700	1700
Volume to Capacity	0.71	0.00	0.05	0.11	0.00	0.62
Queue Length 95th (ft)	121	0	4	0	0	0
Control Delay (s)	47.9	0.0	10.7	0.0	0.0	0.0
Lane LOS	E	A	B			
Approach Delay (s)	47.9	0.0	1.5		0.0	
Approach LOS	E	A				

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	10	0	80	50	60	10	90	10	100	125	70
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	10	0	80	50	60	10	90	10	100	125	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	30	190	110	295
Volume Left (vph)	20	80	10	100
Volume Right (vph)	0	60	10	70
Hadj (s)	0.17	-0.07	0.00	-0.04
Departure Headway (s)	5.3	4.8	4.8	4.6
Degree Utilization, x	0.04	0.26	0.15	0.37
Capacity (veh/h)	606	688	699	750
Control Delay (s)	8.6	9.5	8.7	10.3
Approach Delay (s)	8.6	9.5	8.7	10.3
Approach LOS	A	A	A	B

Intersection Summary			
Delay	9.7		
Level of Service	A		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	10	20	60	50	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	10	20	60	50	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	165	65	80			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	165	65	80			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	99	99			
cM capacity (veh/h)	815	999	1518			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	70	80	80
Volume Left	60	20	0
Volume Right	10	0	30
cSH	837	1518	1700
Volume to Capacity	0.08	0.01	0.05
Queue Length 95th (ft)	7	1	0
Control Delay (s)	9.7	1.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	1.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	800	550	225	90
v/c Ratio	0.35	0.35	0.10	0.16
Control Delay	4.5	0.6	3.5	2.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.5	0.6	3.5	2.5
Queue Length 50th (ft)	40	0	9	0
Queue Length 95th (ft)	73	0	21	7
Internal Link Dist (ft)	412		676	814
Turn Bay Length (ft)		200		
Base Capacity (vph)	2309	1583	2309	1198
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.35	0.10	0.08

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	800	550	0	225	60	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	1.00		0.95	0.97	
Frt	1.00	0.85		1.00	0.95	
Flt Protected	1.00	1.00		1.00	0.97	
Satd. Flow (prot)	3539	1583		3539	3322	
Flt Permitted	1.00	1.00		1.00	0.97	
Satd. Flow (perm)	3539	1583		3539	3322	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	800	550	0	225	60	30
RTOR Reduction (vph)	0	121	0	0	79	0
Lane Group Flow (vph)	800	429	0	225	11	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	32.5	38.8		32.5	6.3	
Effective Green, g (s)	32.5	38.8		32.5	6.3	
Actuated g/C Ratio	0.65	0.78		0.65	0.13	
Clearance Time (s)	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2309	1583		2309	420	
v/s Ratio Prot	c0.23	c0.03		0.06	0.00	
v/s Ratio Perm		0.24				
v/c Ratio	0.35	0.27		0.10	0.03	
Uniform Delay, d1	3.9	1.5		3.2	19.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.1	0.0	
Delay (s)	4.3	1.6		3.3	19.1	
Level of Service	A	A		A	B	
Approach Delay (s)	3.2			3.3	19.1	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	40	10	20	20	20	10	60	10	80	475	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	40	10	20	20	20	10	60	10	80	475	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	755	735	485	755	735	60	495			70		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755	735	485	755	735	60	495			70		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	88	98	93	94	98	99			95		
cM capacity (veh/h)	290	326	582	276	326	1005	1069			1531		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	50	60	70	10	575
Volume Left	0	20	10	0	80
Volume Right	10	20	0	10	20
cSH	357	390	1069	1700	1531
Volume to Capacity	0.14	0.15	0.01	0.01	0.05
Queue Length 95th (ft)	12	13	1	0	4
Control Delay (s)	16.7	15.9	1.3	0.0	1.5
Lane LOS	C	C	A		A
Approach Delay (s)	16.7	15.9	1.1		1.5
Approach LOS	C	C			

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	54.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	20	90	0	125	20	20	0	10	10	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	20	90	0	125	20	20	0	10	10	0	10
Pedestrians											10	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	155			110			260	270	65	270	305	145
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	155			110			260	270	65	270	305	145
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	99	98	100	99
cM capacity (veh/h)	1413			1480			672	620	999	657	593	895

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	135	145	30	20
Volume Left	25	0	20	10
Volume Right	90	20	10	10
cSH	1413	1480	754	758
Volume to Capacity	0.02	0.00	0.04	0.03
Queue Length 95th (ft)	1	0	3	2
Control Delay (s)	1.5	0.0	10.0	9.9
Lane LOS	A		A	A
Approach Delay (s)	1.5	0.0	10.0	9.9
Approach LOS			A	A

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	29.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	20	0	100	250	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	20	0	100	250	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	385	285	320			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	385	285	320			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	97	100			
cM capacity (veh/h)	618	754	1240			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	100	320
Volume Left	60	0	0
Volume Right	20	0	70
cSH	647	1240	1700
Volume to Capacity	0.12	0.00	0.19
Queue Length 95th (ft)	11	0	0
Control Delay (s)	11.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	11.3	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	90	50	0	50	0	10	10	0	0	20	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	90	50	0	50	0	10	10	0	0	20	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	50			140			225	210	50	190	185	115
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			140			225	210	50	190	185	115
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	99	100	100	97	97
cM capacity (veh/h)	1557			1443			688	683	1018	758	705	937

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	150	50	20	50
Volume Left	10	0	10	0
Volume Right	50	0	0	30
cSH	1557	1443	686	828
Volume to Capacity	0.01	0.00	0.03	0.06
Queue Length 95th (ft)	0	0	2	5
Control Delay (s)	0.5	0.0	10.4	9.6
Lane LOS	A		B	A
Approach Delay (s)	0.5	0.0	10.4	9.6
Approach LOS			B	A

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	29.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	540	70	1660
v/c Ratio	0.09	0.19	0.09	0.49
Control Delay	32.7	3.1	1.2	1.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.7	3.1	1.2	1.6
Queue Length 50th (ft)	5	22	0	0
Queue Length 95th (ft)	18	67	12	162
Internal Link Dist (ft)		991		472
Turn Bay Length (ft)			150	
Base Capacity (vph)	110	2784	744	3372
Starvation Cap Reductn	0	0	0	125
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.19	0.09	0.51

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	0	0	0	500	40	70	1650	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.5				5.5		5.5	5.5	
Lane Util. Factor				1.00				0.95		1.00	0.95	
Frt				1.00				0.99		1.00	1.00	
Flt Protected				0.95				1.00		0.95	1.00	
Satd. Flow (prot)				1770				3500		1770	3536	
Flt Permitted				0.95				1.00		0.41	1.00	
Satd. Flow (perm)				1770				3500		763	3536	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	10	0	0	0	500	40	70	1650	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	10	0	0	0	536	0	70	1660	0
Turn Type	Perm			pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				1.1				54.6		63.7	63.7	
Effective Green, g (s)				1.1				54.6		63.7	63.7	
Actuated g/C Ratio				0.01				0.72		0.84	0.84	
Clearance Time (s)				5.5				5.5		5.5	5.5	
Vehicle Extension (s)				3.0				3.0		3.0	3.0	
Lane Grp Cap (vph)				25				2521		689	2971	
v/s Ratio Prot				c0.01				0.15		0.00	c0.47	
v/s Ratio Perm										0.08		
v/c Ratio				0.40				0.21		0.10	0.56	
Uniform Delay, d1				37.0				3.5		1.2	1.8	
Progression Factor				1.00				1.00		1.00	1.00	
Incremental Delay, d2				10.2				0.2		0.1	0.8	
Delay (s)				47.2				3.7		1.3	2.6	
Level of Service				D				A		A	A	
Approach Delay (s)		0.0			47.2			3.7			2.5	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	40	30	50	525	1415
v/c Ratio	0.25	0.13	0.15	0.17	0.52
Control Delay	37.4	1.1	3.3	2.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	1.1	3.3	2.1	7.8
Queue Length 50th (ft)	19	0	4	27	203
Queue Length 95th (ft)	48	0	12	46	292
Internal Link Dist (ft)	603			1496	991
Turn Bay Length (ft)			150		
Base Capacity (vph)	370	408	330	3037	2713
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.07	0.15	0.17	0.52

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	30	50	525	1325	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3505	
Flt Permitted	0.95	1.00	0.14	1.00	1.00	
Satd. Flow (perm)	1770	1583	257	3539	3505	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	30	50	525	1325	90
RTOR Reduction (vph)	0	28	0	0	4	0
Lane Group Flow (vph)	40	2	50	525	1411	0
Turn Type	NA	custom	pm+pt	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	4.8	4.8	68.0	68.0	59.0	
Effective Green, g (s)	4.8	4.8	68.0	68.0	59.0	
Actuated g/C Ratio	0.06	0.06	0.81	0.81	0.70	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	101	90	271	2871	2467	
v/s Ratio Prot		0.00	0.01	c0.15	c0.40	
v/s Ratio Perm	c0.02		0.14			
v/c Ratio	0.40	0.02	0.18	0.18	0.57	
Uniform Delay, d1	38.1	37.3	3.7	1.7	6.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	0.1	0.3	0.1	1.0	
Delay (s)	40.6	37.4	4.0	1.9	7.1	
Level of Service	D	D	A	A	A	
Approach Delay (s)	39.2			2.1	7.1	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	225	70	90	1025	625
v/c Ratio	0.12	0.04	0.12	0.44	0.76
Control Delay	12.4	0.1	5.2	6.5	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	0.1	5.2	6.5	33.4
Queue Length 50th (ft)	32	0	9	127	146
Queue Length 95th (ft)	63	0	36	164	187
Internal Link Dist (ft)	496			698	342
Turn Bay Length (ft)		250	200		
Base Capacity (vph)	1913	1583	743	2327	1220
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.04	0.12	0.44	0.51

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	225	70	90	1025	575	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3539	1583	1770	3539	3413	
Flt Permitted	1.00	1.00	0.55	1.00	0.96	
Satd. Flow (perm)	3539	1583	1021	3539	3413	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	70	90	1025	575	50
RTOR Reduction (vph)	0	0	0	0	76	0
Lane Group Flow (vph)	225	70	90	1025	549	0
Turn Type	NA	Free	pm+pt	NA	NA	
Protected Phases	2		1	6	3	
Permitted Phases		Free	6			
Actuated Green, G (s)	47.6	90.0	59.2	59.2	19.8	
Effective Green, g (s)	47.6	90.0	59.2	59.2	19.8	
Actuated g/C Ratio	0.53	1.00	0.66	0.66	0.22	
Clearance Time (s)	5.5		5.5	5.5	5.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1871	1583	722	2327	750	
v/s Ratio Prot	0.06		0.01	c0.29	c0.16	
v/s Ratio Perm		0.04	0.07			
v/c Ratio	0.12	0.04	0.12	0.44	0.73	
Uniform Delay, d1	10.7	0.0	5.7	7.4	32.6	
Progression Factor	1.00	1.00	0.74	0.73	1.00	
Incremental Delay, d2	0.1	0.1	0.1	0.6	3.7	
Delay (s)	10.8	0.1	4.3	6.0	36.3	
Level of Service	B	A	A	A	D	
Approach Delay (s)	8.2			5.8	36.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	300	30	20	900	375	300
v/c Ratio	0.17	0.04	0.04	0.47	0.32	0.41
Control Delay	10.4	0.1	9.9	13.9	23.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	0.1	9.9	13.9	23.1	4.5
Queue Length 50th (ft)	32	0	5	156	80	0
Queue Length 95th (ft)	51	m0	15	204	116	54
Internal Link Dist (ft)	698			585	318	
Turn Bay Length (ft)		350	350		150	150
Base Capacity (vph)	1720	818	563	1907	1163	734
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.04	0.04	0.47	0.32	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	300	30	20	900	375	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.50	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	933	3539	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	300	30	20	900	375	300
RTOR Reduction (vph)	0	17	0	0	0	198
Lane Group Flow (vph)	300	13	20	900	375	102
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Actuated Green, G (s)	40.4	40.4	48.5	48.5	30.5	30.5
Effective Green, g (s)	40.4	40.4	48.5	48.5	30.5	30.5
Actuated g/C Ratio	0.45	0.45	0.54	0.54	0.34	0.34
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1588	710	526	1907	1163	536
v/s Ratio Prot	0.08		0.00	c0.25	c0.11	
v/s Ratio Perm		0.01	0.02			0.06
v/c Ratio	0.19	0.02	0.04	0.47	0.32	0.19
Uniform Delay, d1	14.9	13.8	9.8	12.8	22.1	21.0
Progression Factor	0.71	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	0.0	0.8	0.7	0.8
Delay (s)	10.9	13.8	9.9	13.7	22.8	21.8
Level of Service	B	B	A	B	C	C
Approach Delay (s)	11.2			13.6	22.4	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	385	10	700	525	150	110	200	40
v/c Ratio	0.80	0.22	0.11	0.68	0.58	0.72	0.16	0.83	0.12
Control Delay	62.5	17.2	44.2	33.7	4.6	58.1	10.3	63.1	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	17.2	44.2	33.7	4.6	58.1	10.3	63.1	14.8
Queue Length 50th (ft)	132	54	6	195	0	104	31	108	5
Queue Length 95th (ft)	#236	118	22	262	61	m131	m53	#214	31
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	304	1726	90	1022	939	218	711	265	367
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.22	0.11	0.68	0.56	0.69	0.15	0.75	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	375	10	10	700	525	150	60	50	200	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.93		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3525		1770	3539	1583	1770	1736		1770	1653	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.69	1.00	
Satd. Flow (perm)	1770	3525		1770	3539	1583	1770	1736		1278	1653	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	375	10	10	700	525	150	60	50	200	10	30
RTOR Reduction (vph)	0	2	0	0	0	332	0	32	0	0	24	0
Lane Group Flow (vph)	225	383	0	10	700	193	150	78	0	200	16	0
Turn Type	Prot	NA		Prot	NA	custom	custom	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						8	3			4		
Actuated Green, G (s)	14.4	39.6		0.8	26.0	33.1	10.6	33.1		17.0	17.0	
Effective Green, g (s)	14.4	39.6		0.8	26.0	33.1	10.6	33.1		17.0	17.0	
Actuated g/C Ratio	0.16	0.44		0.01	0.29	0.37	0.12	0.37		0.19	0.19	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	283	1551		15	1022	582	208	638		241	312	
v/s Ratio Prot	c0.13	0.11		0.01	c0.20		c0.08	0.05			0.01	
v/s Ratio Perm						0.12				c0.16		
v/c Ratio	0.80	0.25		0.67	0.68	0.33	0.72	0.12		0.83	0.05	
Uniform Delay, d1	36.4	15.8		44.5	28.4	20.5	38.3	18.8		35.1	29.9	
Progression Factor	1.16	1.17		1.00	1.00	1.00	1.02	1.02		1.00	1.00	
Incremental Delay, d2	13.9	0.4		75.9	3.7	0.3	11.2	0.1		20.5	0.1	
Delay (s)	56.2	18.9		120.3	32.1	20.8	50.3	19.2		55.6	30.0	
Level of Service	E	B		F	C	C	D	B		E	C	
Approach Delay (s)		32.7			28.0			37.1			51.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	10	925	10	30	1935
v/c Ratio	0.01	0.59	0.03	0.03	0.95
Control Delay	26.6	1.8	22.9	22.8	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	1.8	22.9	22.8	28.1
Queue Length 50th (ft)	2	0	4	6	468
Queue Length 95th (ft)	9	14	16	16	#685
Internal Link Dist (ft)	917			636	2135
Turn Bay Length (ft)		300	200		
Base Capacity (vph)	966	1561	365	1042	2047
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.59	0.03	0.03	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	10	925	10	30	1925	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	3539	1583	1770	3539	3440	
Flt Permitted	1.00	1.00	0.61	1.00	0.95	
Satd. Flow (perm)	3539	1583	1143	3539	3440	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	925	10	30	1925	10
RTOR Reduction (vph)	0	170	0	0	43	0
Lane Group Flow (vph)	10	755	10	30	1892	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	24.6	77.1	30.9	30.9	52.5	
Effective Green, g (s)	24.6	77.1	30.9	30.9	52.5	
Actuated g/C Ratio	0.26	0.82	0.33	0.33	0.56	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	922	1385	379	1158	1913	
v/s Ratio Prot	0.00	c0.30	0.00	c0.01	c0.55	
v/s Ratio Perm		0.17	0.01			
v/c Ratio	0.01	0.55	0.03	0.03	0.99	
Uniform Delay, d1	25.9	2.9	21.6	21.5	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.4	0.0	0.0	17.8	
Delay (s)	25.9	3.3	21.7	21.6	38.5	
Level of Service	C	A	C	C	D	
Approach Delay (s)	3.5			21.6	38.5	
Approach LOS	A			C	D	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBL	SBL	SBR
Lane Group Flow (vph)	480	125	80	20	20	10	10
v/c Ratio	0.83	0.16	0.34	0.06	0.04	0.02	0.01
Control Delay	38.9	3.6	33.5	0.3	16.6	16.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	3.6	33.5	0.3	16.6	16.5	0.0
Queue Length 50th (ft)	201	0	34	0	6	3	0
Queue Length 95th (ft)	#388	29	72	0	20	13	0
Internal Link Dist (ft)	468		451				
Turn Bay Length (ft)				180	180	180	180
Base Capacity (vph)	626	796	463	348	456	439	1080
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.16	0.17	0.06	0.04	0.02	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	450	125	0	80	20	20	0	0	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5	5.5	5.5			5.5		5.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00			1.00		1.00
Frt		1.00	0.85		1.00	0.85	1.00			1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00	0.95			0.95		1.00
Satd. Flow (prot)		1857	1583		1863	1583	1770			1770		1583
Flt Permitted		1.00	1.00		1.00	1.00	0.70			0.76		1.00
Satd. Flow (perm)		1857	1583		1863	1583	1301			1410		1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	450	125	0	80	20	20	0	0	10	0	10
RTOR Reduction (vph)	0	0	83	0	0	18	0	0	0	0	0	7
Lane Group Flow (vph)	0	480	42	0	80	2	20	0	0	10	0	3
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt		Perm	pm+pt		Perm
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2		2	6		6
Actuated Green, G (s)		20.9	23.9		6.8	8.2	23.6			20.4		19.0
Effective Green, g (s)		20.9	23.9		6.8	8.2	23.6			20.4		19.0
Actuated g/C Ratio		0.29	0.33		0.09	0.11	0.33			0.28		0.26
Clearance Time (s)		5.5	5.5		5.5	5.5	5.5			5.5		5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0			3.0		3.0
Lane Grp Cap (vph)		541	649		176	181	447			408		419
v/s Ratio Prot		c0.26	c0.00		c0.04	0.00	0.00			0.00		
v/s Ratio Perm			0.02			0.00	c0.01			0.01		0.00
v/c Ratio		0.89	0.06		0.45	0.01	0.04			0.02		0.01
Uniform Delay, d1		24.3	16.3		30.7	28.2	16.3			18.5		19.4
Progression Factor		1.00	1.00		1.00	1.00	1.00			1.00		1.00
Incremental Delay, d2		16.1	0.0		1.9	0.0	0.0			0.0		0.0
Delay (s)		40.3	16.3		32.6	28.2	16.4			18.5		19.4
Level of Service		D	B		C	C	B			B		B
Approach Delay (s)		35.4			31.7			16.4			19.0	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	30	200	80	2400	80	1160
v/c Ratio	0.14	0.95	0.26	1.01	0.56	0.43
Control Delay	2.6	108.6	12.6	43.2	33.8	6.2
Queue Delay	0.0	0.0	0.0	35.3	0.0	0.0
Total Delay	2.6	108.6	12.6	78.5	33.8	6.2
Queue Length 50th (ft)	0	183	0	~1116	19	167
Queue Length 95th (ft)	5	#341	49	#1333	77	199
Internal Link Dist (ft)	1063	844		730		672
Turn Bay Length (ft)			150		350	
Base Capacity (vph)	219	211	311	2379	146	2716
Starvation Cap Reductn	0	0	0	252	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.95	0.26	1.13	0.55	0.43

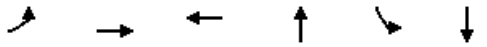
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	10	200	0	80	0	2250	150	80	1150	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	5.5		5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00	1.00		0.95		1.00	0.95	
Frt		0.95			1.00	0.85		0.99		1.00	1.00	
Flt Protected		0.97			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1722			1770	1583		3506		1770	3535	
Flt Permitted		0.61			0.74	1.00		1.00		0.04	1.00	
Satd. Flow (perm)		1084			1374	1583		3506		74	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	0	10	200	0	80	0	2250	150	80	1150	10
RTOR Reduction (vph)	0	25	0	0	0	68	0	4	0	0	0	0
Lane Group Flow (vph)	0	5	0	0	200	12	0	2396	0	80	1160	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		21.4			21.4	21.4		94.7		107.3	107.3	
Effective Green, g (s)		21.4			21.4	21.4		94.7		107.3	107.3	
Actuated g/C Ratio		0.15			0.15	0.15		0.68		0.77	0.77	
Clearance Time (s)		5.5			5.5	5.5		5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		166			210	242		2376		143	2715	
v/s Ratio Prot								c0.68		0.03	c0.33	
v/s Ratio Perm		0.00			c0.15	0.01				0.40		
v/c Ratio		0.03			0.95	0.05		1.01		0.56	0.43	
Uniform Delay, d1		50.3			58.6	50.5		22.5		40.3	5.6	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			48.4	0.1		20.6		4.7	0.5	
Delay (s)		50.4			107.0	50.6		43.1		44.9	6.1	
Level of Service		D			F	D		D		D	A	
Approach Delay (s)		50.4			90.9			43.1			8.6	
Approach LOS		D			F			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	139.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	20	20	190	2365	30	1535
v/c Ratio	0.16	0.07	0.79	0.93	0.22	0.56
Control Delay	44.5	0.5	49.0	22.7	7.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	0.5	49.0	22.7	7.1	6.0
Queue Length 50th (ft)	12	0	74	760	4	191
Queue Length 95th (ft)	36	0	#167	#1064	11	259
Internal Link Dist (ft)		768	686	522		730
Turn Bay Length (ft)	150				150	
Base Capacity (vph)	157	331	287	2549	135	2746
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.06	0.66	0.93	0.22	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	20	100	0	90	0	2275	90	30	1525	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5			5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frt	1.00	0.85			0.94			0.99		1.00	1.00	
Flt Protected	0.95	1.00			0.97			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1699			3519		1770	3536	
Flt Permitted	0.55	1.00			0.82			1.00		0.05	1.00	
Satd. Flow (perm)	1025	1583			1437			3519		90	3536	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	0	20	100	0	90	0	2275	90	30	1525	10
RTOR Reduction (vph)	0	18	0	0	70	0	0	2	0	0	0	0
Lane Group Flow (vph)	20	2	0	0	120	0	0	2363	0	30	1535	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.7	12.7			12.7			76.9		84.8	84.8	
Effective Green, g (s)	12.7	12.7			12.7			76.9		84.8	84.8	
Actuated g/C Ratio	0.12	0.12			0.12			0.71		0.78	0.78	
Clearance Time (s)	5.5	5.5			5.5			5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	119	185			168			2494		107	2763	
v/s Ratio Prot		0.00						c0.67		0.01	c0.43	
v/s Ratio Perm	0.02				c0.08					0.21		
v/c Ratio	0.17	0.01			0.72			0.95		0.28	0.56	
Uniform Delay, d1	43.1	42.4			46.2			14.0		26.9	4.6	
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.0			13.5			8.6		1.4	0.2	
Delay (s)	43.8	42.4			59.7			22.6		28.3	4.8	
Level of Service	D	D			E			C		C	A	
Approach Delay (s)		43.1			59.7			22.6			5.3	
Approach LOS		D			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	90	525	1570	250	775
v/c Ratio	0.22	0.96	0.96	0.87	0.34
Control Delay	29.0	50.2	38.4	50.0	7.9
Queue Delay	0.0	0.0	10.9	0.0	0.0
Total Delay	29.0	50.2	49.3	50.0	7.9
Queue Length 50th (ft)	41	177	440	89	96
Queue Length 95th (ft)	81	#383	#614	#224	128
Internal Link Dist (ft)	564		468		791
Turn Bay Length (ft)				150	
Base Capacity (vph)	431	560	1640	291	2279
Starvation Cap Reductn	0	0	94	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.94	1.02	0.86	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	90	525	1550	20	250	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3532		1770	3539
Flt Permitted	0.95	1.00	1.00		0.09	1.00
Satd. Flow (perm)	1770	1583	3532		159	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	90	525	1550	20	250	775
RTOR Reduction (vph)	0	176	1	0	0	0
Lane Group Flow (vph)	90	349	1569	0	250	775
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	20.9	20.9	41.3		57.1	57.1
Effective Green, g (s)	20.9	20.9	41.3		57.1	57.1
Actuated g/C Ratio	0.23	0.23	0.46		0.64	0.64
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	415	371	1639		288	2270
v/s Ratio Prot	0.05	c0.22	c0.44		c0.10	0.22
v/s Ratio Perm					0.46	
v/c Ratio	0.22	0.94	0.96		0.87	0.34
Uniform Delay, d1	27.5	33.4	23.0		25.3	7.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	31.8	13.4		23.0	0.1
Delay (s)	27.7	65.2	36.4		48.3	7.4
Level of Service	C	E	D		D	A
Approach Delay (s)	59.7		36.4			17.4
Approach LOS	E		D			B

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	20	100	980	125	975
v/c Ratio	0.08	0.29	0.51	0.30	0.38
Control Delay	20.1	4.5	11.3	5.3	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	4.5	11.3	5.3	4.3
Queue Length 50th (ft)	5	0	108	10	54
Queue Length 95th (ft)	20	19	168	25	88
Internal Link Dist (ft)	1291		1285		1507
Turn Bay Length (ft)				100	
Base Capacity (vph)	647	671	1948	418	2581
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.15	0.50	0.30	0.38

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	100	950	30	125	975
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3523		1770	3539
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1770	1583	3523		352	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	100	950	30	125	975
RTOR Reduction (vph)	0	90	3	0	0	0
Lane Group Flow (vph)	20	10	977	0	125	975
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	4.7	4.7	23.3		32.9	32.9
Effective Green, g (s)	4.7	4.7	23.3		32.9	32.9
Actuated g/C Ratio	0.10	0.10	0.48		0.68	0.68
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	171	153	1689		357	2395
v/s Ratio Prot	c0.01	0.01	c0.28		0.03	c0.28
v/s Ratio Perm					0.21	
v/c Ratio	0.12	0.06	0.58		0.35	0.41
Uniform Delay, d1	20.1	19.9	9.1		4.1	3.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.2	0.5		0.6	0.1
Delay (s)	20.4	20.1	9.6		4.7	3.6
Level of Service	C	C	A		A	A
Approach Delay (s)	20.2		9.6			3.7
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	125	50	80	175	300	175	375	60	175	225	325
v/c Ratio	0.69	0.35	0.09	0.27	0.55	0.43	0.36	0.66	0.07	0.49	0.40	0.46
Control Delay	40.4	28.0	0.3	26.2	31.2	6.8	13.9	27.8	0.2	17.0	21.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	28.0	0.3	26.2	31.2	6.8	13.9	27.8	0.2	17.0	21.5	5.0
Queue Length 50th (ft)	78	46	0	28	64	20	38	129	0	38	70	0
Queue Length 95th (ft)	#162	92	0	62	118	69	82	#246	0	82	138	54
Internal Link Dist (ft)		676			1895			1533			1285	
Turn Bay Length (ft)	180			400		70	180		90			150
Base Capacity (vph)	289	531	556	292	456	692	482	564	806	354	564	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.24	0.09	0.27	0.38	0.43	0.36	0.66	0.07	0.49	0.40	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	125	50	80	175	300	175	375	60	175	225	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.67	1.00	1.00	0.68	1.00	1.00	0.58	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1242	1863	1583	1261	1863	1583	1083	1863	1583	659	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	125	50	80	175	300	175	375	60	175	225	325
RTOR Reduction (vph)	0	0	36	0	0	163	0	0	36	0	0	228
Lane Group Flow (vph)	200	125	14	80	175	137	175	375	24	175	225	97
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	12.5	12.5	18.2	12.5	12.5	18.2	25.5	19.8	26.3	25.5	19.8	19.8
Effective Green, g (s)	12.5	12.5	18.2	12.5	12.5	18.2	25.5	19.8	26.3	25.5	19.8	19.8
Actuated g/C Ratio	0.19	0.19	0.27	0.19	0.19	0.27	0.38	0.30	0.40	0.38	0.30	0.30
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	285	350	433	286	350	564	474	554	626	347	554	471
v/s Ratio Prot	c0.07	0.07	0.00	0.03	c0.09	0.02	0.03	c0.20	0.00	c0.04	0.12	
v/s Ratio Perm	c0.06		0.01	0.03		0.07	0.11		0.01	0.15		0.06
v/c Ratio	0.70	0.36	0.03	0.28	0.50	0.24	0.37	0.68	0.04	0.50	0.41	0.21
Uniform Delay, d1	24.9	23.5	17.7	23.4	24.2	18.8	14.0	20.5	12.3	14.4	18.7	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	0.6	0.0	0.5	1.1	0.2	0.5	6.5	0.0	1.2	2.2	1.0
Delay (s)	32.4	24.1	17.7	23.9	25.3	19.0	14.5	27.1	12.4	15.6	20.9	18.5
Level of Service	C	C	B	C	C	B	B	C	B	B	C	B
Approach Delay (s)		27.7			21.7			22.0			18.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	150	20	285	40	140
v/c Ratio	0.37	0.41	0.02	0.22	0.05	0.11
Control Delay	19.3	10.9	4.0	4.4	4.1	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	10.9	4.0	4.4	4.1	3.2
Queue Length 50th (ft)	21	11	2	25	3	8
Queue Length 95th (ft)	53	48	8	61	13	26
Internal Link Dist (ft)	1109	935		718		1533
Turn Bay Length (ft)			100		410	
Base Capacity (vph)	736	835	870	1297	762	1259
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.18	0.02	0.22	0.05	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	50	10	10	40	100	20	275	10	40	100	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.91		1.00	0.99		1.00	0.96	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1802			1689		1770	1853		1770	1783	
Flt Permitted		0.84			0.97		0.67	1.00		0.59	1.00	
Satd. Flow (perm)		1539			1645		1244	1853		1090	1783	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	50	10	10	40	100	20	275	10	40	100	40
RTOR Reduction (vph)	0	9	0	0	85	0	0	1	0	0	13	0
Lane Group Flow (vph)	0	91	0	0	65	0	20	284	0	40	127	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.0			7.0		32.2	32.2		32.2	32.2	
Effective Green, g (s)		7.0			7.0		32.2	32.2		32.2	32.2	
Actuated g/C Ratio		0.15			0.15		0.67	0.67		0.67	0.67	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		223			238		831	1237		728	1191	
v/s Ratio Prot								c0.15			0.07	
v/s Ratio Perm		c0.06			0.04		0.02			0.04		
v/c Ratio		0.41			0.27		0.02	0.23		0.05	0.11	
Uniform Delay, d1		18.7			18.3		2.7	3.1		2.8	2.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			0.6		0.1	0.4		0.1	0.2	
Delay (s)		20.0			18.9		2.8	3.6		2.9	3.0	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		20.0			18.9			3.5			3.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	20	0	30	10	275	150	10	10	50	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	10	20	0	30	10	275	150	10	10	50	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	30	40	425	10	70
Volume Left (vph)	0	0	275	0	10
Volume Right (vph)	20	10	0	10	10
Hadj (s)	-0.37	-0.12	0.36	-0.67	-0.02
Departure Headway (s)	4.9	5.1	5.1	4.1	4.7
Degree Utilization, x	0.04	0.06	0.60	0.01	0.09
Capacity (veh/h)	660	634	698	864	739
Control Delay (s)	8.1	8.4	14.3	5.9	8.1
Approach Delay (s)	8.1	8.4	14.1		8.1
Approach LOS	A	A	B		A

Intersection Summary			
Delay	12.7		
Level of Service	B		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	10	50	375	100	30	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	50	375	100	30	20

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	60	475	50
Volume Left (vph)	10	0	30
Volume Right (vph)	50	100	0
Hadj (s)	-0.43	-0.09	0.15
Departure Headway (s)	4.6	4.0	4.7
Degree Utilization, x	0.08	0.53	0.06
Capacity (veh/h)	703	884	738
Control Delay (s)	8.0	11.4	8.0
Approach Delay (s)	8.0	11.4	8.0
Approach LOS	A	B	A

Intersection Summary			
Delay	10.8		
Level of Service	B		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay (sec/veh)	8.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	2	2
Conflicting Circle Lanes	2	2	2	2
Adjusted Approach Flow (vph)	435	20	505	170
Demand Flow Rate (pc/h)	444	20	516	173
Vehicles Circulating (pc/h)	112	790	326	61
Vehicles Exiting (pc/h)	122	51	229	749
Follow-Up Headway (s)	3.186	3.186	3.186	3.186
Ped Vol. Crossing Leg (#/hr)	0	0	0	0
Ped Capacity Adjustment	1.000	1.000	1.000	1.000
Approach Delay (sec/veh)	8.2	5.9	10.3	4.7
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Right	Left	Right
Designated moves	LTR	LTR	L	TR	L	TR
Assumed Moves	LTR	LTR	L	TR	L	TR
Right Turn Channelized						
Lane Utilization	1.000	1.000	0.099	0.901	0.058	0.942
Critical Headway (s)	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow Rate (pc/h)	444	20	51	465	10	163
Capacity, Entry Lane (pc/h)	1045	650	885	899	1079	1083
Entry HV Adjustment Factor	0.979	1.000	0.980	0.980	1.000	0.983
Flow Rate, Entry (vph)	435	20	50	455	10	160
Capacity, Entry (vph)	1023	650	868	881	1079	1064
Volume to Capacity Ratio	0.425	0.031	0.058	0.517	0.009	0.151
Control Delay (sec/veh)	8.2	5.9	4.7	11.0	3.4	4.7
Level of Service	A	A	A	B	A	A
95th-Percentile Queue (veh)	2	0	0	3	0	1

Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	60	110	60	550	160
v/c Ratio	0.25	0.38	0.08	0.22	0.08
Control Delay	23.1	14.0	4.0	3.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	14.0	4.0	3.0	8.4
Queue Length 50th (ft)	18	12	5	21	13
Queue Length 95th (ft)	43	46	17	43	32
Internal Link Dist (ft)		834		757	1195
Turn Bay Length (ft)	150		200		
Base Capacity (vph)	531	554	798	2496	2079
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.20	0.08	0.22	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	40	70	0	0	0	60	400	150	0	150	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5					5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	
Frt	1.00	0.90					1.00	0.96			0.99	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1770	1685					1770	3394			3506	
Flt Permitted	0.95	1.00					0.54	1.00			1.00	
Satd. Flow (perm)	1770	1685					1014	3394			3506	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	40	70	0	0	0	60	400	150	0	150	10
RTOR Reduction (vph)	0	62	0	0	0	0	0	45	0	0	5	0
Lane Group Flow (vph)	60	48	0	0	0	0	60	505	0	0	155	0
Turn Type	Split	NA					pm+pt	NA		Perm	NA	
Protected Phases	4	4					5	2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.4	6.4					37.6	37.6			28.1	
Effective Green, g (s)	6.4	6.4					37.6	37.6			28.1	
Actuated g/C Ratio	0.12	0.12					0.68	0.68			0.51	
Clearance Time (s)	5.5	5.5					5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	205	196					748	2320			1791	
v/s Ratio Prot	c0.03	0.03					0.01	c0.15			0.04	
v/s Ratio Perm							0.05					
v/c Ratio	0.29	0.25					0.08	0.22			0.09	
Uniform Delay, d1	22.2	22.1					3.1	3.2			6.9	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.8	0.7					0.0	0.2			0.1	
Delay (s)	23.0	22.8					3.2	3.4			7.0	
Level of Service	C	C					A	A			A	
Approach Delay (s)		22.9			0.0			3.4			7.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	10	10	20	350	10	200
v/c Ratio	0.40	0.01	0.02	0.02	0.13	0.01	0.08
Control Delay	43.7	0.0	0.0	3.5	4.5	3.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	0.0	0.0	3.5	4.5	3.7	4.4
Queue Length 50th (ft)	37	0	0	2	17	1	7
Queue Length 95th (ft)	77	0	0	10	76	7	37
Internal Link Dist (ft)		1256	713		1510		757
Turn Bay Length (ft)				150		250	
Base Capacity (vph)	178	1053	739	953	2788	849	2598
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.01	0.01	0.02	0.13	0.01	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	0	10	0	0	10	20	350	0	10	150	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3539		1770	3406	
Flt Permitted	0.60	1.00			1.00		0.61	1.00		0.54	1.00	
Satd. Flow (perm)	1112	1583			1611		1143	3539		1010	3406	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	0	10	0	0	10	20	350	0	10	150	50
RTOR Reduction (vph)	0	9	0	0	10	0	0	0	0	0	16	0
Lane Group Flow (vph)	70	1	0	0	0	0	20	350	0	10	184	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.5	12.5			1.2		71.2	68.6		68.4	67.2	
Effective Green, g (s)	12.5	12.5			1.2		71.2	68.6		68.4	67.2	
Actuated g/C Ratio	0.13	0.13			0.01		0.72	0.69		0.69	0.68	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	200			19		840	2457		708	2316	
v/s Ratio Prot	c0.02	0.00			0.00		c0.00	c0.10		0.00	0.05	
v/s Ratio Perm	c0.03						0.02			0.01		
v/c Ratio	0.39	0.01			0.01		0.02	0.14		0.01	0.08	
Uniform Delay, d1	39.3	37.7			48.2		3.9	5.1		4.7	5.3	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.0			0.1		0.0	0.1		0.0	0.1	
Delay (s)	40.7	37.7			48.3		3.9	5.2		4.7	5.4	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		40.3			48.3			5.2			5.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	50	125	200	175	70	90
v/c Ratio	0.20	0.20	0.24	0.13	0.09	0.12
Control Delay	21.2	3.1	4.6	4.0	11.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	3.1	4.6	4.0	11.2	1.5
Queue Length 50th (ft)	13	0	19	16	13	0
Queue Length 95th (ft)	37	22	42	37	35	10
Internal Link Dist (ft)	1895			1548	1510	
Turn Bay Length (ft)	180		100			
Base Capacity (vph)	595	725	845	1326	788	753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.17	0.24	0.13	0.09	0.12

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	50	125	200	175	70	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.56	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1049	1863	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	125	200	175	70	90
RTOR Reduction (vph)	0	79	0	0	0	53
Lane Group Flow (vph)	50	46	200	175	70	37
Turn Type	NA	pt+ov	pm+pt	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases	4		2			6
Actuated Green, G (s)	5.7	18.6	33.8	33.8	20.9	20.9
Effective Green, g (s)	5.7	18.6	33.8	33.8	20.9	20.9
Actuated g/C Ratio	0.11	0.37	0.67	0.67	0.41	0.41
Clearance Time (s)	5.5		5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	199	583	807	1246	771	655
v/s Ratio Prot	c0.03	0.03	c0.04	0.09	0.04	
v/s Ratio Perm			c0.13			0.02
v/c Ratio	0.25	0.08	0.25	0.14	0.09	0.06
Uniform Delay, d1	20.5	10.4	3.5	3.0	9.0	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.2	0.2	0.2	0.2
Delay (s)	21.1	10.4	3.6	3.3	9.2	9.0
Level of Service	C	B	A	A	A	A
Approach Delay (s)	13.5			3.5	9.1	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	0	50	0	0	0	100	1075	10	0	150	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	90	0	50	0	0	0	100	1075	10	0	150	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1435	1445	160	1480	1450	1080	170			1085		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1435	1445	160	1480	1450	1080	170			1085		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	15	100	94	100	100	100	93			100		
cM capacity (veh/h)	105	122	885	92	122	265	1407			643		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	140	0	100	1085	0	170
Volume Left	90	0	100	0	0	0
Volume Right	50	0	0	10	0	20
cSH	154	1700	1407	1700	1700	1700
Volume to Capacity	0.91	0.00	0.07	0.64	0.00	0.10
Queue Length 95th (ft)	161	0	6	0	0	0
Control Delay (s)	108.3	0.0	7.8	0.0	0.0	0.0
Lane LOS	F	A	A			
Approach Delay (s)	108.3	0.0	0.7		0.0	
Approach LOS	F	A				

Intersection Summary				
Average Delay	10.7			
Intersection Capacity Utilization	78.6%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	30	0	10	10	90	10	175	70	60	50	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	30	0	10	10	90	10	175	70	60	50	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	100	110	255	130
Volume Left (vph)	70	10	10	60
Volume Right (vph)	0	90	70	20
Hadj (s)	0.17	-0.44	-0.12	0.03
Departure Headway (s)	5.1	4.5	4.5	4.8
Degree Utilization, x	0.14	0.14	0.32	0.17
Capacity (veh/h)	641	722	769	707
Control Delay (s)	9.0	8.2	9.5	8.7
Approach Delay (s)	9.0	8.2	9.5	8.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay		9.0		
Level of Service		A		
Intersection Capacity Utilization		43.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	10	30	60	30	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	10	30	60	30	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	160	40	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	40	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	98			
cM capacity (veh/h)	815	1031	1557			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	40	90	50
Volume Left	30	30	0
Volume Right	10	0	20
cSH	860	1557	1700
Volume to Capacity	0.05	0.02	0.03
Queue Length 95th (ft)	4	1	0
Control Delay (s)	9.4	2.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	2.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	200	60	460	465
v/c Ratio	0.10	0.06	0.24	0.58
Control Delay	5.4	0.1	5.9	15.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.4	0.1	5.9	15.4
Queue Length 50th (ft)	11	0	29	43
Queue Length 95th (ft)	26	1	57	78
Internal Link Dist (ft)	412		676	814
Turn Bay Length (ft)				
Base Capacity (vph)	2062	982	1957	1402
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.06	0.24	0.33

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	200	60	10	450	425	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	1.00		0.95	0.97	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	1.00	1.00		1.00	0.96	
Satd. Flow (prot)	3539	1583		3535	3411	
Flt Permitted	1.00	1.00		0.95	0.96	
Satd. Flow (perm)	3539	1583		3359	3411	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	60	10	450	425	40
RTOR Reduction (vph)	0	25	0	0	116	0
Lane Group Flow (vph)	200	35	0	460	349	0
Turn Type	NA	Perm	pm+pt	NA	NA	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	29.6	29.6		29.6	10.1	
Effective Green, g (s)	29.6	29.6		29.6	10.1	
Actuated g/C Ratio	0.58	0.58		0.58	0.20	
Clearance Time (s)	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2066	924		1961	679	
v/s Ratio Prot	0.06				c0.10	
v/s Ratio Perm		0.02		c0.14		
v/c Ratio	0.10	0.04		0.23	0.51	
Uniform Delay, d1	4.7	4.5		5.1	18.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.7	
Delay (s)	4.7	4.6		5.1	18.8	
Level of Service	A	A		A	B	
Approach Delay (s)	4.7			5.1	18.8	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	50.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	30	10	20	10	90	10	300	70	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	30	10	20	10	90	10	300	70	10	30	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	470	445	35	400	380	300	40			370		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	470	445	35	400	380	300	40			370		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	94	99	96	98	88	99			99		
cM capacity (veh/h)	431	500	1038	524	544	740	1570			1189		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	50	120	310	70	50
Volume Left	10	20	10	0	10
Volume Right	10	90	0	70	10
cSH	539	673	1570	1700	1189
Volume to Capacity	0.09	0.18	0.01	0.04	0.01
Queue Length 95th (ft)	8	16	0	0	1
Control Delay (s)	12.4	11.5	0.3	0.0	1.7
Lane LOS	B	B	A		A
Approach Delay (s)	12.4	11.5	0.2		1.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	125	30	0	60	10	10	0	10	0	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	125	30	0	60	10	10	0	10	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	70			155			245	230	140	235	240	65
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	70			155			245	230	140	235	240	65
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	100	100	98
cM capacity (veh/h)	1531			1425			691	665	908	708	657	999

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	165	70	20	20
Volume Left	10	0	10	0
Volume Right	30	10	10	20
cSH	1531	1425	785	999
Volume to Capacity	0.01	0.00	0.03	0.02
Queue Length 95th (ft)	0	0	2	2
Control Delay (s)	0.5	0.0	9.7	8.7
Lane LOS	A		A	A
Approach Delay (s)	0.5	0.0	9.7	8.7
Approach LOS			A	A

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	70	10	0	125	125	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	10	0	125	125	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	275	150	175			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275	150	175			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	99	100			
cM capacity (veh/h)	715	896	1401			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	125	175
Volume Left	70	0	0
Volume Right	10	0	50
cSH	733	1401	1700
Volume to Capacity	0.11	0.00	0.10
Queue Length 95th (ft)	9	0	0
Control Delay (s)	10.5	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	20	80	20	0	60	0	10	10	0	0	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	80	20	0	60	0	10	10	0	0	10	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	60			100			225	200	60	195	190	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			100			225	200	60	195	190	90
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	99	100	100	99	97
cM capacity (veh/h)	1544			1493			693	687	1005	748	696	968

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	120	60	20	40
Volume Left	20	0	10	0
Volume Right	20	0	0	30
cSH	1544	1493	690	882
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	2	4
Control Delay (s)	1.3	0.0	10.4	9.3
Lane LOS	A		B	A
Approach Delay (s)	1.3	0.0	10.4	9.3
Approach LOS			B	A

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	27.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	20	50	1485	10	800
v/c Ratio	0.17	0.22	0.50	0.04	0.26
Control Delay	33.4	3.1	4.6	2.2	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	3.1	4.6	2.2	2.0
Queue Length 50th (ft)	9	0	98	1	40
Queue Length 95th (ft)	28	5	253	3	55
Internal Link Dist (ft)		619	983		468
Turn Bay Length (ft)				150	
Base Capacity (vph)	121	662	2943	273	3043
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.08	0.50	0.04	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	50	0	1475	10	10	800	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.5	5.5			5.5		5.5	5.5	
Lane Util. Factor				1.00	1.00			0.95		1.00	0.95	
Frt				1.00	0.85			1.00		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1770	1583			3536		1770	3539	
Flt Permitted				0.53	1.00			1.00		0.12	1.00	
Satd. Flow (perm)				980	1583			3536		219	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	20	0	50	0	1475	10	10	800	0
RTOR Reduction (vph)	0	0	0	0	45	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	20	5	0	0	1485	0	10	800	0
Turn Type	Perm			pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)				8.7	8.7			54.5		60.8	60.8	
Effective Green, g (s)				8.7	8.7			54.5		60.8	60.8	
Actuated g/C Ratio				0.11	0.11			0.68		0.76	0.76	
Clearance Time (s)				5.5	5.5			5.5		5.5	5.5	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				116	171			2393		180	2672	
v/s Ratio Prot				c0.00	0.00			c0.42		0.00	c0.23	
v/s Ratio Perm				c0.02						0.04		
v/c Ratio				0.17	0.03			0.62		0.06	0.30	
Uniform Delay, d1				32.5	32.1			7.2		5.0	3.1	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				0.7	0.1			1.2		0.1	0.3	
Delay (s)				33.2	32.2			8.5		5.1	3.4	
Level of Service				C	C			A		A	A	
Approach Delay (s)		0.0			32.5			8.5			3.4	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	80	70	30	100	915
v/c Ratio	0.31	0.20	0.07	0.04	0.41
Control Delay	22.7	1.8	4.4	4.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	1.8	4.4	4.0	8.4
Queue Length 50th (ft)	22	0	3	4	56
Queue Length 95th (ft)	53	5	10	12	162
Internal Link Dist (ft)	885			1507	983
Turn Bay Length (ft)			150		
Base Capacity (vph)	543	586	405	2493	2226
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.07	0.04	0.41

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	70	30	100	875	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3516	
Flt Permitted	0.95	1.00	0.24	1.00	1.00	
Satd. Flow (perm)	1770	1583	441	3539	3516	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	70	30	100	875	40
RTOR Reduction (vph)	0	62	0	0	4	0
Lane Group Flow (vph)	80	8	30	100	911	0
Turn Type	NA	custom	pm+pt	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	6.6	6.6	39.2	39.2	32.1	
Effective Green, g (s)	6.6	6.6	39.2	39.2	32.1	
Actuated g/C Ratio	0.12	0.12	0.69	0.69	0.57	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	205	183	341	2442	1987	
v/s Ratio Prot		0.01	c0.00	0.03	c0.26	
v/s Ratio Perm	c0.05		0.06			
v/c Ratio	0.39	0.04	0.09	0.04	0.46	
Uniform Delay, d1	23.2	22.3	3.5	2.8	7.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.1	0.1	0.0	0.8	
Delay (s)	24.5	22.4	3.6	2.8	8.0	
Level of Service	C	C	A	A	A	
Approach Delay (s)	23.5			3.0	8.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	250	80	100	1125	710
v/c Ratio	0.14	0.05	0.15	0.51	0.77
Control Delay	14.1	0.1	11.5	14.9	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	0.1	11.5	14.9	32.6
Queue Length 50th (ft)	40	0	31	215	167
Queue Length 95th (ft)	74	0	50	240	210
Internal Link Dist (ft)	496			698	342
Turn Bay Length (ft)		250	200		
Base Capacity (vph)	1798	1583	692	2225	1219
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.05	0.14	0.51	0.58

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	250	80	100	1125	650	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	3539	1583	1770	3539	3412	
Flt Permitted	1.00	1.00	0.53	1.00	0.96	
Satd. Flow (perm)	3539	1583	990	3539	3412	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	80	100	1125	650	60
RTOR Reduction (vph)	0	0	0	0	73	0
Lane Group Flow (vph)	250	80	100	1125	637	0
Turn Type	NA	Free	pm+pt	NA	NA	
Protected Phases	2		1	6	3	
Permitted Phases		Free	6			
Actuated Green, G (s)	44.6	90.0	56.6	56.6	22.4	
Effective Green, g (s)	44.6	90.0	56.6	56.6	22.4	
Actuated g/C Ratio	0.50	1.00	0.63	0.63	0.25	
Clearance Time (s)	5.5		5.5	5.5	5.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1753	1583	678	2225	849	
v/s Ratio Prot	0.07		0.01	c0.32	c0.19	
v/s Ratio Perm		0.05	0.08			
v/c Ratio	0.14	0.05	0.15	0.51	0.75	
Uniform Delay, d1	12.3	0.0	6.8	9.1	31.2	
Progression Factor	1.00	1.00	1.49	1.46	1.00	
Incremental Delay, d2	0.2	0.1	0.1	0.8	3.8	
Delay (s)	12.5	0.1	10.2	14.0	35.0	
Level of Service	B	A	B	B	C	
Approach Delay (s)	9.5			13.7	35.0	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	350	40	20	575	400	350
v/c Ratio	0.25	0.06	0.05	0.36	0.27	0.40
Control Delay	15.5	0.1	20.2	19.8	17.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	0.1	20.2	19.8	17.3	3.4
Queue Length 50th (ft)	48	0	6	92	73	0
Queue Length 95th (ft)	76	m0	m9	128	106	49
Internal Link Dist (ft)	698			585	318	
Turn Bay Length (ft)		350	350		150	150
Base Capacity (vph)	1399	684	453	1592	1468	877
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.06	0.04	0.36	0.27	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	350	40	20	575	400	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.45	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	834	3539	3433	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	40	20	575	400	350
RTOR Reduction (vph)	0	26	0	0	0	200
Lane Group Flow (vph)	350	14	20	575	400	150
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2	6			3
Actuated Green, G (s)	32.3	32.3	40.5	40.5	38.5	38.5
Effective Green, g (s)	32.3	32.3	40.5	40.5	38.5	38.5
Actuated g/C Ratio	0.36	0.36	0.45	0.45	0.43	0.43
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1270	568	403	1592	1468	677
v/s Ratio Prot	0.10		0.00	c0.16	c0.12	
v/s Ratio Perm		0.01	0.02			0.09
v/c Ratio	0.28	0.03	0.05	0.36	0.27	0.22
Uniform Delay, d1	20.5	18.7	14.0	16.3	16.7	16.3
Progression Factor	0.76	1.00	1.45	1.19	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.0	0.4	0.5	0.8
Delay (s)	16.1	18.7	20.4	19.7	17.1	17.0
Level of Service	B	B	C	B	B	B
Approach Delay (s)	16.4			19.7	17.1	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	250	445	10	725	550	200	150	225	50
v/c Ratio	0.89	0.27	0.12	0.78	0.57	0.84	0.21	0.91	0.14
Control Delay	77.4	18.2	44.6	38.5	4.3	67.9	12.8	76.2	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.4	18.2	44.6	38.5	4.3	67.9	12.8	76.2	13.4
Queue Length 50th (ft)	149	74	6	204	0	133	47	125	5
Queue Length 95th (ft)	#285	123	22	#282	61	m#197	m76	#259	34
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	285	1620	84	925	968	245	736	253	368
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.27	0.12	0.78	0.57	0.82	0.20	0.89	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	425	20	10	725	550	200	90	60	225	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.94		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3515		1770	3539	1583	1770	1751		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.66	1.00	
Satd. Flow (perm)	1770	3515		1770	3539	1583	1770	1751		1232	1639	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	425	20	10	725	550	200	90	60	225	10	40
RTOR Reduction (vph)	0	4	0	0	0	332	0	27	0	0	32	0
Lane Group Flow (vph)	250	441	0	10	725	218	200	123	0	225	18	0
Turn Type	Prot	NA		Prot	NA	custom	custom	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						8	3			4		
Actuated Green, G (s)	14.3	37.0		0.8	23.5	35.7	12.2	35.7		18.0	18.0	
Effective Green, g (s)	14.3	37.0		0.8	23.5	35.7	12.2	35.7		18.0	18.0	
Actuated g/C Ratio	0.16	0.41		0.01	0.26	0.40	0.14	0.40		0.20	0.20	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	1445		15	924	627	239	694		246	327	
v/s Ratio Prot	c0.14	0.13		0.01	c0.20		c0.11	0.07			0.01	
v/s Ratio Perm						0.14				c0.18		
v/c Ratio	0.89	0.31		0.67	0.78	0.35	0.84	0.18		0.91	0.06	
Uniform Delay, d1	37.1	17.8		44.5	30.9	19.0	37.9	17.6		35.2	29.1	
Progression Factor	1.23	1.12		1.00	1.00	1.00	1.04	1.00		1.00	1.00	
Incremental Delay, d2	26.3	0.5		75.9	6.6	0.3	21.4	0.1		35.1	0.1	
Delay (s)	71.7	20.6		120.3	37.5	19.3	60.9	17.8		70.3	29.2	
Level of Service	E	C		F	D	B	E	B		E	C	
Approach Delay (s)		39.0			30.4			42.4			62.8	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NWL
Lane Group Flow (vph)	20	1050	10	30	1985
v/c Ratio	0.02	0.67	0.03	0.03	0.97
Control Delay	26.2	2.5	22.9	22.8	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	2.5	22.9	22.8	32.1
Queue Length 50th (ft)	4	0	4	6	498
Queue Length 95th (ft)	14	17	16	16	#716
Internal Link Dist (ft)	917			636	2135
Turn Bay Length (ft)		300	200		
Base Capacity (vph)	966	1564	362	1042	2047
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.67	0.03	0.03	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	20	1050	10	30	1975	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	3539	1583	1770	3539	3440	
Flt Permitted	1.00	1.00	0.61	1.00	0.95	
Satd. Flow (perm)	3539	1583	1132	3539	3440	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1050	10	30	1975	10
RTOR Reduction (vph)	0	188	0	0	43	0
Lane Group Flow (vph)	20	862	10	30	1942	0
Turn Type	NA	pm+ov	pm+pt	NA	NA	
Protected Phases	2	4	1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	24.6	77.1	30.9	30.9	52.5	
Effective Green, g (s)	24.6	77.1	30.9	30.9	52.5	
Actuated g/C Ratio	0.26	0.82	0.33	0.33	0.56	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	922	1385	375	1158	1913	
v/s Ratio Prot	0.01	c0.35	0.00	c0.01	c0.56	
v/s Ratio Perm		0.20	0.01			
v/c Ratio	0.02	0.62	0.03	0.03	1.02	
Uniform Delay, d1	26.0	3.2	21.6	21.5	21.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.9	0.0	0.0	24.4	
Delay (s)	26.0	4.1	21.7	21.6	45.4	
Level of Service	C	A	C	C	D	
Approach Delay (s)	4.5			21.6	45.4	
Approach LOS	A			C	D	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBL	SBL	SBR
Lane Group Flow (vph)	525	100	90	20	30	20	10
v/c Ratio	0.85	0.12	0.38	0.06	0.07	0.05	0.01
Control Delay	39.3	3.2	34.3	0.3	17.9	17.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	3.2	34.3	0.3	17.9	17.8	0.0
Queue Length 50th (ft)	226	0	38	0	9	6	0
Queue Length 95th (ft)	#432	23	80	0	28	21	0
Internal Link Dist (ft)	468		451				
Turn Bay Length (ft)				180	180	180	180
Base Capacity (vph)	644	812	435	352	418	411	1055
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.12	0.21	0.06	0.07	0.05	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	500	100	0	90	20	30	0	0	20	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5	5.5	5.5			5.5		5.5
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00			1.00		1.00
Frt		1.00	0.85		1.00	0.85	1.00			1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00	0.95			0.95		1.00
Satd. Flow (prot)		1858	1583		1863	1583	1770			1770		1583
Flt Permitted		1.00	1.00		1.00	1.00	0.72			0.76		1.00
Satd. Flow (perm)		1858	1583		1863	1583	1347			1410		1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	500	100	0	90	20	30	0	0	20	0	10
RTOR Reduction (vph)	0	0	64	0	0	17	0	0	0	0	0	8
Lane Group Flow (vph)	0	525	36	0	90	3	30	0	0	20	0	2
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt		Perm	pm+pt		Perm
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2		2	6		6
Actuated Green, G (s)		23.0	26.0		7.2	9.4	20.9			19.3		17.1
Effective Green, g (s)		23.0	26.0		7.2	9.4	20.9			19.3		17.1
Actuated g/C Ratio		0.32	0.36		0.10	0.13	0.29			0.27		0.24
Clearance Time (s)		5.5	5.5		5.5	5.5	5.5			5.5		5.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0			3.0		3.0
Lane Grp Cap (vph)		591	689		185	205	406			387		374
v/s Ratio Prot		c0.28	c0.00		c0.05	0.00	0.00			0.00		
v/s Ratio Perm			0.02			0.00	c0.02			0.01		0.00
v/c Ratio		0.89	0.05		0.49	0.01	0.07			0.05		0.01
Uniform Delay, d1		23.4	15.1		30.8	27.4	18.6			19.6		21.1
Progression Factor		1.00	1.00		1.00	1.00	1.00			1.00		1.00
Incremental Delay, d2		15.1	0.0		2.0	0.0	0.1			0.1		0.0
Delay (s)		38.5	15.1		32.8	27.4	18.7			19.7		21.1
Level of Service		D	B		C	C	B			B		C
Approach Delay (s)		34.8			31.8			18.7			20.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	40	175	60	2550	90	1310
v/c Ratio	0.22	0.95	0.24	1.02	0.68	0.46
Control Delay	9.3	118.0	15.8	43.2	51.0	5.3
Queue Delay	0.0	0.0	0.0	33.6	0.0	0.0
Total Delay	9.3	118.0	15.8	76.8	51.0	5.3
Queue Length 50th (ft)	0	173	0	~1381	36	181
Queue Length 95th (ft)	21	#328	45	#1501	#115	212
Internal Link Dist (ft)	1063	844		730		672
Turn Bay Length (ft)			150		350	
Base Capacity (vph)	178	184	251	2512	135	2830
Starvation Cap Reductn	0	0	0	269	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.95	0.24	1.14	0.67	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	20	175	0	60	0	2375	175	90	1300	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	5.5		5.5		5.5	5.5	
Lane Util. Factor		1.00			1.00	1.00		0.95		1.00	0.95	
Frt		0.93			1.00	0.85		0.99		1.00	1.00	
Flt Protected		0.98			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1695			1770	1583		3503		1770	3535	
Flt Permitted		0.58			0.79	1.00		1.00		0.04	1.00	
Satd. Flow (perm)		1014			1466	1583		3503		66	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	0	20	175	0	60	0	2375	175	90	1300	10
RTOR Reduction (vph)	0	35	0	0	0	52	0	4	0	0	0	0
Lane Group Flow (vph)	0	5	0	0	175	8	0	2546	0	90	1310	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		18.9			18.9	18.9		107.3		120.0	120.0	
Effective Green, g (s)		18.9			18.9	18.9		107.3		120.0	120.0	
Actuated g/C Ratio		0.13			0.13	0.13		0.72		0.80	0.80	
Clearance Time (s)		5.5			5.5	5.5		5.5		5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		127			184	199		2507		134	2829	
v/s Ratio Prot								c0.73		c0.03	0.37	
v/s Ratio Perm		0.00			c0.12	0.00				0.50		
v/c Ratio		0.04			0.95	0.04		1.02		0.67	0.46	
Uniform Delay, d1		57.5			65.0	57.5		21.3		50.9	4.7	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			52.0	0.1		22.0		12.5	0.5	
Delay (s)		57.7			117.1	57.6		43.3		63.4	5.3	
Level of Service		E			F	E		D		E	A	
Approach Delay (s)		57.7			101.9			43.3			9.0	
Approach LOS		E			F			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	149.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	20	215	10	2240	30	1610
v/c Ratio	0.13	0.07	0.80	0.05	0.92	0.20	0.62
Control Delay	38.2	0.5	46.0	4.3	22.8	6.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	0.5	46.0	4.3	22.8	6.9	8.9
Queue Length 50th (ft)	11	0	77	1	666	4	217
Queue Length 95th (ft)	33	0	#179	6	#932	12	416
Internal Link Dist (ft)		768	686		522		730
Turn Bay Length (ft)	150			150		150	
Base Capacity (vph)	187	353	314	213	2433	149	2580
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.06	0.68	0.05	0.92	0.20	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	20	125	0	90	10	2150	90	30	1600	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.94		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1708		1770	3518		1770	3536	
Flt Permitted	0.59	1.00			0.81		0.11	1.00		0.06	1.00	
Satd. Flow (perm)	1101	1583			1423		205	3518		107	3536	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	0	20	125	0	90	10	2150	90	30	1600	10
RTOR Reduction (vph)	0	17	0	0	76	0	0	3	0	0	0	0
Lane Group Flow (vph)	20	3	0	0	139	0	10	2237	0	30	1610	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.0	13.0			13.0		69.1	68.3		72.3	69.9	
Effective Green, g (s)	13.0	13.0			13.0		69.1	68.3		72.3	69.9	
Actuated g/C Ratio	0.13	0.13			0.13		0.69	0.68		0.72	0.70	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	205			184		153	2397		117	2466	
v/s Ratio Prot		0.00					0.00	c0.64		c0.01	0.46	
v/s Ratio Perm	0.02				c0.10		0.04			0.18		
v/c Ratio	0.14	0.01			0.76		0.07	0.93		0.26	0.65	
Uniform Delay, d1	38.6	38.0			42.1		6.9	14.0		20.9	8.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			16.2		0.2	7.5		1.2	0.6	
Delay (s)	39.1	38.0			58.3		7.1	21.4		22.0	9.0	
Level of Service	D	D			E		A	C		C	A	
Approach Delay (s)		38.6			58.3			21.4			9.3	
Approach LOS		D			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	20	550	1595	225	725
v/c Ratio	0.05	1.01	0.97	0.87	0.33
Control Delay	26.1	63.7	40.0	51.2	8.3
Queue Delay	0.0	0.0	16.2	0.0	0.0
Total Delay	26.1	63.7	56.2	51.2	8.3
Queue Length 50th (ft)	9	~219	445	75	91
Queue Length 95th (ft)	27	#438	#621	#206	122
Internal Link Dist (ft)	564		468		791
Turn Bay Length (ft)				150	
Base Capacity (vph)	442	546	1649	259	2221
Starvation Cap Reductn	0	0	108	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	1.01	1.04	0.87	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	550	1575	20	225	725
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3533		1770	3539
Flt Permitted	0.95	1.00	1.00		0.08	1.00
Satd. Flow (perm)	1770	1583	3533		157	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	550	1575	20	225	725
RTOR Reduction (vph)	0	151	1	0	0	0
Lane Group Flow (vph)	20	399	1594	0	225	725
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	22.5	22.5	42.0		56.5	56.5
Effective Green, g (s)	22.5	22.5	42.0		56.5	56.5
Actuated g/C Ratio	0.25	0.25	0.47		0.63	0.63
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	442	395	1648		259	2221
v/s Ratio Prot	0.01	c0.25	c0.45		c0.09	0.20
v/s Ratio Perm					0.46	
v/c Ratio	0.05	1.01	0.97		0.87	0.33
Uniform Delay, d1	25.6	33.8	23.3		25.0	7.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	48.0	15.0		25.1	0.1
Delay (s)	25.6	81.8	38.3		50.0	7.9
Level of Service	C	F	D		D	A
Approach Delay (s)	79.8		38.3			17.9
Approach LOS	E		D			B

Intersection Summary			
HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	20	100	1005	125	900
v/c Ratio	0.08	0.29	0.52	0.31	0.35
Control Delay	20.2	4.6	11.0	5.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	4.6	11.0	5.5	4.1
Queue Length 50th (ft)	5	0	110	10	48
Queue Length 95th (ft)	20	19	171	25	80
Internal Link Dist (ft)	1291		1285		1507
Turn Bay Length (ft)				100	
Base Capacity (vph)	645	669	1967	400	2573
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.15	0.51	0.31	0.35

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	100	975	30	125	900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3523		1770	3539
Flt Permitted	0.95	1.00	1.00		0.18	1.00
Satd. Flow (perm)	1770	1583	3523		343	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	100	975	30	125	900
RTOR Reduction (vph)	0	90	3	0	0	0
Lane Group Flow (vph)	20	10	1002	0	125	900
Turn Type	NA	Prot	NA		pm+pt	NA
Protected Phases	8	8	2		1	6
Permitted Phases					6	
Actuated Green, G (s)	4.7	4.7	23.8		33.1	33.1
Effective Green, g (s)	4.7	4.7	23.8		33.1	33.1
Actuated g/C Ratio	0.10	0.10	0.49		0.68	0.68
Clearance Time (s)	5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	170	152	1718		343	2400
v/s Ratio Prot	c0.01	0.01	c0.28		0.03	c0.25
v/s Ratio Perm					0.22	
v/c Ratio	0.12	0.06	0.58		0.36	0.38
Uniform Delay, d1	20.2	20.0	8.9		4.2	3.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.2	0.5		0.7	0.1
Delay (s)	20.5	20.2	9.5		4.8	3.5
Level of Service	C	C	A		A	A
Approach Delay (s)	20.3		9.5			3.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	150	60	90	200	325	175	375	60	175	225	325
v/c Ratio	0.57	0.44	0.12	0.29	0.68	0.46	0.32	0.58	0.07	0.42	0.33	0.41
Control Delay	41.1	38.1	1.6	34.5	47.0	6.4	14.6	28.3	0.1	15.5	22.3	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	38.1	1.6	34.5	47.0	6.4	14.6	28.3	0.1	15.5	22.3	4.3
Queue Length 50th (ft)	108	79	0	44	105	14	51	172	0	51	90	0
Queue Length 95th (ft)	174	133	8	88	176	73	92	272	0	92	153	54
Internal Link Dist (ft)		676			1895			1533			1285	
Turn Bay Length (ft)	180			400		70	180		90			150
Base Capacity (vph)	349	490	514	311	356	717	541	651	861	433	684	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.31	0.12	0.29	0.56	0.45	0.32	0.58	0.07	0.40	0.33	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	150	60	90	200	325	175	375	60	175	225	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.60	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1863	1863	1583	1863	1863	1583	1118	1863	1583	650	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	150	60	90	200	325	175	375	60	175	225	325
RTOR Reduction (vph)	0	0	44	0	0	210	0	0	32	0	0	207
Lane Group Flow (vph)	200	150	16	90	200	115	175	375	28	175	225	118
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	15.8	15.8	23.0	14.8	14.8	23.6	37.4	30.2	41.0	40.6	31.8	31.8
Effective Green, g (s)	15.8	15.8	23.0	14.8	14.8	23.6	37.4	30.2	41.0	40.6	31.8	31.8
Actuated g/C Ratio	0.18	0.18	0.26	0.17	0.17	0.27	0.43	0.34	0.47	0.46	0.36	0.36
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	336	336	415	314	314	525	530	642	740	413	676	574
v/s Ratio Prot	0.08	0.08	0.00	0.04	c0.11	0.02	0.03	c0.20	0.00	c0.04	0.12	
v/s Ratio Perm	c0.03		0.01	0.01		0.05	0.11		0.01	0.15		0.07
v/c Ratio	0.60	0.45	0.04	0.29	0.64	0.22	0.33	0.58	0.04	0.42	0.33	0.21
Uniform Delay, d1	33.2	32.0	24.1	31.8	33.9	24.8	16.0	23.5	12.6	14.9	20.2	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	0.9	0.0	0.5	4.2	0.2	0.4	3.9	0.0	0.7	1.3	0.8
Delay (s)	36.0	32.9	24.1	32.3	38.1	25.1	16.3	27.4	12.6	15.6	21.5	20.0
Level of Service	D	C	C	C	D	C	B	C	B	B	C	C
Approach Delay (s)		33.1			30.4			22.8			19.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	150	20	285	40	140
v/c Ratio	0.37	0.41	0.02	0.22	0.05	0.11
Control Delay	19.3	10.9	4.0	4.4	4.1	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	10.9	4.0	4.4	4.1	3.2
Queue Length 50th (ft)	21	11	2	25	3	8
Queue Length 95th (ft)	53	48	8	61	13	26
Internal Link Dist (ft)	1109	935		718		1533
Turn Bay Length (ft)			100		410	
Base Capacity (vph)	736	835	870	1297	762	1259
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.18	0.02	0.22	0.05	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	50	10	10	40	100	20	275	10	40	100	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.91		1.00	0.99		1.00	0.96	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1802			1689		1770	1853		1770	1783	
Flt Permitted		0.84			0.97		0.67	1.00		0.59	1.00	
Satd. Flow (perm)		1539			1645		1244	1853		1090	1783	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	50	10	10	40	100	20	275	10	40	100	40
RTOR Reduction (vph)	0	9	0	0	85	0	0	1	0	0	13	0
Lane Group Flow (vph)	0	91	0	0	65	0	20	284	0	40	127	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.0			7.0		32.2	32.2		32.2	32.2	
Effective Green, g (s)		7.0			7.0		32.2	32.2		32.2	32.2	
Actuated g/C Ratio		0.15			0.15		0.67	0.67		0.67	0.67	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		223			238		831	1237		728	1191	
v/s Ratio Prot								c0.15			0.07	
v/s Ratio Perm		c0.06			0.04		0.02			0.04		
v/c Ratio		0.41			0.27		0.02	0.23		0.05	0.11	
Uniform Delay, d1		18.7			18.3		2.7	3.1		2.8	2.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			0.6		0.1	0.4		0.1	0.2	
Delay (s)		20.0			18.9		2.8	3.6		2.9	3.0	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		20.0			18.9			3.5			3.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	20	30	0	30	10	300	150	10	20	60	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	20	30	0	30	10	300	150	10	20	60	10

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	50	40	450	10	90
Volume Left (vph)	0	0	300	0	20
Volume Right (vph)	30	10	0	10	10
Hadj (s)	-0.33	-0.12	0.37	-0.67	0.01
Departure Headway (s)	5.0	5.3	5.2	4.2	4.8
Degree Utilization, x	0.07	0.06	0.65	0.01	0.12
Capacity (veh/h)	637	609	686	846	715
Control Delay (s)	8.4	8.6	16.0	6.0	8.5
Approach Delay (s)	8.4	8.6	15.8		8.5
Approach LOS	A	A	C		A

Intersection Summary				
Delay	13.8			
Level of Service	B			
Intersection Capacity Utilization	41.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	10	50	425	125	30	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	50	425	125	30	20

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	60	550	50
Volume Left (vph)	10	0	30
Volume Right (vph)	50	125	0
Hadj (s)	-0.43	-0.10	0.15
Departure Headway (s)	4.7	4.0	4.7
Degree Utilization, x	0.08	0.61	0.07
Capacity (veh/h)	672	887	724
Control Delay (s)	8.1	13.1	8.1
Approach Delay (s)	8.1	13.1	8.1
Approach LOS	A	B	A

Intersection Summary			
Delay	12.3		
Level of Service	B		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay (sec/veh)	9.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	2	2
Conflicting Circle Lanes	2	2	2	2
Adjusted Approach Flow (vph)	460	20	530	170
Demand Flow Rate (pc/h)	470	20	541	173
Vehicles Circulating (pc/h)	112	841	351	61
Vehicles Exiting (pc/h)	122	51	229	800
Follow-Up Headway (s)	3.186	3.186	3.186	3.186
Ped Vol. Crossing Leg (#/hr)	0	0	0	0
Ped Capacity Adjustment	1.000	1.000	1.000	1.000
Approach Delay (sec/veh)	8.6	6.1	11.3	4.7
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Right	Left	Right
Designated moves	LTR	LTR	L	TR	L	TR
Assumed Moves	LTR	LTR	L	TR	L	TR
Right Turn Channelized						
Lane Utilization	1.000	1.000	0.094	0.906	0.058	0.942
Critical Headway (s)	4.113	4.113	4.293	4.113	4.293	4.113
Entry Flow Rate (pc/h)	470	20	51	490	10	163
Capacity, Entry Lane (pc/h)	1045	627	868	884	1079	1083
Entry HV Adjustment Factor	0.978	1.000	0.980	0.980	1.000	0.983
Flow Rate, Entry (vph)	460	20	50	480	10	160
Capacity, Entry (vph)	1022	627	851	866	1079	1064
Volume to Capacity Ratio	0.450	0.032	0.059	0.554	0.009	0.151
Control Delay (sec/veh)	8.6	6.1	4.8	12.0	3.4	4.7
Level of Service	A	A	A	B	A	A
95th-Percentile Queue (veh)	2	0	0	3	0	1

Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	60	110	60	550	160
v/c Ratio	0.27	0.40	0.07	0.21	0.07
Control Delay	25.8	15.3	3.7	2.8	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	15.3	3.7	2.8	7.7
Queue Length 50th (ft)	20	13	5	21	13
Queue Length 95th (ft)	47	50	17	44	31
Internal Link Dist (ft)		834		757	1195
Turn Bay Length (ft)	150		200		
Base Capacity (vph)	516	541	829	2560	2187
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.20	0.07	0.21	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	40	70	0	0	0	60	400	150	0	150	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5					5.5	5.5			5.5	
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	
Frt	1.00	0.90					1.00	0.96			0.99	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1770	1685					1770	3394			3506	
Flt Permitted	0.95	1.00					0.56	1.00			1.00	
Satd. Flow (perm)	1770	1685					1038	3394			3506	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	40	70	0	0	0	60	400	150	0	150	10
RTOR Reduction (vph)	0	62	0	0	0	0	0	40	0	0	5	0
Lane Group Flow (vph)	60	48	0	0	0	0	60	510	0	0	155	0
Turn Type	Split	NA					pm+pt	NA		Perm	NA	
Protected Phases	4	4					5	2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.6	6.6					42.4	42.4			32.9	
Effective Green, g (s)	6.6	6.6					42.4	42.4			32.9	
Actuated g/C Ratio	0.11	0.11					0.71	0.71			0.55	
Clearance Time (s)	5.5	5.5					5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	194	185					782	2398			1922	
v/s Ratio Prot	c0.03	0.03					0.01	c0.15			0.04	
v/s Ratio Perm							0.05					
v/c Ratio	0.31	0.26					0.08	0.21			0.08	
Uniform Delay, d1	24.6	24.5					2.9	3.0			6.4	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.9	0.7					0.0	0.2			0.1	
Delay (s)	25.5	25.2					3.0	3.2			6.5	
Level of Service	C	C					A	A			A	
Approach Delay (s)		25.3			0.0			3.2			6.5	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	10	10	20	385	10	200
v/c Ratio	0.40	0.01	0.02	0.02	0.14	0.01	0.08
Control Delay	43.6	0.0	0.0	3.5	4.5	3.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	0.0	0.0	3.5	4.5	3.7	4.4
Queue Length 50th (ft)	37	0	0	2	19	1	7
Queue Length 95th (ft)	77	0	0	10	83	7	37
Internal Link Dist (ft)		1256	713		1510		757
Turn Bay Length (ft)				150		250	
Base Capacity (vph)	178	1054	723	953	2777	826	2597
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.01	0.01	0.02	0.14	0.01	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	0	10	0	0	10	20	375	10	10	150	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1611		1770	3525		1770	3406	
Flt Permitted	0.60	1.00			1.00		0.61	1.00		0.52	1.00	
Satd. Flow (perm)	1112	1583			1611		1143	3525		976	3406	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	0	10	0	0	10	20	375	10	10	150	50
RTOR Reduction (vph)	0	9	0	0	10	0	0	1	0	0	16	0
Lane Group Flow (vph)	70	1	0	0	0	0	20	384	0	10	184	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.5	12.5			1.2		71.1	68.5		68.3	67.1	
Effective Green, g (s)	12.5	12.5			1.2		71.1	68.5		68.3	67.1	
Actuated g/C Ratio	0.13	0.13			0.01		0.72	0.69		0.69	0.68	
Clearance Time (s)	5.5	5.5			5.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	200			19		839	2446		685	2315	
v/s Ratio Prot	c0.02	0.00			0.00		c0.00	c0.11		0.00	0.05	
v/s Ratio Perm	c0.03						0.02			0.01		
v/c Ratio	0.39	0.01			0.01		0.02	0.16		0.01	0.08	
Uniform Delay, d1	39.2	37.7			48.2		3.9	5.2		4.7	5.3	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.0			0.1		0.0	0.1		0.0	0.1	
Delay (s)	40.6	37.7			48.3		3.9	5.3		4.7	5.4	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		40.3			48.3			5.3			5.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	125	80	250	275	40	125
v/c Ratio	0.40	0.12	0.31	0.21	0.06	0.18
Control Delay	23.3	2.8	6.0	5.3	13.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	2.8	6.0	5.3	13.1	3.3
Queue Length 50th (ft)	35	0	28	31	8	0
Queue Length 95th (ft)	74	16	66	71	27	24
Internal Link Dist (ft)	1895			1548	1510	
Turn Bay Length (ft)	180		100			
Base Capacity (vph)	592	761	836	1282	720	700
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.11	0.30	0.21	0.06	0.18

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	125	80	250	275	40	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.57	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1062	1863	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	80	250	275	40	125
RTOR Reduction (vph)	0	47	0	0	0	78
Lane Group Flow (vph)	125	33	250	275	40	47
Turn Type	NA	pt+ov	pm+pt	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases	4		2			6
Actuated Green, G (s)	7.4	21.0	33.1	33.1	19.5	19.5
Effective Green, g (s)	7.4	21.0	33.1	33.1	19.5	19.5
Actuated g/C Ratio	0.14	0.41	0.64	0.64	0.38	0.38
Clearance Time (s)	5.5		5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	254	645	793	1197	705	599
v/s Ratio Prot	c0.07	0.02	c0.05	0.15	0.02	
v/s Ratio Perm			c0.15			0.03
v/c Ratio	0.49	0.05	0.32	0.23	0.06	0.08
Uniform Delay, d1	20.3	9.2	4.2	3.9	10.2	10.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.0	0.2	0.4	0.2	0.3
Delay (s)	21.8	9.3	4.4	4.3	10.3	10.5
Level of Service	C	A	A	A	B	B
Approach Delay (s)	16.9			4.4	10.5	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	0	50	0	0	0	125	1275	10	0	175	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	100	0	50	0	0	0	125	1275	10	0	175	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1710	1720	185	1755	1725	1280	195			1285		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1710	1720	185	1755	1725	1280	195			1285		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	94	100	100	100	91			100		
cM capacity (veh/h)	67	81	857	58	81	202	1378			540		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	150	0	125	1285	0	195
Volume Left	100	0	125	0	0	0
Volume Right	50	0	0	10	0	20
cSH	96	1700	1378	1700	1700	1700
Volume to Capacity	1.56	0.00	0.09	0.76	0.00	0.11
Queue Length 95th (ft)	290	0	7	0	0	0
Control Delay (s)	373.7	0.0	7.9	0.0	0.0	0.0
Lane LOS	F	A	A			
Approach Delay (s)	373.7	0.0	0.7		0.0	
Approach LOS	F	A				

Intersection Summary				
Average Delay	32.5			
Intersection Capacity Utilization	89.6%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	80	40	0	10	20	100	10	200	70	70	60	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	80	40	0	10	20	100	10	200	70	70	60	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	120	130	280	150
Volume Left (vph)	80	10	10	70
Volume Right (vph)	0	100	70	20
Hadj (s)	0.17	-0.41	-0.11	0.05
Departure Headway (s)	5.3	4.7	4.6	5.0
Degree Utilization, x	0.18	0.17	0.36	0.21
Capacity (veh/h)	616	686	737	676
Control Delay (s)	9.4	8.7	10.2	9.2
Approach Delay (s)	9.4	8.7	10.2	9.2
Approach LOS	A	A	B	A

Intersection Summary			
Delay	9.6		
Level of Service	A		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	10	30	60	30	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	10	30	60	30	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	160	40	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	40	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	98			
cM capacity (veh/h)	815	1031	1557			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	40	90	50
Volume Left	30	30	0
Volume Right	10	0	20
cSH	860	1557	1700
Volume to Capacity	0.05	0.02	0.03
Queue Length 95th (ft)	4	1	0
Control Delay (s)	9.4	2.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	2.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	225	70	485	500
v/c Ratio	0.11	0.07	0.25	0.60
Control Delay	5.8	0.3	6.4	15.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.8	0.3	6.4	15.8
Queue Length 50th (ft)	13	0	32	48
Queue Length 95th (ft)	32	3	66	85
Internal Link Dist (ft)	412		676	814
Turn Bay Length (ft)				
Base Capacity (vph)	2031	970	1928	1382
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.07	0.25	0.36

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	225	70	10	475	450	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	
Lane Util. Factor	0.95	1.00		0.95	0.97	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	1.00	1.00		1.00	0.96	
Satd. Flow (prot)	3539	1583		3536	3406	
Flt Permitted	1.00	1.00		0.95	0.96	
Satd. Flow (perm)	3539	1583		3359	3406	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	70	10	475	450	50
RTOR Reduction (vph)	0	30	0	0	114	0
Lane Group Flow (vph)	225	40	0	485	386	0
Turn Type	NA	Perm	pm+pt	NA	NA	
Protected Phases	2		1	6	4	
Permitted Phases		2	6			
Actuated Green, G (s)	29.6	29.6		29.6	10.9	
Effective Green, g (s)	29.6	29.6		29.6	10.9	
Actuated g/C Ratio	0.57	0.57		0.57	0.21	
Clearance Time (s)	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	2034	909		1930	720	
v/s Ratio Prot	0.06				c0.11	
v/s Ratio Perm		0.03		c0.14		
v/c Ratio	0.11	0.04		0.25	0.54	
Uniform Delay, d1	5.0	4.8		5.4	18.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.8	
Delay (s)	5.1	4.9		5.5	18.8	
Level of Service	A	A		A	B	
Approach Delay (s)	5.0			5.5	18.8	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	30	10	20	10	90	10	300	70	10	30	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	30	10	20	10	90	10	300	70	10	30	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	470	445	35	400	380	300	40			370		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	470	445	35	400	380	300	40			370		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	94	99	96	98	88	99			99		
cM capacity (veh/h)	431	500	1038	524	544	740	1570			1189		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	50	120	310	70	50
Volume Left	10	20	10	0	10
Volume Right	10	90	0	70	10
cSH	539	673	1570	1700	1189
Volume to Capacity	0.09	0.18	0.01	0.04	0.01
Queue Length 95th (ft)	8	16	0	0	1
Control Delay (s)	12.4	11.5	0.3	0.0	1.7
Lane LOS	B	B	A		A
Approach Delay (s)	12.4	11.5	0.2		1.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	150	30	10	70	10	10	0	10	0	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	150	30	10	70	10	10	0	10	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			180			300	285	165	290	295	75
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			180			300	285	165	290	295	75
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	100	99	100	100	98
cM capacity (veh/h)	1518			1396			632	616	879	648	608	986

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	190	90	20	20
Volume Left	10	10	10	0
Volume Right	30	10	10	20
cSH	1518	1396	736	986
Volume to Capacity	0.01	0.01	0.03	0.02
Queue Length 95th (ft)	0	1	2	2
Control Delay (s)	0.4	0.9	10.0	8.7
Lane LOS	A	A	B	A
Approach Delay (s)	0.4	0.9	10.0	8.7
Approach LOS			B	A

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	26.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	70	10	0	125	150	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	10	0	125	150	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	300	175	200			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	300	175	200			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	99	100			
cM capacity (veh/h)	691	868	1372			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	125	200
Volume Left	70	0	0
Volume Right	10	0	50
cSH	710	1372	1700
Volume to Capacity	0.11	0.00	0.12
Queue Length 95th (ft)	9	0	0
Control Delay (s)	10.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.7	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	20	90	20	0	60	0	10	10	0	0	10	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	90	20	0	60	0	10	10	0	0	10	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	60			110			235	210	60	205	200	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			110			235	210	60	205	200	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	99	100	100	99	97
cM capacity (veh/h)	1544			1480			682	678	1005	737	687	956

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	130	60	20	40
Volume Left	20	0	10	0
Volume Right	20	0	0	30
cSH	1544	1480	680	870
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	2	4
Control Delay (s)	1.2	0.0	10.5	9.3
Lane LOS	A		B	A
Approach Delay (s)	1.2	0.0	10.5	9.3
Approach LOS			B	A

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	28.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	20	30	50	1510	10	750
v/c Ratio	0.06	0.18	0.18	0.54	0.04	0.26
Control Delay	0.4	27.8	1.4	6.9	3.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	27.8	1.4	6.9	3.8	3.2
Queue Length 50th (ft)	0	11	0	101	1	36
Queue Length 95th (ft)	0	33	2	378	6	96
Internal Link Dist (ft)	670		619	983		468
Turn Bay Length (ft)					150	
Base Capacity (vph)	571	163	712	2819	252	2911
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.18	0.07	0.54	0.04	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	10	30	0	50	0	1500	10	10	750	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		5.5	5.5			5.5		5.5	5.5	
Lane Util. Factor		1.00		1.00	1.00			0.95		1.00	0.95	
Frt		0.93		1.00	0.85			1.00		1.00	1.00	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1695		1770	1583			3536		1770	3539	
Flt Permitted		1.00		0.63	1.00			1.00		0.10	1.00	
Satd. Flow (perm)		1737		1172	1583			3536		194	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	0	10	30	0	50	0	1500	10	10	750	0
RTOR Reduction (vph)	0	19	0	0	44	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1	0	30	6	0	0	1510	0	10	750	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		2.0		9.4	9.4			48.1		54.3	54.3	
Effective Green, g (s)		2.0		9.4	9.4			48.1		54.3	54.3	
Actuated g/C Ratio		0.03		0.13	0.13			0.64		0.73	0.73	
Clearance Time (s)		5.5		5.5	5.5			5.5		5.5	5.5	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		46		162	199			2276		155	2572	
v/s Ratio Prot				c0.00	0.00			c0.43		0.00	c0.21	
v/s Ratio Perm		0.00		c0.02						0.05		
v/c Ratio		0.01		0.19	0.03			0.66		0.06	0.29	
Uniform Delay, d1		35.4		29.1	28.7			8.3		5.9	3.5	
Progression Factor		1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.1		0.6	0.1			1.5		0.2	0.3	
Delay (s)		35.5		29.7	28.7			9.8		6.0	3.8	
Level of Service		D		C	C			A		A	A	
Approach Delay (s)		35.5			29.1			9.8			3.9	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	80	70	30	1100	865
v/c Ratio	0.31	0.20	0.07	0.44	0.39
Control Delay	22.4	1.8	4.3	5.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	1.8	4.3	5.5	8.4
Queue Length 50th (ft)	22	0	3	73	52
Queue Length 95th (ft)	52	5	11	128	153
Internal Link Dist (ft)	885			1507	983
Turn Bay Length (ft)			150		
Base Capacity (vph)	561	601	433	2485	2205
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.12	0.07	0.44	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	70	30	1100	825	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3515	
Flt Permitted	0.95	1.00	0.25	1.00	1.00	
Satd. Flow (perm)	1770	1583	471	3539	3515	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	70	30	1100	825	40
RTOR Reduction (vph)	0	62	0	0	4	0
Lane Group Flow (vph)	80	8	30	1100	861	0
Turn Type	NA	custom	pm+pt	NA	NA	
Protected Phases		4	5	2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	6.6	6.6	38.8	38.8	31.5	
Effective Green, g (s)	6.6	6.6	38.8	38.8	31.5	
Actuated g/C Ratio	0.12	0.12	0.69	0.69	0.56	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	207	185	365	2434	1963	
v/s Ratio Prot		0.01	0.00	c0.31	0.24	
v/s Ratio Perm	c0.05		0.05			
v/c Ratio	0.39	0.04	0.08	0.45	0.44	
Uniform Delay, d1	23.0	22.1	3.5	4.0	7.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.1	0.1	0.6	0.7	
Delay (s)	24.2	22.2	3.6	4.6	8.0	
Level of Service	C	C	A	A	A	
Approach Delay (s)	23.3			4.6	8.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	60	3750	20	40	825	125	30	10	125	80	20
v/c Ratio	0.72	0.90	0.02	0.73	0.20	0.10	0.28	0.07	0.69	0.77	0.05
Control Delay	180.5	23.5	5.8	195.8	7.3	1.0	133.1	125.0	84.0	173.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.5	23.5	5.8	195.8	7.3	1.0	133.1	125.0	84.0	173.4	0.2
Queue Length 50th (ft)	118	1739	7	79	130	0	56	19	121	157	0
Queue Length 95th (ft)	192	1941	17	#161	178	20	105	47	216	238	0
Internal Link Dist (ft)		1472			1818			850			
Turn Bay Length (ft)	520		380	380		400	55		65	270	280
Base Capacity (vph)	108	4165	1292	60	4086	1291	187	247	265	180	468
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.90	0.02	0.67	0.20	0.10	0.16	0.04	0.47	0.44	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	3750	20	40	825	125	30	10	125	80	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5085	1577	1770	5085	1577	1770	1863	1583	1711		1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.76	1.00	1.00	0.75		1.00
Satd. Flow (perm)	1770	5085	1577	1770	5085	1577	1410	1863	1583	1352		1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	3750	20	40	825	125	30	10	125	80	0	20
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	58	0	0	18
Lane Group Flow (vph)	60	3750	20	40	825	100	30	10	67	80	0	2
Bus Blockages (#/hr)	0	0	1	0	0	1	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm		Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4		4	8		8
Actuated Green, G (s)	13.8	240.1	240.1	9.3	235.6	235.6	22.7	22.7	22.7	22.7		22.7
Effective Green, g (s)	13.8	240.1	240.1	9.3	235.6	235.6	22.7	22.7	22.7	22.7		22.7
Actuated g/C Ratio	0.05	0.82	0.82	0.03	0.80	0.80	0.08	0.08	0.08	0.08		0.08
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	83	4165	1291	56	4087	1267	109	144	122	104		122
v/s Ratio Prot	c0.03	c0.74		0.02	0.16			0.01				
v/s Ratio Perm			0.01			0.06	0.02		0.04	c0.06		0.00
v/c Ratio	0.72	0.90	0.02	0.71	0.20	0.08	0.28	0.07	0.55	0.77		0.01
Uniform Delay, d1	137.8	18.3	4.9	140.6	6.7	6.0	127.4	125.4	130.3	132.6		124.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	22.9	3.1	0.0	30.0	0.0	0.0	1.4	0.2	5.0	28.3		0.0
Delay (s)	160.7	21.4	4.9	170.6	6.8	6.1	128.8	125.6	135.2	160.9		124.9
Level of Service	F	C	A	F	A	A	F	F	F	F		F
Approach Delay (s)		23.5			13.3			133.5			153.7	
Approach LOS		C			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	293.1	Sum of lost time (s)	21.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	587	588	60	300	925	550	150
v/c Ratio	0.83	0.83	0.06	0.71	0.54	0.50	0.12
Control Delay	51.4	51.5	1.1	37.3	29.2	45.5	1.2
Queue Delay	0.4	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	52.0	1.1	37.3	29.2	45.5	1.2
Queue Length 50th (ft)	566	568	0	192	351	293	4
Queue Length 95th (ft)	672	673	10	325	437	353	0
Internal Link Dist (ft)		655			1415	1227	
Turn Bay Length (ft)	515		320	330			260
Base Capacity (vph)	739	739	981	435	1727	1111	1297
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	19	19	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.82	0.06	0.69	0.54	0.50	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1175	0	60	0	0	0	300	925	0	0	550	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0				7.0	7.5			7.5	7.0
Lane Util. Factor	0.95	0.95	1.00				1.00	0.95			0.95	1.00
Frt	1.00	1.00	0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1681	1583				1770	3539			3539	1583
Flt Permitted	0.95	0.95	1.00				0.29	1.00			1.00	1.00
Satd. Flow (perm)	1681	1681	1583				533	3539			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1175	0	60	0	0	0	300	925	0	0	550	150
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	0	0	0	40
Lane Group Flow (vph)	587	588	36	0	0	0	300	925	0	0	550	110
Turn Type	Split	NA	pt+ov	Split			pm+pt	NA		Perm	NA	pm+ov
Protected Phases	4	4	4 5	3	3		5	2			6	4
Permitted Phases							2			6		6
Actuated Green, G (s)	67.4	67.4	95.3				78.1	78.1			50.2	117.6
Effective Green, g (s)	67.4	67.4	95.3				78.1	78.1			50.2	117.6
Actuated g/C Ratio	0.42	0.42	0.60				0.49	0.49			0.31	0.73
Clearance Time (s)	7.0	7.0					7.0	7.5			7.5	7.0
Vehicle Extension (s)	5.0	5.0					4.0	4.0			4.0	5.0
Lane Grp Cap (vph)	708	708	942				421	1727			1110	1163
v/s Ratio Prot	0.35	c0.35	0.02				c0.09	0.26			0.16	0.04
v/s Ratio Perm							c0.25					0.03
v/c Ratio	0.83	0.83	0.04				0.71	0.54			0.50	0.09
Uniform Delay, d1	41.2	41.2	13.4				27.3	28.4			44.6	6.0
Progression Factor	1.00	1.00	1.00				1.03	0.93			0.93	1.79
Incremental Delay, d2	8.9	9.1	0.0				5.4	1.1			1.6	0.1
Delay (s)	50.1	50.3	13.4				33.5	27.6			43.2	10.9
Level of Service	D	D	B				C	C			D	B
Approach Delay (s)		48.4			0.0			29.0			36.2	
Approach LOS		D			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	166	169	175	10	40	2127	10	525	250
v/c Ratio	0.90	0.91	0.39	0.06	0.06	0.82	0.08	0.22	0.16
Control Delay	112.7	114.6	9.1	0.7	17.3	20.3	4.6	3.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.2	0.0
Total Delay	112.7	114.6	9.1	0.7	17.3	21.7	4.6	3.2	0.2
Queue Length 50th (ft)	183	186	0	0	22	387	0	14	0
Queue Length 95th (ft)	#331	#337	65	0	m51	1194	4	38	0
Internal Link Dist (ft)		625				1227		378	
Turn Bay Length (ft)	400		540		510		150		
Base Capacity (vph)	189	190	453	166	656	2591	126	2414	1583
Starvation Cap Reductn	0	0	0	0	0	121	0	1016	0
Spillback Cap Reductn	0	0	0	0	0	263	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.89	0.39	0.06	0.06	0.91	0.08	0.38	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	325	10	175	0	0	10	40	2125	2	10	525	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			7.0	7.0	7.0		7.0	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00			1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85			0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00			1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1690	1583			1583	1770	3539		1770	3539	1583
Flt Permitted	0.95	0.96	1.00			1.00	0.42	1.00		0.04	1.00	1.00
Satd. Flow (perm)	1681	1690	1583			1583	786	3539		72	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	325	10	175	0	0	10	40	2125	2	10	525	250
RTOR Reduction (vph)	0	0	147	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	166	169	28	0	0	0	40	2127	0	10	525	250
Turn Type	Split	NA	pm+ov	Split		pm+ov	pm+pt	NA		pm+pt	NA	Free
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2			6		Free
Actuated Green, G (s)	17.6	17.6	25.6			5.6	116.8	108.8		106.4	103.6	160.0
Effective Green, g (s)	17.6	17.6	25.6			5.6	116.8	108.8		106.4	103.6	160.0
Actuated g/C Ratio	0.11	0.11	0.16			0.03	0.73	0.68		0.67	0.65	1.00
Clearance Time (s)	7.0	7.0	7.0			7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	185	322			55	622	2406		77	2291	1583
v/s Ratio Prot	0.10	c0.10	0.00			0.00	0.00	c0.60		0.00	0.15	
v/s Ratio Perm			0.01			0.00	0.04			0.08		c0.16
v/c Ratio	0.90	0.91	0.09			0.01	0.06	0.88		0.13	0.23	0.16
Uniform Delay, d1	70.3	70.4	57.2			74.5	6.2	20.5		26.0	11.7	0.0
Progression Factor	1.00	1.00	1.00			1.00	2.99	1.03		0.54	0.26	1.00
Incremental Delay, d2	39.8	42.2	0.1			0.0	0.0	4.0		0.7	0.2	0.2
Delay (s)	110.1	112.7	57.4			74.6	18.6	25.3		14.6	3.3	0.2
Level of Service	F	F	E			E	B	C		B	A	A
Approach Delay (s)		92.9			74.6			25.1			2.5	
Approach LOS		F			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	225	3150	1675	125	195
v/c Ratio	0.67	0.84	0.67	0.15	0.67
Control Delay	64.0	14.2	27.2	3.8	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	14.2	27.2	3.8	50.1
Queue Length 50th (ft)	174	554	362	0	99
Queue Length 95th (ft)	359	834	574	36	243
Internal Link Dist (ft)		837	1008		920
Turn Bay Length (ft)	640			600	
Base Capacity (vph)	545	4787	3905	1245	446
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.66	0.43	0.10	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	3150	0	0	1675	125	70	0	125	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	8.0			8.0	8.0		7.0				
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.91				
Flt Protected	0.95	1.00			1.00	1.00		0.98				
Satd. Flow (prot)	1770	5085			5085	1583		1672				
Flt Permitted	0.95	1.00			1.00	1.00		0.98				
Satd. Flow (perm)	1770	5085			5085	1583		1672				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	3150	0	0	1675	125	70	0	125	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	62	0	60	0	0	0	0
Lane Group Flow (vph)	225	3150	0	0	1675	63	0	135	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			7				
Permitted Phases						6	7					
Actuated Green, G (s)	25.1	98.0			65.9	65.9		18.1				
Effective Green, g (s)	25.1	98.0			65.9	65.9		18.1				
Actuated g/C Ratio	0.19	0.75			0.50	0.50		0.14				
Clearance Time (s)	7.0	8.0			8.0	8.0		7.0				
Vehicle Extension (s)	4.0	3.0			3.0	3.0		4.0				
Lane Grp Cap (vph)	338	3801			2556	795		230				
v/s Ratio Prot	0.13	c0.62			0.33							
v/s Ratio Perm						0.04		0.08				
v/c Ratio	0.67	0.83			0.66	0.08		0.59				
Uniform Delay, d1	49.1	11.0			24.2	16.9		53.0				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	5.4	1.6			0.6	0.0		4.4				
Delay (s)	54.5	12.6			24.8	16.9		57.4				
Level of Service	D	B			C	B		E				
Approach Delay (s)		15.4			24.2			57.4			0.0	
Approach LOS		B			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	131.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	200	200	850	250	175	200	625
v/c Ratio	0.24	0.24	0.91	0.42	0.62	0.20	0.59
Control Delay	27.9	27.9	39.5	79.0	26.0	4.3	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	27.9	27.9	39.5	79.0	26.0	4.3	6.0
Queue Length 50th (ft)	143	143	652	84	27	7	22
Queue Length 95th (ft)	220	220	#1043	114	117	m2	6
Internal Link Dist (ft)		906		517			268
Turn Bay Length (ft)			430		60		
Base Capacity (vph)	875	875	978	696	306	1541	1588
Starvation Cap Reductn	0	0	0	0	0	0	165
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23	0.87	0.36	0.57	0.13	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	0	850	0	0	0	0	250	175	200	625	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Lane Util. Factor	0.95	0.95	1.00					0.86	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					6408	1583	3433	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					6408	1583	3433	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	0	850	0	0	0	0	250	175	200	625	0
RTOR Reduction (vph)	0	0	165	0	0	0	0	0	137	0	0	0
Lane Group Flow (vph)	200	200	685	0	0	0	0	250	38	200	625	0
Turn Type	Split	NA	Perm					NA	Perm	Split	NA	
Protected Phases	2	2						1		6 8	6 8	
Permitted Phases			2						1			
Actuated Green, G (s)	86.3	86.3	86.3					16.4	16.4	52.5	52.5	
Effective Green, g (s)	86.3	86.3	86.3					16.4	16.4	52.5	52.5	
Actuated g/C Ratio	0.49	0.49	0.49					0.09	0.09	0.30	0.30	
Clearance Time (s)	7.0	7.0	7.0					7.0	7.0			
Vehicle Extension (s)	3.0	3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)	823	823	775					596	147	1022	1054	
v/s Ratio Prot	0.12	0.12						c0.04		0.06	c0.18	
v/s Ratio Perm			c0.43						0.02			
v/c Ratio	0.24	0.24	0.88					0.42	0.26	0.20	0.59	
Uniform Delay, d1	26.0	26.0	40.5					75.4	74.3	46.1	52.7	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.09	0.08	
Incremental Delay, d2	0.2	0.2	11.7					0.7	1.3	0.1	0.6	
Delay (s)	26.2	26.2	52.1					76.1	75.5	4.0	4.7	
Level of Service	C	C	D					E	E	A	A	
Approach Delay (s)		43.8			0.0			75.8			4.6	
Approach LOS		D			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	176.2	Sum of lost time (s)	28.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	30	30	1150	90	500	1100	60
v/c Ratio	0.43	0.43	0.73	0.04	0.23	0.80	0.15
Control Delay	104.1	104.1	2.9	0.9	2.8	71.4	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	104.1	104.1	2.9	0.9	3.0	71.4	3.0
Queue Length 50th (ft)	37	37	0	1	10	367	0
Queue Length 95th (ft)	81	81	0	155	9	430	12
Internal Link Dist (ft)		774			268	733	
Turn Bay Length (ft)	460		450				220
Base Capacity (vph)	336	336	1583	2210	2279	1465	433
Starvation Cap Reductn	0	0	0	0	1117	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.09	0.73	0.04	0.43	0.75	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	0	1150	90	500	0	0	1100	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	4.0	7.0	7.0			7.0	7.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.86	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1681	1583	3433	3539			6408	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1681	1583	3433	3539			6408	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	60	0	1150	90	500	0	0	1100	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	47
Lane Group Flow (vph)	0	0	0	30	30	1150	90	500	0	0	1100	13
Turn Type				Split	NA	Free	Split	NA			NA	Perm
Protected Phases				8	8		1 2	1 2			6	
Permitted Phases						Free						6
Actuated Green, G (s)				7.5	7.5	176.2	109.7	109.7			38.0	38.0
Effective Green, g (s)				7.5	7.5	176.2	109.7	109.7			38.0	38.0
Actuated g/C Ratio				0.04	0.04	1.00	0.62	0.62			0.22	0.22
Clearance Time (s)				7.0	7.0						7.0	7.0
Vehicle Extension (s)				3.0	3.0						3.0	3.0
Lane Grp Cap (vph)				71	71	1583	2137	2203			1381	341
v/s Ratio Prot				0.02	0.02		0.03	0.14			0.17	
v/s Ratio Perm						c0.73						0.01
v/c Ratio				0.42	0.42	0.73	0.04	0.23			0.80	0.04
Uniform Delay, d1				82.2	82.2	0.0	12.9	14.6			65.4	54.6
Progression Factor				1.00	1.00	1.00	0.06	0.17			1.00	1.00
Incremental Delay, d2				4.0	4.0	2.9	0.0	0.1			3.3	0.0
Delay (s)				86.3	86.3	2.9	0.8	2.5			68.7	54.7
Level of Service				F	F	A	A	A			E	D
Approach Delay (s)		0.0			7.1			2.3			68.0	
Approach LOS		A			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	176.2	Sum of lost time (s)	28.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

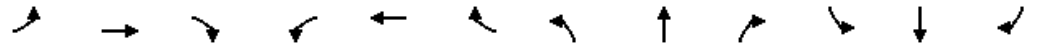
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	725	1025	575	60	1225	225	1075	450	80	80	250	475
v/c Ratio	1.47	0.77	0.67	0.70	1.23	0.38	1.49	0.37	0.12	0.48	0.37	0.98
Control Delay	266.6	48.9	15.0	133.0	147.9	6.6	267.9	34.9	3.4	86.0	51.4	61.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	266.6	48.9	15.0	133.0	147.9	6.6	267.9	34.9	3.4	86.0	51.4	61.6
Queue Length 50th (ft)	~547	502	136	0	~814	40	~785	165	0	44	90	138
Queue Length 95th (ft)	#678	591	283	m#135	#961	55	#957	m166	m19	75	123	#356
Internal Link Dist (ft)		1623			621			1129			657	
Turn Bay Length (ft)	560			330			415		305	365		275
Base Capacity (vph)	493	1327	854	88	995	600	722	1238	667	171	707	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.47	0.77	0.67	0.68	1.23	0.38	1.49	0.36	0.12	0.47	0.35	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	725	1025	575	60	1225	225	1075	450	80	80	250	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3416	3522	1575	1770	3539	1577	3614	3539	1577	3433	3539	1577
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3416	3522	1575	1770	3539	1577	3614	3539	1577	3433	3539	1577
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	725	1025	575	60	1225	225	1075	450	80	80	250	475
RTOR Reduction (vph)	0	0	260	0	0	157	0	0	52	0	0	182
Lane Group Flow (vph)	725	1025	315	60	1225	68	1075	450	28	80	250	293
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	1	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	23.1	60.3	60.3	7.8	45.0	45.0	32.0	55.2	55.2	7.7	30.9	30.9
Effective Green, g (s)	23.1	60.3	60.3	7.8	45.0	45.0	32.0	55.2	55.2	7.7	30.9	30.9
Actuated g/C Ratio	0.14	0.38	0.38	0.05	0.28	0.28	0.20	0.35	0.35	0.05	0.19	0.19
Clearance Time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	4.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	493	1327	593	86	995	443	722	1220	544	165	683	304
v/s Ratio Prot	c0.21	0.29		0.03	c0.35		c0.30	0.13		0.02	0.07	
v/s Ratio Perm			0.20			0.04			0.02			c0.19
v/c Ratio	1.47	0.77	0.53	0.70	1.23	0.15	1.49	0.37	0.05	0.48	0.37	0.97
Uniform Delay, d1	68.5	43.8	38.8	74.9	57.5	43.2	64.0	39.3	34.9	74.2	56.0	64.0
Progression Factor	1.00	1.00	1.00	1.37	0.72	0.88	1.04	0.87	1.00	1.03	0.89	0.78
Incremental Delay, d2	222.6	4.4	3.4	18.8	111.6	0.6	224.7	0.1	0.0	2.2	0.3	41.2
Delay (s)	291.1	48.2	42.2	121.3	152.8	38.5	291.3	34.4	35.0	78.5	50.3	90.9
Level of Service	F	D	D	F	F	D	F	C	C	E	D	F
Approach Delay (s)		122.5			134.5			206.5			77.0	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	141.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	117.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	SER	NWL	NWR	NET	NER	SWL	SWT
Lane Group Flow (vph)	625	225	225	6	14	400	108	97	40
v/c Ratio	0.79	0.20	0.20	0.06	0.04	0.26	0.14	0.20	0.02
Control Delay	55.0	0.4	0.4	58.0	0.2	2.9	0.4	20.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0
Total Delay	55.0	0.4	0.4	58.0	0.2	3.1	0.7	20.5	19.9
Queue Length 50th (ft)	252	0	0	5	0	7	0	39	7
Queue Length 95th (ft)	320	0	0	19	0	8	1	89	22
Internal Link Dist (ft)		377				190			349
Turn Bay Length (ft)	200		200					400	
Base Capacity (vph)	845	1117	1117	381	572	1561	782	490	1863
Starvation Cap Reductn	0	0	0	0	0	445	354	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.20	0.20	0.02	0.02	0.36	0.25	0.20	0.02

Intersection Summary

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	625	0	450	6	0	14	0	400	108	97	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	0.95	1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.85	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1504	1504	1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.42	1.00	
Satd. Flow (perm)	3433	1504	1504	1770		1583		3539	1583	785	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	625	0	450	6	0	14	0	400	108	97	40	0
RTOR Reduction (vph)	0	173	173	0	0	12	0	0	61	0	0	0
Lane Group Flow (vph)	625	52	52	6	0	2	0	400	47	97	40	0
Turn Type	Split	NA	Prot	Prot		custom		NA	Perm	pm+pt	NA	
Protected Phases	4	4	4	3		3 5		6		5	2	
Permitted Phases									6	2		
Actuated Green, G (s)	29.9	29.9	29.9	6.4		16.1		56.0	56.0	62.9	62.9	
Effective Green, g (s)	29.9	29.9	29.9	6.4		16.1		56.0	56.0	62.9	62.9	
Actuated g/C Ratio	0.23	0.23	0.23	0.05		0.12		0.43	0.43	0.48	0.48	
Clearance Time (s)	7.0	7.0	7.0	7.0				7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	789	345	345	87		196		1524	681	453	1712	
v/s Ratio Prot	c0.18	0.03	0.03	c0.00		0.00		c0.11		c0.02	0.01	
v/s Ratio Perm									0.03	0.09		
v/c Ratio	0.79	0.15	0.15	0.07		0.01		0.26	0.07	0.21	0.02	
Uniform Delay, d1	47.1	39.9	39.9	59.0		50.0		23.7	21.7	18.7	17.5	
Progression Factor	1.00	1.00	1.00	1.00		1.00		0.10	0.01	1.00	1.00	
Incremental Delay, d2	5.5	0.2	0.2	0.3		0.0		0.4	0.2	0.2	0.0	
Delay (s)	52.6	40.1	40.1	59.3		50.0		2.8	0.4	19.0	17.5	
Level of Service	D	D	D	E		D		A	A	B	B	
Approach Delay (s)		47.4			52.8			2.3			18.6	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NET	SWT
Lane Group Flow (vph)	290	775	40
v/c Ratio	0.72	0.41	0.01
Control Delay	32.3	10.5	8.4
Queue Delay	0.0	0.0	0.0
Total Delay	32.3	10.5	8.4
Queue Length 50th (ft)	104	89	2
Queue Length 95th (ft)	167	143	7
Internal Link Dist (ft)	1324	350	136
Turn Bay Length (ft)			
Base Capacity (vph)	503	1900	2730
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.58	0.41	0.01

Intersection Summary

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	40	250	775	0	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.91
Frt	0.88		1.00			1.00
Flt Protected	0.99		1.00			1.00
Satd. Flow (prot)	1635		3539			5085
Flt Permitted	0.99		1.00			1.00
Satd. Flow (perm)	1635		3539			5085
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	250	775	0	0	40
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	290	0	775	0	0	40
Turn Type	NA		NA			NA
Protected Phases	4		6			2
Permitted Phases						
Actuated Green, G (s)	16.1		34.9			34.9
Effective Green, g (s)	16.1		34.9			34.9
Actuated g/C Ratio	0.25		0.54			0.54
Clearance Time (s)	7.0		7.0			7.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	404		1900			2730
v/s Ratio Prot	c0.18		c0.22			0.01
v/s Ratio Perm						
v/c Ratio	0.72		0.41			0.01
Uniform Delay, d1	22.4		8.9			7.0
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	6.0		0.7			0.0
Delay (s)	28.4		9.6			7.0
Level of Service	C		A			A
Approach Delay (s)	28.4		9.6			7.0
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	70	175	1125	400	250
v/c Ratio	0.19	0.62	0.42	0.22	0.22
Control Delay	1.1	40.8	4.0	12.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	40.8	4.0	12.5	6.2
Queue Length 50th (ft)	0	82	78	52	25
Queue Length 95th (ft)	1	139	107	124	102
Internal Link Dist (ft)	455		930	1767	
Turn Bay Length (ft)		300			300
Base Capacity (vph)	382	354	2688	1814	1141
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.49	0.42	0.22	0.22

Intersection Summary

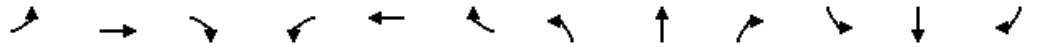
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	50	20	175	1125	400	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0	6.5	6.5	7.0
Lane Util. Factor	0.97		1.00	0.95	0.95	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3340		1770	3539	3539	1583
Flt Permitted	0.97		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3340		1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	20	175	1125	400	250
RTOR Reduction (vph)	65	0	0	0	0	104
Lane Group Flow (vph)	5	0	175	1125	400	146
Turn Type	NA		Prot	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases						6
Actuated Green, G (s)	5.7		12.7	60.8	41.1	46.8
Effective Green, g (s)	5.7		12.7	60.8	41.1	46.8
Actuated g/C Ratio	0.07		0.16	0.76	0.51	0.58
Clearance Time (s)	7.0		7.0	6.5	6.5	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	237		280	2689	1818	926
v/s Ratio Prot	0.00		c0.10	c0.32	0.11	c0.01
v/s Ratio Perm						0.08
v/c Ratio	0.02		0.62	0.42	0.22	0.16
Uniform Delay, d1	34.6		31.4	3.4	10.7	7.6
Progression Factor	1.00		1.00	1.00	1.09	9.05
Incremental Delay, d2	0.0		4.3	0.5	0.3	0.1
Delay (s)	34.6		35.7	3.9	11.9	68.8
Level of Service	C		D	A	B	E
Approach Delay (s)	34.6			8.1	33.8	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	175	575	200	725	1650	250	1700	550
v/c Ratio	0.83	0.38	0.82	0.59	0.76	0.87	0.75	0.35
Control Delay	119.3	0.7	115.3	15.8	53.6	112.3	30.0	0.6
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	119.3	0.7	115.3	16.1	53.6	112.3	30.0	0.6
Queue Length 50th (ft)	238	0	257	122	741	340	896	0
Queue Length 95th (ft)	#353	0	364	182	821	451	985	0
Internal Link Dist (ft)	610				1235		338	
Turn Bay Length (ft)		270		365		390		
Base Capacity (vph)	231	1530	268	1227	2158	328	2261	1584
Starvation Cap Reductn	0	0	0	111	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.38	0.75	0.65	0.76	0.76	0.75	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	175	575	200	0	725	0	1450	200	250	1700	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			3%			1%			-4%	
Total Lost time (s)		7.0	4.0	7.0		7.0		7.0		7.0	7.0	4.0
Lane Util. Factor		1.00	1.00	1.00		0.88		0.91		1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85		0.98		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)		1800	1530	1710		2692		4872		1770	3541	1584
Flt Permitted		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)		1800	1530	1710		2692		4872		1770	3541	1584
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	175	575	200	0	725	0	1450	200	250	1700	550
RTOR Reduction (vph)	0	0	0	0	0	316	0	8	0	0	0	0
Lane Group Flow (vph)	0	175	575	200	0	409	0	1642	0	250	1700	550
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Free	Prot		custom		NA		Prot	NA	Free
Protected Phases		3		4		4 1		2		1	6	
Permitted Phases			Free									Free
Actuated Green, G (s)		24.7	210.0	30.2		71.6		92.7		34.4	134.1	210.0
Effective Green, g (s)		24.7	210.0	30.2		71.6		92.7		34.4	134.1	210.0
Actuated g/C Ratio		0.12	1.00	0.14		0.34		0.44		0.16	0.64	1.00
Clearance Time (s)		7.0		7.0				7.0		7.0	7.0	
Vehicle Extension (s)		4.0		4.0				5.0		4.0	5.0	
Lane Grp Cap (vph)		211	1530	245		917		2150		289	2261	1584
v/s Ratio Prot		c0.10		c0.12		0.15		0.34		c0.14	c0.48	
v/s Ratio Perm			0.38									0.35
v/c Ratio		0.83	0.38	0.82		0.45		0.76		0.87	0.75	0.35
Uniform Delay, d1		90.6	0.0	87.2		53.8		49.4		85.5	26.4	0.0
Progression Factor		1.00	1.00	1.04		0.81		1.00		1.00	1.00	1.00
Incremental Delay, d2		23.7	0.7	19.4		0.5		2.6		23.2	2.4	0.6
Delay (s)		114.3	0.7	110.2		44.3		52.1		108.8	28.7	0.6
Level of Service		F	A	F		D		D		F	C	A
Approach Delay (s)		27.2			58.5			52.1			30.6	
Approach LOS		C			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	210.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	10	20	20	40	70	1175	20	100	2600	275
v/c Ratio	0.98	0.07	0.09	0.44	0.28	0.79	0.46	0.02	0.30	0.95	0.29
Control Delay	156.7	82.4	0.8	120.5	4.8	84.2	11.8	0.1	7.0	31.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.7	0.0
Total Delay	156.7	82.4	0.8	120.5	4.8	84.2	11.8	0.1	7.0	50.5	4.8
Queue Length 50th (ft)	159	12	0	25	0	39	313	0	26	1452	46
Queue Length 95th (ft)	#312	36	0	#62	0	#145	356	0	41	1583	87
Internal Link Dist (ft)		602		1004			953			1235	
Turn Bay Length (ft)	80		80			360		390	380		
Base Capacity (vph)	128	142	216	45	143	89	2542	1161	330	2749	941
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	244	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.07	0.09	0.44	0.28	0.79	0.46	0.02	0.30	1.04	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	10	20	10	10	40	70	1175	20	100	2600	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1740	1516	1752	3505	1562	1752	3774	1237
Flt Permitted	0.95	1.00	1.00		0.98	1.00	0.03	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1740	1516	54	3505	1562	375	3774	1237
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	10	20	10	10	40	70	1175	20	100	2600	275
RTOR Reduction (vph)	0	0	18	0	0	39	0	0	6	0	0	42
Lane Group Flow (vph)	125	10	2	0	20	1	70	1175	14	100	2600	233
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	30%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	15.0	15.0	15.0		4.0	4.0	141.9	136.4	136.4	143.1	137.0	137.0
Effective Green, g (s)	15.0	15.0	15.0		4.0	4.0	141.9	136.4	136.4	143.1	137.0	137.0
Actuated g/C Ratio	0.08	0.08	0.08		0.02	0.02	0.75	0.72	0.72	0.75	0.72	0.72
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	128	142	119		36	31	89	2516	1121	326	2721	891
v/s Ratio Prot	c0.08	0.01			c0.01		c0.02	0.34		0.01	c0.69	
v/s Ratio Perm			0.00			0.00	0.56		0.01	0.22		0.19
v/c Ratio	0.98	0.07	0.01		0.56	0.03	0.79	0.47	0.01	0.31	0.96	0.26
Uniform Delay, d1	87.3	81.0	80.7		92.1	91.1	62.5	11.4	7.6	7.7	23.8	9.1
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	73.3	0.7	0.2		17.3	0.4	35.5	0.6	0.0	0.5	9.6	0.7
Delay (s)	160.6	81.8	80.8		109.4	91.5	97.9	12.0	7.7	8.2	33.4	9.8
Level of Service	F	F	F		F	F	F	B	A	A	C	A
Approach Delay (s)		145.2			97.4			16.7			30.3	
Approach LOS		F			F			B			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	50	1225	90	200	2350
v/c Ratio	0.27	0.43	0.44	0.07	0.52	0.74
Control Delay	104.7	27.3	6.2	0.8	6.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.2
Total Delay	104.7	27.3	6.2	0.8	6.5	7.0
Queue Length 50th (ft)	27	0	236	0	29	474
Queue Length 95th (ft)	62	45	298	14	46	587
Internal Link Dist (ft)	56		3201			953
Turn Bay Length (ft)				350	405	
Base Capacity (vph)	85	128	2805	1271	455	3158
Starvation Cap Reductn	0	0	0	0	0	536
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.39	0.44	0.07	0.44	0.90

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	50	1225	90	200	2350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		4%			-1%
Total Lost time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1388	1242	3402	1522	1744	3489
Flt Permitted	0.95	1.00	1.00	1.00	0.20	1.00
Satd. Flow (perm)	1388	1242	3402	1522	369	3489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	50	1225	90	200	2350
RTOR Reduction (vph)	0	48	0	16	0	0
Lane Group Flow (vph)	20	2	1225	74	200	2350
Heavy Vehicles (%)	30%	30%	4%	4%	4%	4%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	9.1	9.1	171.8	171.8	187.4	187.4
Effective Green, g (s)	9.1	9.1	171.8	171.8	187.4	187.4
Actuated g/C Ratio	0.04	0.04	0.82	0.82	0.89	0.89
Clearance Time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Vehicle Extension (s)	5.0	5.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	60	53	2783	1245	385	3113
v/s Ratio Prot	c0.01		0.36		0.02	c0.67
v/s Ratio Perm		0.00		0.05	0.44	
v/c Ratio	0.33	0.04	0.44	0.06	0.52	0.75
Uniform Delay, d1	97.5	96.3	5.4	3.7	3.5	3.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	0.7	0.5	0.1	1.2	1.8
Delay (s)	104.3	96.9	5.9	3.7	4.7	5.5
Level of Service	F	F	A	A	A	A
Approach Delay (s)	99.0		5.8			5.4
Approach LOS	F		A			A

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	210.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	500	495	750	10	130	30	300	30	600
v/c Ratio	2.14	0.52	1.08	0.01	0.67	0.09	0.72	0.07	1.49
Control Delay	547.4	21.3	103.4	0.0	80.6	0.6	53.9	36.8	263.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	547.4	21.3	103.4	0.0	80.6	0.6	53.9	36.8	263.7
Queue Length 50th (ft)	~739	334	~819	0	124	0	288	26	~818
Queue Length 95th (ft)	#971	460	#1147	0	190	0	m347	m37	m#986
Internal Link Dist (ft)		3024	1297		1097			1436	
Turn Bay Length (ft)	220						380		
Base Capacity (vph)	234	951	692	703	333	434	419	441	404
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.14	0.52	1.08	0.01	0.39	0.07	0.72	0.07	1.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	500	475	20	0	750	10	60	70	30	300	30	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050
Grade (%)		3%			-2%			4%			-3%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1743	1824			1881	1599		1784	1552	1796	1891	1734
Flt Permitted	0.06	1.00			1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	118	1824			1881	1599		1784	1552	1796	1891	1734
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	500	475	20	0	750	10	60	70	30	300	30	600
RTOR Reduction (vph)	0	1	0	0	0	6	0	0	27	0	0	0
Lane Group Flow (vph)	500	494	0	0	750	4	0	130	3	300	30	600
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2			3			4
Actuated Green, G (s)	78.2	78.2			55.2	55.2		16.3	16.3	35.0	35.0	35.0
Effective Green, g (s)	78.2	78.2			55.2	55.2		16.3	16.3	35.0	35.0	35.0
Actuated g/C Ratio	0.52	0.52			0.37	0.37		0.11	0.11	0.23	0.23	0.23
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.5	4.0			4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	234	950			692	588		193	168	419	441	404
v/s Ratio Prot	c0.23	0.27			0.40			c0.07		0.17	0.02	
v/s Ratio Perm	c0.88					0.00			0.00			c0.35
v/c Ratio	2.14	0.52			1.08	0.01		0.67	0.02	0.72	0.07	1.49
Uniform Delay, d1	49.9	23.6			47.4	30.0		64.3	59.7	52.9	44.8	57.5
Progression Factor	0.72	0.79			1.00	1.00		1.00	1.00	0.87	0.81	0.89
Incremental Delay, d2	523.9	1.8			59.2	0.0		8.9	0.0	4.0	0.0	227.3
Delay (s)	559.6	20.4			106.6	30.0		73.2	59.8	50.2	36.3	278.5
Level of Service	F	C			F	C		E	E	D	D	F
Approach Delay (s)		291.4			105.6			70.7			197.0	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	198.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	825	350	425	625	450	425
v/c Ratio	0.55	0.40	0.78	0.28	0.86	0.30
Control Delay	28.5	12.3	70.2	19.7	65.1	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	12.3	70.2	19.7	65.1	18.2
Queue Length 50th (ft)	313	118	224	186	415	113
Queue Length 95th (ft)	412	205	m181	m159	503	123
Internal Link Dist (ft)	1397			2206	1099	
Turn Bay Length (ft)		400	500		400	
Base Capacity (vph)	1497	871	620	2203	660	1455
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.40	0.69	0.28	0.68	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	825	350	425	625	450	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	825	350	425	625	450	425
RTOR Reduction (vph)	0	202	0	0	0	32
Lane Group Flow (vph)	825	148	425	625	450	393
Turn Type	NA	Perm	Prot	NA	NA	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	63.5	63.5	23.9	93.4	44.6	74.5
Effective Green, g (s)	63.5	63.5	23.9	93.4	44.6	74.5
Actuated g/C Ratio	0.42	0.42	0.16	0.62	0.30	0.50
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1498	670	546	2203	526	1384
v/s Ratio Prot	c0.23		c0.12	0.18	c0.25	0.14
v/s Ratio Perm		0.09				
v/c Ratio	0.55	0.22	0.78	0.28	0.86	0.28
Uniform Delay, d1	32.5	27.5	60.5	13.0	49.7	22.1
Progression Factor	0.78	3.30	1.15	1.40	1.00	1.00
Incremental Delay, d2	1.3	0.7	0.7	0.0	12.9	0.1
Delay (s)	26.7	91.5	70.2	18.2	62.5	22.2
Level of Service	C	F	E	B	E	C
Approach Delay (s)	46.0			39.2	43.0	
Approach LOS	D			D	D	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	20	1300	200	80	1075	40	10
v/c Ratio	0.05	0.48	0.16	0.23	0.37	0.35	0.06
Control Delay	1.5	3.6	0.2	1.7	5.7	74.2	0.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	1.5	3.9	0.2	1.7	5.7	74.2	0.6
Queue Length 50th (ft)	1	49	0	8	251	38	0
Queue Length 95th (ft)	m3	m58	m0	m6	m210	78	0
Internal Link Dist (ft)		603			592	815	
Turn Bay Length (ft)	180		290	400			680
Base Capacity (vph)	451	2699	1253	392	2925	188	236
Starvation Cap Reductn	0	628	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.63	0.16	0.20	0.37	0.21	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1300	200	80	1075	0	40	0	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00			
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00			
Satd. Flow (prot)	1752	3504	1567	1787	3575			1770	1583			
Flt Permitted	0.25	1.00	1.00	0.18	1.00			0.95	1.00			
Satd. Flow (perm)	467	3504	1567	336	3575			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1300	200	80	1075	0	40	0	10	0	0	0
RTOR Reduction (vph)	0	0	48	0	0	0	0	0	9	0	0	0
Lane Group Flow (vph)	20	1300	152	80	1075	0	0	40	1	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4		4	8		
Actuated Green, G (s)	117.8	114.2	114.2	124.0	117.3			8.6	8.6			
Effective Green, g (s)	117.8	114.2	114.2	124.0	117.3			8.6	8.6			
Actuated g/C Ratio	0.79	0.76	0.76	0.83	0.78			0.06	0.06			
Clearance Time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0			3.0	3.0			
Lane Grp Cap (vph)	397	2667	1193	342	2795			101	90			
v/s Ratio Prot	0.00	c0.37		c0.01	c0.30							
v/s Ratio Perm	0.04		0.10	0.18				0.02	0.00			
v/c Ratio	0.05	0.49	0.13	0.23	0.38			0.40	0.01			
Uniform Delay, d1	3.6	6.8	4.7	3.8	5.1			68.2	66.7			
Progression Factor	0.54	0.44	0.02	0.66	1.10			1.00	1.00			
Incremental Delay, d2	0.0	0.4	0.2	0.0	0.0			2.5	0.0			
Delay (s)	2.0	3.5	0.3	2.5	5.6			70.7	66.7			
Level of Service	A	A	A	A	A			E	E			
Approach Delay (s)		3.0			5.4			69.9			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	350	900	200	175	300	275	100	10	400	375	175
v/c Ratio	0.73	0.48	0.21	0.57	0.16	0.24	0.43	0.02	1.38	0.46	0.23
Control Delay	71.6	22.8	2.9	76.0	23.7	1.1	72.8	0.1	228.5	51.3	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.6	22.8	2.9	76.0	23.7	1.1	72.8	0.1	228.5	51.3	1.7
Queue Length 50th (ft)	172	278	0	92	70	6	50	0	~427	143	2
Queue Length 95th (ft)	220	365	41	133	100	19	82	0	#623	174	14
Internal Link Dist (ft)		1562			603		1172			469	
Turn Bay Length (ft)	440		360	365		410		360	300		290
Base Capacity (vph)	497	1881	938	307	1889	1162	1074	616	290	1299	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.48	0.21	0.57	0.16	0.24	0.09	0.02	1.38	0.29	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

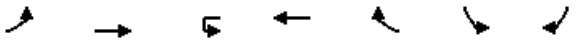
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	900	200	175	300	275	0	100	10	400	375	175
Ideal Flow (vphpl)	2000	1900	1900	1900	2000	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-5%			-3%			-4%	
Total Lost time (s)	7.0	7.5	7.0	7.0	7.5	7.0		7.5	7.0	7.0	7.5	7.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	3468	1552	3519	3819	1623		3664	1639	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	3541	3468	1552	3519	3819	1623		3664	1639	757	3610	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	900	200	175	300	275	0	100	10	400	375	175
RTOR Reduction (vph)	0	0	91	0	0	108	0	0	8	0	0	112
Lane Group Flow (vph)	350	900	109	175	300	167	0	100	2	400	375	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	20.2	81.4	81.4	13.0	74.2	91.2		9.6	22.6	33.6	33.6	53.8
Effective Green, g (s)	20.2	81.4	81.4	13.0	74.2	91.2		9.6	22.6	33.6	33.6	53.8
Actuated g/C Ratio	0.13	0.54	0.54	0.09	0.49	0.61		0.06	0.15	0.22	0.22	0.36
Clearance Time (s)	7.0	7.5	7.0	7.0	7.5	7.0		7.5	7.0	7.0	7.5	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	476	1881	842	304	1889	986		234	246	288	808	579
v/s Ratio Prot	c0.10	c0.26		0.05	0.08	0.02		0.03	0.00	c0.16	0.10	0.01
v/s Ratio Perm			0.07			0.08			0.00	c0.15		0.02
v/c Ratio	0.74	0.48	0.13	0.58	0.16	0.17		0.43	0.01	1.39	0.46	0.11
Uniform Delay, d1	62.3	21.2	16.9	65.8	20.8	12.8		67.6	54.2	55.8	50.4	32.1
Progression Factor	1.00	1.00	1.00	1.05	1.08	0.48		1.00	1.00	0.96	0.98	0.32
Incremental Delay, d2	5.8	0.9	0.1	2.5	0.2	0.1		1.3	0.0	193.4	0.4	0.1
Delay (s)	68.2	22.1	16.9	71.7	22.7	6.2		68.8	54.2	246.7	50.0	10.4
Level of Service	E	C	B	E	C	A		E	D	F	D	B
Approach Delay (s)		32.5			28.1			67.5			125.5	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	59.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	70	1075	430	210
v/c Ratio	0.14	0.55	0.34	0.51
Control Delay	6.9	9.3	15.0	20.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.9	9.3	15.0	20.2
Queue Length 50th (ft)	9	103	54	46
Queue Length 95th (ft)	28	180	102	103
Internal Link Dist (ft)		2661	1814	972
Turn Bay Length (ft)	275			
Base Capacity (vph)	590	3480	3424	1525
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.31	0.13	0.14

Intersection Summary



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	70	1075	0	350	80	200	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%		-1%		-6%	
Total Lost time (s)	7.0	6.5		6.5		7.0	
Lane Util. Factor	1.00	0.95		0.95		1.00	
Frt	1.00	1.00		0.97		0.99	
Flt Protected	0.95	1.00		1.00		0.95	
Satd. Flow (prot)	1744	3480		3424		1856	
Flt Permitted	0.37	1.00		1.00		0.95	
Satd. Flow (perm)	686	3480		3424		1856	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	1075	0	350	80	200	10
RTOR Reduction (vph)	0	0	0	16	0	51	0
Lane Group Flow (vph)	70	1075	0	414	0	159	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	0%	0%
Bus Blockages (#/hr)	0	1	0	0	0	0	0
Turn Type	pm+pt	NA	Prot	NA		NA	
Protected Phases	5	2	1	6		3	
Permitted Phases	2						
Actuated Green, G (s)	33.2	33.2		20.5		10.8	
Effective Green, g (s)	33.2	33.2		20.5		10.8	
Actuated g/C Ratio	0.58	0.58		0.36		0.19	
Clearance Time (s)	7.0	6.5		6.5		7.0	
Vehicle Extension (s)	2.5	3.0		3.0		3.0	
Lane Grp Cap (vph)	500	2009		1220		348	
v/s Ratio Prot	0.01	c0.31		0.12		c0.09	
v/s Ratio Perm	0.07						
v/c Ratio	0.14	0.54		0.34		0.46	
Uniform Delay, d1	5.8	7.4		13.5		20.7	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.1	0.3		0.2		1.0	
Delay (s)	5.9	7.7		13.7		21.7	
Level of Service	A	A		B		C	
Approach Delay (s)		7.6		13.7		21.7	
Approach LOS		A		B		C	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	20.5
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1150	250	70	275	112	113	175
v/c Ratio	0.53	0.31	0.19	0.11	0.49	0.50	0.48
Control Delay	20.2	3.3	24.2	12.9	42.9	43.1	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	3.3	24.2	12.9	42.9	43.1	10.1
Queue Length 50th (ft)	172	0	32	38	63	64	0
Queue Length 95th (ft)	214	42	66	90	111	112	54
Internal Link Dist (ft)	2158			451		781	
Turn Bay Length (ft)		260	190		525		500
Base Capacity (vph)	2153	813	369	2547	331	331	452
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.31	0.19	0.11	0.34	0.34	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1150	250	70	275	0	0	0	0	225	0	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			3%	
Total Lost time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5034	1567	1787	3575					1656	1656	1560
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5034	1567	1787	3575					1656	1656	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1150	250	70	275	0	0	0	0	225	0	175
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	0	151
Lane Group Flow (vph)	0	1150	107	70	275	0	0	0	0	112	113	24
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		38.5	38.5	18.6	64.1					12.4	12.4	12.4
Effective Green, g (s)		38.5	38.5	18.6	64.1					12.4	12.4	12.4
Actuated g/C Ratio		0.43	0.43	0.21	0.71					0.14	0.14	0.14
Clearance Time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Vehicle Extension (s)		5.0	5.0	3.5	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2153	670	369	2546					228	228	214
v/s Ratio Prot		c0.23		c0.04	0.08					0.07	c0.07	
v/s Ratio Perm			0.07									0.02
v/c Ratio		0.53	0.16	0.19	0.11					0.49	0.50	0.11
Uniform Delay, d1		19.1	15.8	29.5	4.0					35.9	35.9	34.0
Progression Factor		1.00	1.00	0.74	2.92					1.00	1.00	1.00
Incremental Delay, d2		1.0	0.5	1.1	0.1					1.7	1.7	0.2
Delay (s)		20.1	16.3	22.8	11.9					37.5	37.6	34.2
Level of Service		C	B	C	B					D	D	C
Approach Delay (s)		19.4			14.1			0.0			36.1	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	475	925	300	250	10	20
v/c Ratio	0.59	0.31	0.16	0.26	0.08	0.17
Control Delay	34.2	0.3	13.9	3.1	39.0	41.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	0.3	13.9	3.1	39.0	41.5
Queue Length 50th (ft)	57	1	50	0	5	11
Queue Length 95th (ft)	55	1	86	44	21	33
Internal Link Dist (ft)		451	1741		948	
Turn Bay Length (ft)	184			280		215
Base Capacity (vph)	800	3010	1848	947	700	626
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.31	0.16	0.26	0.01	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	475	925	0	0	300	250	10	0	20	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			0%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3399	3504			3575	1599		1752	1567			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3399	3504			3575	1599		1752	1567			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	475	925	0	0	300	250	10	0	20	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	129	0	0	0	0	0	0
Lane Group Flow (vph)	475	925	0	0	300	121	0	10	20	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	5	2			6		4	4	4			
Permitted Phases						6						
Actuated Green, G (s)	21.2	71.9			43.7	43.7		4.6	4.6			
Effective Green, g (s)	21.2	71.9			43.7	43.7		4.6	4.6			
Actuated g/C Ratio	0.24	0.80			0.49	0.49		0.05	0.05			
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Vehicle Extension (s)	4.0	5.0			5.0	5.0		3.0	3.0			
Lane Grp Cap (vph)	800	2799			1735	776		89	80			
v/s Ratio Prot	c0.14	c0.26			0.08			0.01	c0.01			
v/s Ratio Perm						0.08						
v/c Ratio	0.59	0.33			0.17	0.16		0.11	0.25			
Uniform Delay, d1	30.6	2.5			13.0	12.9		40.8	41.0			
Progression Factor	1.04	0.04			1.00	1.00		1.00	1.00			
Incremental Delay, d2	1.2	0.3			0.2	0.4		0.6	1.6			
Delay (s)	32.9	0.4			13.2	13.3		41.3	42.7			
Level of Service	C	A			B	B		D	D			
Approach Delay (s)		11.4			13.3			42.2			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

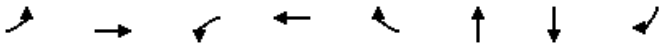
c Critical Lane Group

Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	27	89	89	10	700	375	1500	675	30
v/c Ratio	0.29	0.36	0.54	0.09	0.17	0.69	0.67	0.85	0.24	0.02
Control Delay	85.8	130.6	21.5	3.2	129.1	77.8	50.4	51.6	5.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.8	130.6	21.5	3.2	129.1	77.8	50.4	51.6	5.8	0.0
Queue Length 50th (ft)	17	48	0	0	17	574	361	1049	138	0
Queue Length 95th (ft)	56	96	50	30	46	666	513	1192	172	0
Internal Link Dist (ft)	1005		682			1789			2364	
Turn Bay Length (ft)		310			390		390	470		495
Base Capacity (vph)	68	116	197	1148	58	1229	646	2269	3079	1386
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.23	0.45	0.08	0.17	0.57	0.58	0.66	0.22	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	10	10	30	0	175	10	700	375	1500	675	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)		7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.93		1.00	0.86	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1740		1732	1491	1550	1752	3504	1567	3399	3504	1567
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1740		1732	1491	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	10	10	30	0	175	10	700	375	1500	675	30
RTOR Reduction (vph)	0	10	0	0	85	40	0	0	105	0	0	6
Lane Group Flow (vph)	0	10	0	27	4	49	10	700	270	1500	675	24
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)		5.2		9.9	9.9	125.5	3.6	68.1	68.1	115.6	180.1	180.1
Effective Green, g (s)		5.2		9.9	9.9	125.5	3.6	68.1	68.1	115.6	180.1	180.1
Actuated g/C Ratio		0.02		0.04	0.04	0.55	0.02	0.30	0.30	0.51	0.79	0.79
Clearance Time (s)		7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)		39		75	65	905	27	1052	470	1732	2782	1244
v/s Ratio Prot		c0.01		c0.02	0.00	0.03	0.01	c0.20		c0.44	0.19	
v/s Ratio Perm						0.00			0.17			0.02
v/c Ratio		0.26		0.36	0.06	0.05	0.37	0.67	0.57	0.87	0.24	0.02
Uniform Delay, d1		108.9		105.4	104.0	23.3	110.5	69.4	67.1	48.8	6.0	4.9
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.6		2.9	0.4	0.0	8.4	2.1	2.7	5.0	0.1	0.0
Delay (s)		112.5		108.3	104.4	23.4	118.9	71.5	69.8	53.8	6.1	4.9
Level of Service		F		F	F	C	F	E	E	D	A	A
Approach Delay (s)		112.5			69.7			71.4			38.5	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	226.8	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	125	2260	10	625	275	10	90	70
v/c Ratio	0.70	0.59	0.12	0.19	0.25	0.02	0.58	0.23
Control Delay	87.5	6.8	72.0	13.2	2.4	0.1	80.1	1.8
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	7.2	72.0	13.2	2.4	0.1	80.1	1.8
Queue Length 50th (ft)	127	70	10	79	0	0	86	0
Queue Length 95th (ft)	m159	479	31	144	45	0	142	0
Internal Link Dist (ft)		452		967		434	639	
Turn Bay Length (ft)	250		255		360			175
Base Capacity (vph)	214	3820	82	3227	1105	716	436	527
Starvation Cap Reductn	0	827	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.76	0.12	0.19	0.25	0.01	0.21	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	2250	10	10	625	275	0	0	10	90	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			0%			0%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.95	1.00
Satd. Flow (prot)	1787	5133		1770	5085	1583		1611			1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.95	1.00
Satd. Flow (perm)	1787	5133		1770	5085	1583		1611			1770	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	2250	10	10	625	275	0	0	10	90	0	70
RTOR Reduction (vph)	0	0	0	0	0	108	0	10	0	0	0	64
Lane Group Flow (vph)	125	2260	0	10	625	167	0	0	0	0	90	6
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases						2						3
Actuated Green, G (s)	15.1	103.3		2.8	91.0	91.0		2.8			13.1	13.1
Effective Green, g (s)	15.1	103.3		2.8	91.0	91.0		2.8			13.1	13.1
Actuated g/C Ratio	0.10	0.69		0.02	0.61	0.61		0.02			0.09	0.09
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0			3.0	3.0
Lane Grp Cap (vph)	179	3534		33	3084	960		30			154	138
v/s Ratio Prot	c0.07	c0.44		0.01	0.12			c0.00			c0.05	
v/s Ratio Perm						0.11						0.00
v/c Ratio	0.70	0.64		0.30	0.20	0.17		0.01			0.58	0.04
Uniform Delay, d1	65.2	13.0		72.6	13.2	13.0		72.2			65.8	62.7
Progression Factor	1.08	0.53		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	9.5	0.8		5.1	0.1	0.4		0.1			5.6	0.1
Delay (s)	80.2	7.7		77.8	13.4	13.4		72.3			71.4	62.8
Level of Service	F	A		E	B	B		E			E	E
Approach Delay (s)		11.5			14.1			72.3			67.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	975	1350	40	30	775	575	10	30	126	129	70
v/c Ratio	0.76	0.65	0.06	0.09	0.69	0.79	0.07	0.21	0.47	0.48	0.19
Control Delay	47.0	37.4	0.1	52.5	49.2	33.6	70.4	54.7	64.5	64.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	9.9	8.8	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	37.4	0.1	52.5	59.1	42.4	70.4	54.7	64.5	64.5	1.1
Queue Length 50th (ft)	435	405	0	25	265	294	10	19	123	126	0
Queue Length 95th (ft)	599	423	0	73	354	527	32	58	200	204	0
Internal Link Dist (ft)		967			196			671		824	
Turn Bay Length (ft)	500		200						430		430
Base Capacity (vph)	1353	2843	930	341	1131	724	435	442	524	532	594
Starvation Cap Reductn	0	0	0	0	328	120	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.47	0.04	0.09	0.97	0.95	0.02	0.07	0.24	0.24	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	975	1350	40	30	775	575	10	20	10	225	30	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			0%			-3%	
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3467	5136	1599	1752	5034	1567	1770	1770		1706	1730	1607
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3467	5136	1599	1752	5034	1567	1770	1770		1706	1730	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	975	1350	40	30	775	575	10	20	10	225	30	70
RTOR Reduction (vph)	0	0	24	0	0	373	0	9	0	0	0	59
Lane Group Flow (vph)	975	1350	16	30	775	202	10	21	0	126	129	11
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		8	8		3	3	
Permitted Phases			6			2						3
Actuated Green, G (s)	55.4	59.8	59.8	29.0	33.4	33.4	8.9	8.9		23.3	23.3	23.3
Effective Green, g (s)	55.4	59.8	59.8	29.0	33.4	33.4	8.9	8.9		23.3	23.3	23.3
Actuated g/C Ratio	0.37	0.40	0.40	0.19	0.22	0.22	0.06	0.06		0.16	0.16	0.16
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.5	3.0	3.0	3.0	3.0	3.0	4.0	4.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1280	2047	637	338	1120	348	105	105		264	268	249
v/s Ratio Prot	c0.28	0.26		0.02	c0.15		0.01	c0.01		0.07	c0.07	
v/s Ratio Perm			0.01			0.13						0.01
v/c Ratio	0.76	0.66	0.03	0.09	0.69	0.58	0.10	0.20		0.48	0.48	0.04
Uniform Delay, d1	41.5	36.8	27.4	49.7	53.6	52.0	66.7	67.1		57.8	57.8	53.9
Progression Factor	1.00	1.00	1.00	0.82	0.83	2.33	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.8	0.8	0.0	0.1	1.9	2.4	0.5	1.3		1.4	1.4	0.1
Delay (s)	44.3	37.6	27.4	40.9	46.2	123.8	67.3	68.4		59.2	59.2	53.9
Level of Service	D	D	C	D	D	F	E	E		E	E	D
Approach Delay (s)		40.2			78.4			68.1			58.1	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	54.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	1125	10	2325	10	500	300
v/c Ratio	0.93	0.02	0.83	0.23	0.17	0.29
Control Delay	75.9	1.4	21.8	88.8	38.4	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	1.4	21.8	88.8	38.4	22.2
Queue Length 50th (ft)	725	0	806	13	181	161
Queue Length 95th (ft)	819	3	1047	m40	206	228
Internal Link Dist (ft)	1564		126		1018	
Turn Bay Length (ft)				315		
Base Capacity (vph)	1261	601	2789	44	2911	1034
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.02	0.83	0.23	0.17	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	1125	10	0	2325	10	500	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0		7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00		0.91	1.00	0.91	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583		5085	1770	5085	1583
Flt Permitted	0.95	1.00		1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583		5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1125	10	0	2325	10	500	300
RTOR Reduction (vph)	0	6	0	0	0	0	128
Lane Group Flow (vph)	1125	4	0	2325	10	500	172
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	70.5	70.5		105.5	2.0	114.5	114.5
Effective Green, g (s)	70.5	70.5		105.5	2.0	114.5	114.5
Actuated g/C Ratio	0.35	0.35		0.53	0.01	0.57	0.57
Clearance Time (s)	7.5	7.0		7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0		4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	1210	558		2682	17	2911	906
v/s Ratio Prot	c0.33			c0.46	0.01	0.10	
v/s Ratio Perm		0.00					c0.11
v/c Ratio	0.93	0.01		0.87	0.59	0.17	0.19
Uniform Delay, d1	62.4	42.0		41.1	98.6	20.3	20.5
Progression Factor	1.00	1.00		0.50	0.80	1.85	11.65
Incremental Delay, d2	12.3	0.0		2.8	42.6	0.1	0.5
Delay (s)	74.7	42.0		23.4	121.8	37.7	239.3
Level of Service	E	D		C	F	D	F
Approach Delay (s)	74.4			23.4		113.4	
Approach LOS	E			C		F	

Intersection Summary			
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	3668	734	136	212	207	98
v/c Ratio	0.60	0.92	0.17	0.10	0.82	0.59	0.22
Control Delay	101.5	23.3	4.6	0.1	105.3	36.2	8.8
Queue Delay	0.0	45.2	0.0	0.0	0.4	0.3	0.0
Total Delay	101.5	68.5	4.6	0.1	105.7	36.5	8.8
Queue Length 50th (ft)	91	1264	30	0	289	110	0
Queue Length 95th (ft)	130	1621	41	0	381	206	51
Internal Link Dist (ft)		1701	1154			995	
Turn Bay Length (ft)	575				435		
Base Capacity (vph)	248	3971	4371	1392	378	458	461
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	719	0	0	23	41	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.13	0.17	0.10	0.60	0.50	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	125	3375	0	0	0	675	125	0	0	0	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Lane Util. Factor	0.97	0.91				0.86	1.00				0.95	0.91
Frt	1.00	1.00				1.00	0.85				1.00	0.99
Flt Protected	0.95	1.00				1.00	1.00				0.95	0.95
Satd. Flow (prot)	3433	5085				6408	1583				1681	1606
Flt Permitted	0.95	1.00				1.00	1.00				0.95	0.95
Satd. Flow (perm)	3433	5085				6408	1583				1681	1606
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	3668	0	0	0	734	136	0	0	0	408	0
RTOR Reduction (vph)	0	0	0	0	0	0	22	0	0	0	0	106
Lane Group Flow (vph)	136	3668	0	0	0	734	114	0	0	0	212	101
Turn Type	Prot	NA		custom		NA	pm+ov	Split			Split	NA
Protected Phases	1	6				2	4	3	3		4	4
Permitted Phases				5			2					
Actuated Green, G (s)	13.3	156.2				136.4	167.2				30.8	30.8
Effective Green, g (s)	13.3	156.2				136.4	167.2				30.8	30.8
Actuated g/C Ratio	0.07	0.78				0.68	0.84				0.15	0.15
Clearance Time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Vehicle Extension (s)	3.0	4.0				4.0	3.0				3.0	3.0
Lane Grp Cap (vph)	228	3971				4370	1374				258	247
v/s Ratio Prot	0.04	c0.72				0.11	0.01				c0.13	0.06
v/s Ratio Perm							0.06					
v/c Ratio	0.60	0.92				0.17	0.08				0.82	0.41
Uniform Delay, d1	90.7	17.2				11.4	2.9				81.9	76.4
Progression Factor	1.00	1.00				0.37	0.00				1.00	1.00
Incremental Delay, d2	4.2	4.8				0.1	0.0				18.6	1.1
Delay (s)	94.9	22.0				4.3	0.0				100.5	77.5
Level of Service	F	C				A	A				F	E
Approach Delay (s)		24.6				3.6			0.0			83.9
Approach LOS		C				A			A			F

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	100
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	0.95
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1504
Flt Permitted	1.00
Satd. Flow (perm)	1504
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	109
RTOR Reduction (vph)	76
Lane Group Flow (vph)	22
Turn Type	pm+ov
Protected Phases	1
Permitted Phases	4
Actuated Green, G (s)	44.1
Effective Green, g (s)	44.1
Actuated g/C Ratio	0.22
Clearance Time (s)	6.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	380
v/s Ratio Prot	0.00
v/s Ratio Perm	0.01
v/c Ratio	0.06
Uniform Delay, d1	61.5
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	61.6
Level of Service	E
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1087	3272	11	598	109	54	163	245	43	22	245
v/c Ratio	0.66	0.91	0.18	0.28	0.16	0.25	0.71	0.78	0.25	0.24	0.09
Control Delay	53.7	36.5	117.1	49.0	5.4	80.0	100.6	54.0	95.2	97.8	0.1
Queue Delay	0.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	63.4	117.1	49.0	5.4	80.0	100.6	54.0	95.2	97.8	0.1
Queue Length 50th (ft)	393	1529	14	171	0	66	211	146	28	28	0
Queue Length 95th (ft)	m440	#1784	43	217	41	112	287	248	54	66	0
Internal Link Dist (ft)		1154		740			701			434	
Turn Bay Length (ft)	800		415		350	195		195	240		300
Base Capacity (vph)	1646	3612	61	2172	667	380	400	447	171	93	2787
Starvation Cap Reductn	0	515	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	1.06	0.18	0.28	0.16	0.14	0.41	0.55	0.25	0.24	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1000	3000	10	10	550	100	50	150	225	40	20	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.94	0.91		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	5083		1770	6408	1583	1770	1863	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	5083		1770	6408	1583	1770	1863	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1087	3261	11	11	598	109	54	163	245	43	22	245
RTOR Reduction (vph)	0	0	0	0	0	71	0	0	119	0	0	0
Lane Group Flow (vph)	1087	3272	0	11	598	38	54	163	126	43	22	245
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Free
Protected Phases	1 3	3 6!		5!	2	8	7	7		8	8	
Permitted Phases						2			7			Free
Actuated Green, G (s)	70.2	136.6		2.8	62.2	70.2	24.6	24.6	24.6	8.0	8.0	200.0
Effective Green, g (s)	70.2	136.6		2.8	62.2	70.2	24.6	24.6	24.6	8.0	8.0	200.0
Actuated g/C Ratio	0.35	0.68		0.01	0.31	0.35	0.12	0.12	0.12	0.04	0.04	1.00
Clearance Time (s)				7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)				3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	1751	3471		24	1992	555	217	229	194	137	74	2787
v/s Ratio Prot	c0.22	c0.64		0.01	0.09	0.00	0.03	c0.09		c0.01	0.01	
v/s Ratio Perm						0.02			0.08			0.09
v/c Ratio	0.62	0.94		0.46	0.30	0.07	0.25	0.71	0.65	0.31	0.30	0.09
Uniform Delay, d1	53.9	28.2		97.8	52.4	43.2	79.3	84.3	83.6	93.3	93.3	0.0
Progression Factor	1.22	1.36		1.18	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	3.6		13.1	0.4	0.1	0.8	10.7	8.1	1.8	3.1	0.1
Delay (s)	65.9	42.0		128.1	51.4	43.1	80.2	94.9	91.6	95.1	96.3	0.1
Level of Service	E	D		F	D	D	F	F	F	F	F	A
Approach Delay (s)		47.9			51.4			91.5			20.1	
Approach LOS		D			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	35.0
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	462	2554	707	788	571	22
v/c Ratio	0.82	0.67	0.26	0.37	0.64	0.02
Control Delay	84.9	13.0	9.1	6.6	71.9	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.9	13.0	9.1	6.6	71.9	31.6
Queue Length 50th (ft)	275	543	140	231	221	9
Queue Length 95th (ft)	329	590	57	64	265	19
Internal Link Dist (ft)		3908	1326		784	
Turn Bay Length (ft)	600			800		550
Base Capacity (vph)	781	3796	2763	2165	970	1036
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.67	0.26	0.36	0.59	0.02

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	425	2350	650	725	525	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	0.97	0.91	0.91	0.88	0.94	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	5085	5085	2787	4990	2787
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	5085	5085	2787	4990	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	462	2554	707	788	571	22
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	462	2554	707	788	571	22
Turn Type	Prot	NA	NA	pt+ov	NA	pm+ov
Protected Phases	1	6	2	2 4	4	1
Permitted Phases						4
Actuated Green, G (s)	29.5	134.4	97.9	136.5	32.1	61.6
Effective Green, g (s)	29.5	134.4	97.9	136.5	32.1	61.6
Actuated g/C Ratio	0.16	0.75	0.54	0.76	0.18	0.34
Clearance Time (s)	7.0	6.5	6.5		7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0		3.5	3.0
Lane Grp Cap (vph)	562	3796	2765	2113	889	1062
v/s Ratio Prot	c0.13	c0.50	0.14	0.28	c0.11	0.00
v/s Ratio Perm						0.00
v/c Ratio	0.82	0.67	0.26	0.37	0.64	0.02
Uniform Delay, d1	72.7	11.6	21.7	7.3	68.6	39.2
Progression Factor	1.00	1.00	0.39	0.81	1.00	1.00
Incremental Delay, d2	9.4	1.0	0.2	0.1	1.7	0.0
Delay (s)	82.1	12.6	8.7	6.0	70.3	39.2
Level of Service	F	B	A	A	E	D
Approach Delay (s)		23.2	7.3		69.1	
Approach LOS		C	A		E	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	2364	924	109	1332	43	106	52	109	76	11
v/c Ratio	0.16	0.79	0.56	0.68	0.38	0.04	0.48	0.45	0.66	0.44	0.04
Control Delay	99.5	30.0	22.4	100.1	6.2	1.1	87.1	82.5	95.8	82.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.5	30.0	22.4	100.1	6.2	1.1	87.1	82.5	95.8	82.4	0.3
Queue Length 50th (ft)	14	864	384	132	169	0	67	58	126	86	0
Queue Length 95th (ft)	m22	1000	547	#210	272	13	103	113	193	141	0
Internal Link Dist (ft)		1326			2726			1066		653	
Turn Bay Length (ft)	345			225		500	1000				125
Base Capacity (vph)	69	2996	1641	172	3485	1116	223	116	292	307	384
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.79	0.56	0.63	0.38	0.04	0.48	0.45	0.37	0.25	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	2175	850	100	1225	40	125	10	10	100	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.88	1.00	0.91	1.00	0.91	0.91		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	2787	1770	5085	1583	3221	1595		1593	1676	1478
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	2787	1770	5085	1583	3221	1595		1593	1676	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	2364	924	109	1332	43	136	11	11	109	76	11
RTOR Reduction (vph)	0	0	0	0	0	14	0	6	0	0	0	10
Lane Group Flow (vph)	11	2364	924	109	1332	29	106	46	0	109	76	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6						3
Actuated Green, G (s)	2.9	106.0	106.0	16.3	119.4	119.4	12.5	12.5		18.7	18.7	18.7
Effective Green, g (s)	2.9	106.0	106.0	16.3	119.4	119.4	12.5	12.5		18.7	18.7	18.7
Actuated g/C Ratio	0.02	0.59	0.59	0.09	0.66	0.66	0.07	0.07		0.10	0.10	0.10
Clearance Time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	28	2994	1641	160	3373	1050	223	110		165	174	153
v/s Ratio Prot	0.01	c0.46		c0.06	0.26		c0.03	0.03		c0.07	0.05	
v/s Ratio Perm			0.33			0.02						0.00
v/c Ratio	0.39	0.79	0.56	0.68	0.39	0.03	0.48	0.42		0.66	0.44	0.01
Uniform Delay, d1	87.7	28.4	22.8	79.3	13.8	10.4	80.6	80.3		77.6	75.7	72.3
Progression Factor	1.14	0.94	0.87	1.00	0.43	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.4	1.7	1.1	11.9	0.3	0.0	2.2	3.5		10.4	2.4	0.0
Delay (s)	109.0	28.4	21.0	91.5	6.3	10.4	82.8	83.8		88.0	78.1	72.4
Level of Service	F	C	C	F	A	B	F	F		F	E	E
Approach Delay (s)		26.6			12.7			83.1			83.3	
Approach LOS		C			B			F			F	

Intersection Summary				
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.5	
Intersection Capacity Utilization	76.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	NWL	NWT
Lane Group Flow (vph)	163	1821	543	299	1168	707	245	44	65	131
v/c Ratio	0.62	0.60	0.47	0.75	0.36	0.57	0.71	0.29	0.18	0.70
Control Delay	124.9	8.0	2.8	87.4	12.8	5.2	80.0	34.4	63.9	39.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	124.9	8.0	2.8	87.4	12.8	5.4	80.0	34.4	63.9	39.6
Queue Length 50th (ft)	103	345	56	186	143	88	137	12	34	26
Queue Length 95th (ft)	m128	415	126	225	205	163	175	57	56	101
Internal Link Dist (ft)		620			1066			310		883
Turn Bay Length (ft)	410		500	410		1000	200		200	
Base Capacity (vph)	311	3048	1166	514	3250	1250	347	189	461	269
Starvation Cap Reductn	0	0	0	0	0	91	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.60	0.47	0.58	0.36	0.61	0.71	0.23	0.14	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	150	1675	500	275	1075	650	225	10	30	60	20	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1653		3433	1630	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.33	1.00		0.73	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1195	1653		2632	1630	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1821	543	299	1168	707	245	11	33	65	22	109
RTOR Reduction (vph)	0	0	221	0	0	243	0	31	0	0	103	0
Lane Group Flow (vph)	163	1821	322	299	1168	464	245	13	0	65	28	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	13.9	106.6	106.6	21.0	113.7	113.7	26.0	12.1		22.8	10.5	
Effective Green, g (s)	13.9	106.6	106.6	21.0	113.7	113.7	26.0	12.1		22.8	10.5	
Actuated g/C Ratio	0.08	0.59	0.59	0.12	0.63	0.63	0.14	0.07		0.13	0.06	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	265	3011	937	400	3212	999	345	111		388	95	
v/s Ratio Prot	0.05	c0.36		c0.09	0.23		c0.05	0.01		0.01	0.02	
v/s Ratio Perm			0.20			c0.29	c0.05			0.01		
v/c Ratio	0.62	0.60	0.34	0.75	0.36	0.46	0.71	0.12		0.17	0.30	
Uniform Delay, d1	80.5	23.3	18.8	76.9	15.9	17.3	71.1	78.9		70.0	81.2	
Progression Factor	1.48	0.32	1.35	0.99	0.79	2.01	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.6	0.6	7.0	0.3	1.4	6.7	0.5		0.2	1.8	
Delay (s)	121.5	7.9	26.0	83.5	12.8	36.2	77.9	79.4		70.2	83.0	
Level of Service	F	A	C	F	B	D	E	E		E	F	
Approach Delay (s)		19.2			30.1			78.1			78.7	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT
Lane Group Flow (vph)	11	1984	2120
v/c Ratio	0.15	0.38	0.45
Control Delay	81.6	0.2	0.7
Queue Delay	0.0	0.0	0.0
Total Delay	81.6	0.2	0.7
Queue Length 50th (ft)	13	0	17
Queue Length 95th (ft)	m22	0	5
Internal Link Dist (ft)		1066	1427
Turn Bay Length (ft)	550		
Base Capacity (vph)	99	5162	4746
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.11	0.38	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	1825	1950	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		-3%	4%		0%	
Total Lost time (s)	7.0	6.5	6.5			
Lane Util. Factor	1.00	0.91	0.91			
Frt	1.00	1.00	1.00			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1796	5162	4984			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	1796	5162	4984			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1984	2120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	11	1984	2120	0	0	0
Turn Type	Prot	NA	NA	Perm		Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	3.2	180.0	163.3			
Effective Green, g (s)	3.2	180.0	163.3			
Actuated g/C Ratio	0.02	1.00	0.91			
Clearance Time (s)	7.0	6.5	6.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	31	5162	4521			
v/s Ratio Prot	0.01	c0.38	c0.43			
v/s Ratio Perm						
v/c Ratio	0.35	0.38	0.47			
Uniform Delay, d1	87.4	0.0	1.3			
Progression Factor	0.94	1.00	0.49			
Incremental Delay, d2	5.5	0.2	0.2			
Delay (s)	87.4	0.2	0.9			
Level of Service	F	A	A			
Approach Delay (s)		0.7	0.9		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	0.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	300	300	950	275	500
v/c Ratio	0.80	0.43	0.50	0.62	0.20
Control Delay	72.1	2.0	21.2	15.0	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	2.0	21.2	15.0	8.3
Queue Length 50th (ft)	282	0	253	85	80
Queue Length 95th (ft)	363	0	420	153	128
Internal Link Dist (ft)		481	906		768
Turn Bay Length (ft)				250	
Base Capacity (vph)	456	743	1894	548	2509
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.40	0.50	0.50	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	300	0	300	0	575	375	275	500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor				1.00	1.00			0.95		1.00	0.95	
Frt				1.00	0.85			0.94		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1770	1583			3330		1770	3539	
Flt Permitted				0.95	1.00			1.00		0.21	1.00	
Satd. Flow (perm)				1770	1583			3330		399	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	300	0	300	0	575	375	275	500	0
RTOR Reduction (vph)	0	0	0	0	237	0	0	51	0	0	0	0
Lane Group Flow (vph)	0	0	0	300	63	0	0	899	0	275	500	0
Turn Type	Split			Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)				31.6	31.6			83.1		106.4	106.4	
Effective Green, g (s)				31.6	31.6			83.1		106.4	106.4	
Actuated g/C Ratio				0.21	0.21			0.55		0.71	0.71	
Clearance Time (s)				6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				372	333			1844		441	2510	
v/s Ratio Prot				c0.17	0.04			0.27		c0.07	0.14	
v/s Ratio Perm										c0.37		
v/c Ratio				0.81	0.19			0.49		0.62	0.20	
Uniform Delay, d1				56.3	48.7			20.4		11.8	7.4	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				12.0	0.3			0.9		2.7	0.2	
Delay (s)				68.3	49.0			21.4		14.6	7.6	
Level of Service				E	D			C		B	A	
Approach Delay (s)		0.0			58.6			21.4			10.0	
Approach LOS		A			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	109	1386	489	87	1527	380	332	65	353	245
v/c Ratio	0.50	0.98	0.53	0.99	0.92	0.60	0.99	0.10	0.98	0.50
Control Delay	69.7	56.0	7.8	173.7	68.1	72.1	117.4	60.1	111.7	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	56.0	7.8	173.7	68.1	72.1	117.4	60.1	111.7	13.3
Queue Length 50th (ft)	104	346	16	105	638	215	397	32	420	21
Queue Length 95th (ft)	176	#990	174	#234	704	275	#613	57	#638	110
Internal Link Dist (ft)		937			1943		2110		622	
Turn Bay Length (ft)	485		510	610		160		250		300
Base Capacity (vph)	216	1415	920	88	1655	629	336	667	362	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.98	0.53	0.99	0.92	0.60	0.99	0.10	0.98	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1275	450	80	1325	80	350	275	30	60	325	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.97	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	5042		3433	1835		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	5042		3433	1835		3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1386	489	87	1440	87	380	299	33	65	353	245
RTOR Reduction (vph)	0	0	287	0	3	0	0	0	0	0	0	180
Lane Group Flow (vph)	109	1386	202	87	1524	0	380	332	0	65	353	65
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	7		3	3		6	6	
Permitted Phases			2									6
Actuated Green, G (s)	22.0	72.0	72.0	9.0	59.0		33.0	33.0		35.0	35.0	35.0
Effective Green, g (s)	22.0	72.0	72.0	9.0	59.0		33.0	33.0		35.0	35.0	35.0
Actuated g/C Ratio	0.12	0.40	0.40	0.05	0.33		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	216	1415	633	88	1652		629	336		667	362	307
v/s Ratio Prot	0.06	c0.39		0.05	c0.30		0.11	c0.18		0.02	c0.19	
v/s Ratio Perm			0.13									0.04
v/c Ratio	0.50	0.98	0.32	0.99	0.92		0.60	0.99		0.10	0.98	0.21
Uniform Delay, d1	73.9	53.3	37.1	85.4	58.3		67.5	73.3		59.5	72.1	60.9
Progression Factor	0.83	0.70	1.83	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	18.8	1.2	91.3	10.0		1.6	45.4		0.1	40.3	0.3
Delay (s)	63.1	55.9	69.1	176.8	68.3		69.1	118.7		59.6	112.4	61.2
Level of Service	E	E	E	F	E		E	F		E	F	E
Approach Delay (s)		59.5			74.2			92.3			88.3	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	72.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	125	350	650	550	175
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	50	125	350	650	550	175
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1900	550	550			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1900	550	550			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	77	66			
cM capacity (veh/h)	50	535	1020			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	175	350	650	550	175
Volume Left	50	350	0	0	0
Volume Right	125	0	0	0	175
cSH	142	1020	1700	1700	1700
Volume to Capacity	1.24	0.34	0.38	0.32	0.10
Queue Length 95th (ft)	261	38	0	0	0
Control Delay (s)	213.4	10.4	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	213.4	3.6		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	21.6			
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	60	3750	20	40	850	125	30	10	150	80	20
v/c Ratio	0.72	0.90	0.02	0.73	0.21	0.10	0.27	0.07	0.82	0.75	0.05
Control Delay	181.1	23.8	5.9	196.1	7.5	1.1	132.7	124.7	109.4	171.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.1	23.8	5.9	196.1	7.5	1.1	132.7	124.7	109.4	171.3	0.2
Queue Length 50th (ft)	118	1739	7	79	135	0	56	19	174	157	0
Queue Length 95th (ft)	193	1994	17	#163	188	21	105	47	279	238	0
Internal Link Dist (ft)		1472			1818			850			
Turn Bay Length (ft)	520		380	380		400	55		65	270	280
Base Capacity (vph)	108	4160	1290	60	4081	1290	187	247	265	180	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.90	0.02	0.67	0.21	0.10	0.16	0.04	0.57	0.44	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	3750	20	40	850	125	30	10	150	80	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5085	1577	1770	5085	1577	1770	1863	1583	1711		1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.76	1.00	1.00	0.75		1.00
Satd. Flow (perm)	1770	5085	1577	1770	5085	1577	1410	1863	1583	1352		1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	3750	20	40	850	125	30	10	150	80	0	20
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	58	0	0	18
Lane Group Flow (vph)	60	3750	20	40	850	100	30	10	92	80	0	2
Bus Blockages (#/hr)	0	0	1	0	0	1	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm		Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4		4	8		8
Actuated Green, G (s)	13.8	240.2	240.2	9.3	235.7	235.7	23.1	23.1	23.1	23.1		23.1
Effective Green, g (s)	13.8	240.2	240.2	9.3	235.7	235.7	23.1	23.1	23.1	23.1		23.1
Actuated g/C Ratio	0.05	0.82	0.82	0.03	0.80	0.80	0.08	0.08	0.08	0.08		0.08
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	83	4160	1290	56	4082	1266	110	146	124	106		124
v/s Ratio Prot	c0.03	c0.74		0.02	0.17			0.01				
v/s Ratio Perm			0.01			0.06	0.02		0.06	c0.06		0.00
v/c Ratio	0.72	0.90	0.02	0.71	0.21	0.08	0.27	0.07	0.74	0.75		0.01
Uniform Delay, d1	138.0	18.5	4.9	140.8	6.9	6.1	127.3	125.3	132.3	132.5		124.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	22.9	3.2	0.0	30.0	0.0	0.0	1.3	0.2	21.0	25.8		0.0
Delay (s)	161.0	21.7	4.9	170.8	6.9	6.1	128.7	125.5	153.4	158.3		124.8
Level of Service	F	C	A	F	A	A	F	F	F	F		F
Approach Delay (s)		23.8			13.3			148.0			151.6	
Approach LOS		C			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	293.6	Sum of lost time (s)	21.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	587	588	60	300	900	550	125
v/c Ratio	0.83	0.84	0.06	0.70	0.52	0.49	0.10
Control Delay	51.9	52.0	1.1	36.7	28.7	45.4	1.2
Queue Delay	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	52.3	1.1	36.7	28.7	45.4	1.2
Queue Length 50th (ft)	569	570	0	191	337	292	3
Queue Length 95th (ft)	672	673	10	325	426	353	0
Internal Link Dist (ft)		655			1415	1227	
Turn Bay Length (ft)	515		320	330			260
Base Capacity (vph)	736	736	980	438	1734	1113	1291
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	14	14	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.81	0.06	0.68	0.52	0.49	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1175	0	60	0	0	0	300	900	0	0	550	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0				7.0	7.5			7.5	7.0
Lane Util. Factor	0.95	0.95	1.00				1.00	0.95			0.95	1.00
Frt	1.00	1.00	0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1681	1583				1770	3539			3539	1583
Flt Permitted	0.95	0.95	1.00				0.29	1.00			1.00	1.00
Satd. Flow (perm)	1681	1681	1583				534	3539			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1175	0	60	0	0	0	300	900	0	0	550	125
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	0	0	0	33
Lane Group Flow (vph)	587	588	36	0	0	0	300	900	0	0	550	92
Turn Type	Split	NA	pt+ov	Split			pm+pt	NA		Perm	NA	pm+ov
Protected Phases	4	4	4 5	3	3		5	2			6	4
Permitted Phases							2			6		6
Actuated Green, G (s)	67.1	67.1	95.2				78.4	78.4			50.3	117.4
Effective Green, g (s)	67.1	67.1	95.2				78.4	78.4			50.3	117.4
Actuated g/C Ratio	0.42	0.42	0.60				0.49	0.49			0.31	0.73
Clearance Time (s)	7.0	7.0					7.0	7.5			7.5	7.0
Vehicle Extension (s)	5.0	5.0					4.0	4.0			4.0	5.0
Lane Grp Cap (vph)	704	704	941				424	1734			1112	1161
v/s Ratio Prot	0.35	c0.35	0.02				c0.09	0.25			0.16	0.03
v/s Ratio Perm							c0.25					0.02
v/c Ratio	0.83	0.84	0.04				0.71	0.52			0.49	0.08
Uniform Delay, d1	41.5	41.5	13.4				27.1	27.9			44.5	6.0
Progression Factor	1.00	1.00	1.00				1.03	0.94			0.93	1.52
Incremental Delay, d2	9.3	9.4	0.0				5.2	1.0			1.5	0.1
Delay (s)	50.8	50.9	13.5				33.0	27.1			43.1	9.2
Level of Service	D	D	B				C	C			D	A
Approach Delay (s)		49.0			0.0			28.6			36.8	
Approach LOS		D			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	178	182	175	10	40	2100	10	525	250
v/c Ratio	0.90	0.92	0.38	0.06	0.06	0.82	0.08	0.22	0.16
Control Delay	112.0	114.8	8.9	0.7	18.4	20.4	4.9	3.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.2	0.0
Total Delay	112.0	114.8	8.9	0.7	18.4	21.8	4.9	3.4	0.2
Queue Length 50th (ft)	196	201	0	0	21	368	0	14	0
Queue Length 95th (ft)	#351	#360	65	0	m54	1181	4	38	0
Internal Link Dist (ft)		625				1227		378	
Turn Bay Length (ft)	400		540		510		150		
Base Capacity (vph)	199	200	461	166	649	2566	126	2389	1583
Starvation Cap Reductn	0	0	0	0	0	118	0	1002	0
Spillback Cap Reductn	0	0	0	0	0	266	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.91	0.38	0.06	0.06	0.91	0.08	0.38	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	10	175	0	0	10	40	2100	0	10	525	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			7.0	7.0	7.0		7.0	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00			1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85			0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00			1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1690	1583			1583	1770	3539		1770	3539	1583
Flt Permitted	0.95	0.95	1.00			1.00	0.42	1.00		0.04	1.00	1.00
Satd. Flow (perm)	1681	1690	1583			1583	784	3539		73	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	10	175	0	0	10	40	2100	0	10	525	250
RTOR Reduction (vph)	0	0	146	0	0	10	0	0	0	0	0	0
Lane Group Flow (vph)	178	182	29	0	0	0	40	2100	0	10	525	250
Turn Type	Split	NA	pm+ov	Split		pm+ov	pm+pt	NA		pm+pt	NA	Free
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2			6		Free
Actuated Green, G (s)	18.8	18.8	26.8			5.6	115.6	107.6		105.2	102.4	160.0
Effective Green, g (s)	18.8	18.8	26.8			5.6	115.6	107.6		105.2	102.4	160.0
Actuated g/C Ratio	0.12	0.12	0.17			0.03	0.72	0.67		0.66	0.64	1.00
Clearance Time (s)	7.0	7.0	7.0			7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	198	334			55	615	2379		77	2264	1583
v/s Ratio Prot	0.11	c0.11	0.00			0.00	0.00	c0.59		0.00	0.15	
v/s Ratio Perm			0.01			0.00	0.04			0.08		c0.16
v/c Ratio	0.90	0.92	0.09			0.01	0.07	0.88		0.13	0.23	0.16
Uniform Delay, d1	69.7	69.8	56.3			74.5	6.5	21.1		26.0	12.2	0.0
Progression Factor	1.00	1.00	1.00			1.00	3.04	1.01		0.55	0.27	1.00
Incremental Delay, d2	38.2	41.4	0.1			0.0	0.0	4.1		0.7	0.2	0.2
Delay (s)	107.9	111.2	56.4			74.6	19.9	25.4		15.0	3.5	0.2
Level of Service	F	F	E			E	B	C		B	A	A
Approach Delay (s)		92.2			74.6			25.3			2.6	
Approach LOS		F			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBT
Lane Group Flow (vph)	225	3150	1725	125	195
v/c Ratio	0.67	0.84	0.69	0.15	0.67
Control Delay	64.0	14.2	27.7	3.8	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	14.2	27.7	3.8	50.1
Queue Length 50th (ft)	174	554	378	0	99
Queue Length 95th (ft)	359	834	600	36	243
Internal Link Dist (ft)		837	1008		920
Turn Bay Length (ft)	640			600	
Base Capacity (vph)	545	4787	3905	1245	446
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.66	0.44	0.10	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	3150	0	0	1725	125	70	0	125	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	8.0			8.0	8.0		7.0				
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00				
Frt	1.00	1.00			1.00	0.85		0.91				
Flt Protected	0.95	1.00			1.00	1.00		0.98				
Satd. Flow (prot)	1770	5085			5085	1583		1672				
Flt Permitted	0.95	1.00			1.00	1.00		0.98				
Satd. Flow (perm)	1770	5085			5085	1583		1672				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	3150	0	0	1725	125	70	0	125	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	62	0	60	0	0	0	0
Lane Group Flow (vph)	225	3150	0	0	1725	63	0	135	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			7				
Permitted Phases						6	7					
Actuated Green, G (s)	25.1	98.0			65.9	65.9		18.1				
Effective Green, g (s)	25.1	98.0			65.9	65.9		18.1				
Actuated g/C Ratio	0.19	0.75			0.50	0.50		0.14				
Clearance Time (s)	7.0	8.0			8.0	8.0		7.0				
Vehicle Extension (s)	4.0	3.0			3.0	3.0		4.0				
Lane Grp Cap (vph)	338	3801			2556	795		230				
v/s Ratio Prot	0.13	c0.62			0.34							
v/s Ratio Perm						0.04		0.08				
v/c Ratio	0.67	0.83			0.67	0.08		0.59				
Uniform Delay, d1	49.1	11.0			24.5	16.9		53.0				
Progression Factor	1.00	1.00			1.00	1.00		1.00				
Incremental Delay, d2	5.4	1.6			0.7	0.0		4.4				
Delay (s)	54.5	12.6			25.3	16.9		57.4				
Level of Service	D	B			C	B		E				
Approach Delay (s)		15.4			24.7			57.4			0.0	
Approach LOS		B			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	131.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	200	200	925	250	175	250	625
v/c Ratio	0.24	0.24	0.98	0.43	0.62	0.24	0.58
Control Delay	28.7	28.7	54.9	81.4	26.3	3.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total Delay	28.7	28.7	54.9	81.4	26.3	3.7	4.7
Queue Length 50th (ft)	146	146	857	84	27	5	15
Queue Length 95th (ft)	222	222	#1248	114	117	m2	m5
Internal Link Dist (ft)		906		517			268
Turn Bay Length (ft)			430		60		
Base Capacity (vph)	825	825	941	664	299	1554	1602
Starvation Cap Reductn	0	0	0	0	0	474	228
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.24	0.98	0.38	0.59	0.23	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	0	925	0	0	0	0	250	175	250	625	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Lane Util. Factor	0.95	0.95	1.00					0.86	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					6408	1583	3433	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					6408	1583	3433	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	0	925	0	0	0	0	250	175	250	625	0
RTOR Reduction (vph)	0	0	164	0	0	0	0	0	137	0	0	0
Lane Group Flow (vph)	200	200	761	0	0	0	0	250	38	250	625	0
Turn Type	Split	NA	Perm					NA	Perm	Split	NA	
Protected Phases	2	2						1		6 8	6 8	
Permitted Phases			2						1			
Actuated Green, G (s)	90.1	90.1	90.1					16.6	16.6	55.7	55.7	
Effective Green, g (s)	90.1	90.1	90.1					16.6	16.6	55.7	55.7	
Actuated g/C Ratio	0.49	0.49	0.49					0.09	0.09	0.30	0.30	
Clearance Time (s)	7.0	7.0	7.0					7.0	7.0			
Vehicle Extension (s)	3.0	3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)	825	825	777					580	143	1042	1074	
v/s Ratio Prot	0.12	0.12						c0.04		0.07	c0.18	
v/s Ratio Perm			c0.48						0.02			
v/c Ratio	0.24	0.24	0.98					0.43	0.26	0.24	0.58	
Uniform Delay, d1	26.9	26.9	45.7					78.9	77.7	48.0	54.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.07	0.06	
Incremental Delay, d2	0.2	0.2	26.8					0.7	1.3	0.1	0.4	
Delay (s)	27.1	27.1	72.5					79.6	79.0	3.4	3.7	
Level of Service	C	C	E					E	E	A	A	
Approach Delay (s)		58.8			0.0			79.4			3.6	
Approach LOS		E			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	183.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	30	30	1150	100	500	1250	60
v/c Ratio	0.43	0.43	0.73	0.05	0.23	0.87	0.14
Control Delay	104.5	104.5	2.9	1.3	2.8	76.5	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	104.5	104.5	2.9	1.3	3.2	76.5	2.9
Queue Length 50th (ft)	37	37	0	3	10	430	0
Queue Length 95th (ft)	81	81	0	184	9	494	12
Internal Link Dist (ft)		774			268	733	
Turn Bay Length (ft)	460		450				220
Base Capacity (vph)	320	320	1583	2092	2156	1432	425
Starvation Cap Reductn	0	0	0	0	1092	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.09	0.73	0.05	0.47	0.87	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	0	1150	100	500	0	0	1250	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	4.0	7.0	7.0			7.0	7.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.86	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1681	1583	3433	3539			6408	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1681	1583	3433	3539			6408	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	60	0	1150	100	500	0	0	1250	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	47
Lane Group Flow (vph)	0	0	0	30	30	1150	100	500	0	0	1250	13
Turn Type				Split	NA	Free	Split	NA			NA	Perm
Protected Phases				8	8		1 2	1 2			6	
Permitted Phases						Free						6
Actuated Green, G (s)				7.7	7.7	183.4	113.7	113.7			41.0	41.0
Effective Green, g (s)				7.7	7.7	183.4	113.7	113.7			41.0	41.0
Actuated g/C Ratio				0.04	0.04	1.00	0.62	0.62			0.22	0.22
Clearance Time (s)				7.0	7.0						7.0	7.0
Vehicle Extension (s)				3.0	3.0						3.0	3.0
Lane Grp Cap (vph)				70	70	1583	2128	2194			1432	353
v/s Ratio Prot				0.02	0.02		0.03	0.14			c0.20	
v/s Ratio Perm						c0.73						0.01
v/c Ratio				0.43	0.43	0.73	0.05	0.23			0.87	0.04
Uniform Delay, d1				85.7	85.7	0.0	13.6	15.4			68.7	55.8
Progression Factor				1.00	1.00	1.00	0.09	0.16			1.00	1.00
Incremental Delay, d2				4.2	4.2	2.9	0.0	0.1			6.2	0.0
Delay (s)				89.9	89.9	2.9	1.2	2.6			74.9	55.8
Level of Service				F	F	A	A	A			E	E
Approach Delay (s)		0.0			7.3			2.4			74.0	
Approach LOS		A			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	183.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	725	1075	625	70	1225	225	1100	475	70	80	250	450
v/c Ratio	1.36	0.80	0.72	0.71	1.23	0.38	1.52	0.40	0.11	0.48	0.39	0.96
Control Delay	221.0	50.4	18.2	130.1	147.9	6.6	282.4	35.6	2.5	86.0	52.5	56.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	221.0	50.4	18.2	130.1	147.9	6.6	282.4	35.6	2.5	86.0	52.5	56.2
Queue Length 50th (ft)	~547	543	187	77	~814	40	~813	178	0	44	88	122
Queue Length 95th (ft)	#678	636	354	#159	#961	55	#985	175	m13	75	123	#300
Internal Link Dist (ft)		1623			621			1129			657	
Turn Bay Length (ft)	560			330			415		305	365		275
Base Capacity (vph)	533	1342	865	102	995	600	722	1238	667	171	707	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.36	0.80	0.72	0.69	1.23	0.38	1.52	0.38	0.10	0.47	0.35	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	725	1075	625	70	1225	225	1100	475	70	80	250	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3416	3522	1575	1770	3539	1577	3614	3539	1577	3433	3539	1577
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3416	3522	1575	1770	3539	1577	3614	3539	1577	3433	3539	1577
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	725	1075	625	70	1225	225	1100	475	70	80	250	450
RTOR Reduction (vph)	0	0	265	0	0	157	0	0	47	0	0	184
Lane Group Flow (vph)	725	1075	360	70	1225	68	1100	475	23	80	250	266
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	1	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	25.0	61.0	61.0	9.0	45.0	45.0	32.0	53.3	53.3	7.7	29.0	29.0
Effective Green, g (s)	25.0	61.0	61.0	9.0	45.0	45.0	32.0	53.3	53.3	7.7	29.0	29.0
Actuated g/C Ratio	0.16	0.38	0.38	0.06	0.28	0.28	0.20	0.33	0.33	0.05	0.18	0.18
Clearance Time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	4.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	533	1342	600	99	995	443	722	1178	525	165	641	285
v/s Ratio Prot	c0.21	0.31		0.04	c0.35		c0.30	0.13		0.02	0.07	
v/s Ratio Perm			0.23			0.04			0.01			c0.17
v/c Ratio	1.36	0.80	0.60	0.71	1.23	0.15	1.52	0.40	0.04	0.48	0.39	0.93
Uniform Delay, d1	67.5	44.1	39.7	74.2	57.5	43.2	64.0	41.1	36.1	74.2	57.7	64.5
Progression Factor	1.00	1.00	1.00	1.38	0.72	0.88	1.04	0.86	1.00	1.03	0.89	0.76
Incremental Delay, d2	174.0	5.1	4.4	17.7	111.6	0.6	240.2	0.1	0.0	2.2	0.4	34.9
Delay (s)	241.5	49.2	44.1	120.2	152.8	38.5	306.8	35.3	36.1	78.5	51.6	83.8
Level of Service	F	D	D	F	F	D	F	D	D	E	D	F
Approach Delay (s)		105.4			134.4			216.9			73.0	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	137.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	118.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	SER	NWL	NWR	NET	NER	SWL	SWT
Lane Group Flow (vph)	650	225	225	6	14	400	108	97	50
v/c Ratio	0.80	0.21	0.21	0.06	0.04	0.26	0.14	0.20	0.03
Control Delay	54.6	0.4	0.4	58.0	0.2	3.0	0.4	21.1	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0
Total Delay	54.6	0.4	0.4	58.0	0.2	3.1	0.7	21.1	20.3
Queue Length 50th (ft)	261	0	0	5	0	7	0	39	10
Queue Length 95th (ft)	331	0	0	19	0	8	1	90	26
Internal Link Dist (ft)		377				190			349
Turn Bay Length (ft)	200		200					400	
Base Capacity (vph)	871	1106	1106	381	573	1533	771	483	1837
Starvation Cap Reductn	0	0	0	0	0	421	343	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.20	0.20	0.02	0.02	0.36	0.25	0.20	0.03

Intersection Summary

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	650	0	450	6	0	14	0	400	108	97	50	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	0.95	1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.85	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1504	1504	1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.42	1.00	
Satd. Flow (perm)	3433	1504	1504	1770		1583		3539	1583	778	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	650	0	450	6	0	14	0	400	108	97	50	0
RTOR Reduction (vph)	0	172	172	0	0	12	0	0	62	0	0	0
Lane Group Flow (vph)	650	53	53	6	0	2	0	400	46	97	50	0
Turn Type	Split	NA	Prot	Prot		custom		NA	Perm	pm+pt	NA	
Protected Phases	4	4	4	3		3 5		6		5	2	
Permitted Phases									6	2		
Actuated Green, G (s)	30.9	30.9	30.9	6.4		16.2		54.9	54.9	61.9	61.9	
Effective Green, g (s)	30.9	30.9	30.9	6.4		16.2		54.9	54.9	61.9	61.9	
Actuated g/C Ratio	0.24	0.24	0.24	0.05		0.12		0.42	0.42	0.48	0.48	
Clearance Time (s)	7.0	7.0	7.0	7.0				7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	815	357	357	87		197		1494	668	445	1685	
v/s Ratio Prot	c0.19	0.04	0.04	c0.00		0.00		c0.11		c0.02	0.01	
v/s Ratio Perm									0.03	0.09		
v/c Ratio	0.80	0.15	0.15	0.07		0.01		0.27	0.07	0.22	0.03	
Uniform Delay, d1	46.6	39.2	39.2	59.0		49.9		24.5	22.3	19.3	18.1	
Progression Factor	1.00	1.00	1.00	1.00		1.00		0.10	0.01	1.00	1.00	
Incremental Delay, d2	5.5	0.2	0.2	0.3		0.0		0.4	0.2	0.2	0.0	
Delay (s)	52.1	39.4	39.4	59.3		49.9		2.9	0.4	19.5	18.1	
Level of Service	D	D	D	E		D		A	A	B	B	
Approach Delay (s)		46.9			52.7			2.3			19.1	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NET	SWT
Lane Group Flow (vph)	290	775	40
v/c Ratio	0.72	0.41	0.01
Control Delay	32.3	10.5	8.4
Queue Delay	0.0	0.0	0.0
Total Delay	32.3	10.5	8.4
Queue Length 50th (ft)	104	89	2
Queue Length 95th (ft)	167	143	7
Internal Link Dist (ft)	1324	350	136
Turn Bay Length (ft)			
Base Capacity (vph)	503	1900	2730
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.58	0.41	0.01

Intersection Summary

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	40	250	775	0	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.91
Frt	0.88		1.00			1.00
Flt Protected	0.99		1.00			1.00
Satd. Flow (prot)	1635		3539			5085
Flt Permitted	0.99		1.00			1.00
Satd. Flow (perm)	1635		3539			5085
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	250	775	0	0	40
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	290	0	775	0	0	40
Turn Type	NA		NA			NA
Protected Phases	4		6			2
Permitted Phases						
Actuated Green, G (s)	16.1		34.9			34.9
Effective Green, g (s)	16.1		34.9			34.9
Actuated g/C Ratio	0.25		0.54			0.54
Clearance Time (s)	7.0		7.0			7.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	404		1900			2730
v/s Ratio Prot	c0.18		c0.22			0.01
v/s Ratio Perm						
v/c Ratio	0.72		0.41			0.01
Uniform Delay, d1	22.4		8.9			7.0
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	6.0		0.7			0.0
Delay (s)	28.4		9.6			7.0
Level of Service	C		A			A
Approach Delay (s)	28.4		9.6			7.0
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	70	150	1125	400	250
v/c Ratio	0.19	0.59	0.42	0.21	0.22
Control Delay	1.1	41.3	4.0	11.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	41.3	4.0	11.6	5.5
Queue Length 50th (ft)	0	71	78	38	10
Queue Length 95th (ft)	1	125	110	124	99
Internal Link Dist (ft)	455		930	1767	
Turn Bay Length (ft)		300			300
Base Capacity (vph)	462	309	2685	1865	1194
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.49	0.42	0.21	0.21

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	50	20	150	1125	400	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0	6.5	6.5	7.0
Lane Util. Factor	0.97		1.00	0.95	0.95	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3340		1770	3539	3539	1583
Flt Permitted	0.97		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3340		1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	20	150	1125	400	250
RTOR Reduction (vph)	65	0	0	0	0	100
Lane Group Flow (vph)	5	0	150	1125	400	150
Turn Type	NA		Prot	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases						6
Actuated Green, G (s)	5.8		11.5	60.7	42.2	48.0
Effective Green, g (s)	5.8		11.5	60.7	42.2	48.0
Actuated g/C Ratio	0.07		0.14	0.76	0.53	0.60
Clearance Time (s)	7.0		7.0	6.5	6.5	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	242		254	2685	1866	949
v/s Ratio Prot	0.00		c0.08	c0.32	0.11	c0.01
v/s Ratio Perm						0.08
v/c Ratio	0.02		0.59	0.42	0.21	0.16
Uniform Delay, d1	34.5		32.0	3.4	10.1	7.1
Progression Factor	1.00		1.00	1.00	1.08	9.10
Incremental Delay, d2	0.0		3.6	0.5	0.3	0.1
Delay (s)	34.5		35.7	3.9	11.2	64.4
Level of Service	C		D	A	B	E
Approach Delay (s)	34.5			7.6	31.6	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	575	200	750	1625	275	1750	550
v/c Ratio	0.85	0.38	0.83	0.58	0.79	0.89	0.79	0.35
Control Delay	117.8	0.7	115.6	14.1	57.6	113.0	33.0	0.6
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	117.8	0.7	115.6	14.3	57.6	113.0	33.0	0.6
Queue Length 50th (ft)	272	0	253	104	757	372	973	0
Queue Length 95th (ft)	#393	0	#385	165	824	#516	1068	0
Internal Link Dist (ft)	610				1235		338	
Turn Bay Length (ft)		270		365		390		
Base Capacity (vph)	257	1530	260	1278	2051	337	2222	1584
Starvation Cap Reductn	0	0	0	125	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.38	0.77	0.65	0.79	0.82	0.79	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	200	575	200	0	750	0	1425	200	275	1750	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			3%			1%			-4%	
Total Lost time (s)		7.0	4.0	7.0		7.0		7.0		7.0	7.0	4.0
Lane Util. Factor		1.00	1.00	1.00		0.88		0.91		1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85		0.98		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)		1800	1530	1710		2692		4871		1770	3541	1584
Flt Permitted		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)		1800	1530	1710		2692		4871		1770	3541	1584
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	200	575	200	0	750	0	1425	200	275	1750	550
RTOR Reduction (vph)	0	0	0	0	0	346	0	8	0	0	0	0
Lane Group Flow (vph)	0	200	575	200	0	404	0	1617	0	275	1750	550
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Free	Prot		custom		NA		Prot	NA	Free
Protected Phases		3		4		4 1		2		1	6	
Permitted Phases			Free									Free
Actuated Green, G (s)		27.6	210.0	29.6		73.3		88.1		36.7	131.8	210.0
Effective Green, g (s)		27.6	210.0	29.6		73.3		88.1		36.7	131.8	210.0
Actuated g/C Ratio		0.13	1.00	0.14		0.35		0.42		0.17	0.63	1.00
Clearance Time (s)		7.0		7.0				7.0		7.0	7.0	
Vehicle Extension (s)		4.0		4.0				5.0		4.0	5.0	
Lane Grp Cap (vph)		236	1530	241		939		2043		309	2222	1584
v/s Ratio Prot		c0.11		c0.12		0.15		0.33		c0.16	c0.49	
v/s Ratio Perm			0.38									0.35
v/c Ratio		0.85	0.38	0.83		0.43		0.79		0.89	0.79	0.35
Uniform Delay, d1		89.1	0.0	87.8		52.3		53.0		84.7	28.8	0.0
Progression Factor		1.00	1.00	1.02		0.86		1.00		1.00	1.00	1.00
Incremental Delay, d2		24.3	0.7	21.3		0.4		3.2		25.8	2.9	0.6
Delay (s)		113.4	0.7	110.6		45.6		56.2		110.5	31.7	0.6
Level of Service		F	A	F		D		E		F	C	A
Approach Delay (s)		29.8			59.3			56.2			33.5	
Approach LOS		C			E			E			C	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	210.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	10	20	20	40	70	1125	30	100	2700	250
v/c Ratio	1.05	0.08	0.10	0.44	0.28	0.79	0.44	0.03	0.28	0.98	0.27
Control Delay	175.4	83.5	0.9	120.5	4.8	84.0	11.1	0.0	6.5	36.2	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.7	0.0
Total Delay	175.4	83.5	0.9	120.5	4.8	84.0	11.1	0.0	6.5	61.8	4.6
Queue Length 50th (ft)	~168	12	0	25	0	38	287	0	25	1614	42
Queue Length 95th (ft)	#324	36	0	#62	0	#144	328	0	40	#1903	78
Internal Link Dist (ft)		602		1004			953			1235	
Turn Bay Length (ft)	80		80			360		390	380		
Base Capacity (vph)	119	133	209	45	143	89	2561	1169	352	2769	942
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	225	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.08	0.10	0.44	0.28	0.79	0.44	0.03	0.28	1.06	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	10	20	10	10	40	70	1125	30	100	2700	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1740	1516	1752	3505	1562	1752	3774	1237
Flt Permitted	0.95	1.00	1.00		0.98	1.00	0.03	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1740	1516	54	3505	1562	403	3774	1237
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	10	20	10	10	40	70	1125	30	100	2700	250
RTOR Reduction (vph)	0	0	19	0	0	39	0	0	8	0	0	36
Lane Group Flow (vph)	125	10	1	0	20	1	70	1125	22	100	2700	214
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	30%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	14.0	14.0	14.0		4.0	4.0	142.9	137.4	137.4	144.1	138.0	138.0
Effective Green, g (s)	14.0	14.0	14.0		4.0	4.0	142.9	137.4	137.4	144.1	138.0	138.0
Actuated g/C Ratio	0.07	0.07	0.07		0.02	0.02	0.75	0.72	0.72	0.76	0.73	0.73
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	119	133	111		36	31	89	2534	1129	348	2741	898
v/s Ratio Prot	c0.08	0.01			c0.01		c0.02	0.32		0.01	c0.72	
v/s Ratio Perm			0.00			0.00	0.57		0.01	0.21		0.17
v/c Ratio	1.05	0.08	0.01		0.56	0.03	0.79	0.44	0.02	0.29	0.99	0.24
Uniform Delay, d1	88.0	82.0	81.6		92.1	91.1	63.0	10.7	7.4	7.1	25.0	8.6
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	96.7	0.9	0.2		17.3	0.4	35.5	0.6	0.0	0.5	14.0	0.6
Delay (s)	184.7	82.8	81.8		109.4	91.5	98.5	11.3	7.4	7.5	39.0	9.2
Level of Service	F	F	F		F	F	F	B	A	A	D	A
Approach Delay (s)		164.8			97.4			16.2			35.6	
Approach LOS		F			F			B			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	50	1200	100	175	2475
v/c Ratio	0.29	0.44	0.43	0.08	0.44	0.78
Control Delay	107.0	28.4	5.7	0.7	5.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.5
Total Delay	107.0	28.4	5.7	0.7	5.0	7.9
Queue Length 50th (ft)	27	0	226	0	25	562
Queue Length 95th (ft)	62	45	267	13	37	628
Internal Link Dist (ft)	56		3201			953
Turn Bay Length (ft)				350	405	
Base Capacity (vph)	72	117	2823	1280	421	3168
Starvation Cap Reductn	0	0	0	0	0	473
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.43	0.43	0.08	0.42	0.92

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	50	1200	100	175	2475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		4%			-1%
Total Lost time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1388	1242	3402	1522	1744	3489
Flt Permitted	0.95	1.00	1.00	1.00	0.21	1.00
Satd. Flow (perm)	1388	1242	3402	1522	382	3489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	50	1200	100	175	2475
RTOR Reduction (vph)	0	48	0	18	0	0
Lane Group Flow (vph)	20	2	1200	82	175	2475
Heavy Vehicles (%)	30%	30%	4%	4%	4%	4%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	8.5	8.5	172.9	172.9	188.0	188.0
Effective Green, g (s)	8.5	8.5	172.9	172.9	188.0	188.0
Actuated g/C Ratio	0.04	0.04	0.82	0.82	0.90	0.90
Clearance Time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Vehicle Extension (s)	5.0	5.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	56	50	2800	1253	394	3123
v/s Ratio Prot	c0.01		0.35		0.02	c0.71
v/s Ratio Perm		0.00		0.05	0.38	
v/c Ratio	0.36	0.04	0.43	0.07	0.44	0.79
Uniform Delay, d1	98.1	96.8	5.1	3.5	3.0	4.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	0.7	0.5	0.1	0.8	2.2
Delay (s)	106.1	97.5	5.5	3.6	3.8	6.1
Level of Service	F	F	A	A	A	A
Approach Delay (s)	100.0		5.4			6.0
Approach LOS	F		A			A

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	210.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	500	470	750	10	120	40	350	30	600
v/c Ratio	2.14	0.49	1.07	0.01	0.65	0.13	0.84	0.07	1.49
Control Delay	546.5	20.0	98.1	0.0	80.6	0.8	61.8	36.6	264.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	546.5	20.0	98.1	0.0	80.6	0.8	61.8	36.6	264.2
Queue Length 50th (ft)	~739	311	~809	0	115	0	343	26	~819
Queue Length 95th (ft)	#963	431	#1133	0	178	0	m413	m38	m#993
Internal Link Dist (ft)		3024	1297		1097			1436	
Turn Bay Length (ft)	220						380		
Base Capacity (vph)	234	961	702	711	332	434	419	441	404
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.14	0.49	1.07	0.01	0.36	0.09	0.84	0.07	1.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	500	450	20	0	750	10	60	60	40	350	30	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050
Grade (%)		3%			-2%			4%			-3%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1743	1823			1881	1599		1781	1552	1796	1891	1734
Flt Permitted	0.06	1.00			1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	116	1823			1881	1599		1781	1552	1796	1891	1734
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	500	450	20	0	750	10	60	60	40	350	30	600
RTOR Reduction (vph)	0	1	0	0	0	6	0	0	36	0	0	0
Lane Group Flow (vph)	500	469	0	0	750	4	0	120	4	350	30	600
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2			3			4
Actuated Green, G (s)	79.0	79.0			56.0	56.0		15.5	15.5	35.0	35.0	35.0
Effective Green, g (s)	79.0	79.0			56.0	56.0		15.5	15.5	35.0	35.0	35.0
Actuated g/C Ratio	0.53	0.53			0.37	0.37		0.10	0.10	0.23	0.23	0.23
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.5	4.0			4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	234	960			702	596		184	160	419	441	404
v/s Ratio Prot	c0.23	0.26			0.40			c0.07		0.19	0.02	
v/s Ratio Perm	c0.89					0.00			0.00			c0.35
v/c Ratio	2.14	0.49			1.07	0.01		0.65	0.03	0.84	0.07	1.49
Uniform Delay, d1	50.0	22.6			47.0	29.5		64.7	60.5	54.8	44.8	57.5
Progression Factor	0.71	0.78			1.00	1.00		1.00	1.00	0.87	0.81	0.89
Incremental Delay, d2	523.9	1.6			53.7	0.0		8.0	0.1	10.2	0.0	227.9
Delay (s)	559.4	19.2			100.7	29.5		72.7	60.5	58.1	36.1	278.9
Level of Service	F	B			F	C		E	E	E	D	F
Approach Delay (s)		297.6			99.8			69.6			192.6	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	196.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.81		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	825	450	450	625	450	425
v/c Ratio	0.56	0.49	0.79	0.28	0.86	0.30
Control Delay	28.9	12.8	69.8	19.7	65.6	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	12.8	69.8	19.7	65.6	17.8
Queue Length 50th (ft)	311	152	239	186	416	111
Queue Length 95th (ft)	406	251	m191	m161	505	123
Internal Link Dist (ft)	1397			2206	847	
Turn Bay Length (ft)		400	500		300	
Base Capacity (vph)	1480	923	640	2207	649	1487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.49	0.70	0.28	0.69	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	825	450	450	625	450	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	825	450	450	625	450	425
RTOR Reduction (vph)	0	262	0	0	0	32
Lane Group Flow (vph)	825	188	450	625	450	393
Turn Type	NA	Perm	Prot	NA	NA	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	62.7	62.7	24.8	93.5	44.5	75.3
Effective Green, g (s)	62.7	62.7	24.8	93.5	44.5	75.3
Actuated g/C Ratio	0.42	0.42	0.17	0.62	0.30	0.50
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1479	661	567	2205	525	1399
v/s Ratio Prot	c0.23		c0.13	0.18	c0.25	0.14
v/s Ratio Perm		0.12				
v/c Ratio	0.56	0.28	0.79	0.28	0.86	0.28
Uniform Delay, d1	33.1	28.8	60.1	12.9	49.8	21.7
Progression Factor	0.78	3.67	1.15	1.41	1.00	1.00
Incremental Delay, d2	1.3	0.9	0.7	0.0	13.0	0.1
Delay (s)	27.1	106.9	69.8	18.3	62.8	21.8
Level of Service	C	F	E	B	E	C
Approach Delay (s)	55.2			39.8	42.8	
Approach LOS	E			D	D	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	20	1375	200	80	1075	30	10
v/c Ratio	0.05	0.50	0.16	0.25	0.36	0.29	0.06
Control Delay	1.4	3.6	0.2	1.7	5.6	73.7	0.7
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	1.4	3.9	0.2	1.7	5.6	73.7	0.7
Queue Length 50th (ft)	1	57	0	8	251	29	0
Queue Length 95th (ft)	m3	m68	m0	m5	m205	64	0
Internal Link Dist (ft)		603			592	815	
Turn Bay Length (ft)	180		290	400			680
Base Capacity (vph)	444	2724	1262	362	2949	153	206
Starvation Cap Reductn	0	598	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.65	0.16	0.22	0.36	0.20	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1375	200	80	1075	0	30	0	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00			
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00			
Satd. Flow (prot)	1752	3504	1567	1787	3575			1770	1583			
Flt Permitted	0.25	1.00	1.00	0.16	1.00			0.95	1.00			
Satd. Flow (perm)	469	3504	1567	308	3575			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	1375	200	80	1075	0	30	0	10	0	0	0
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	9	0	0	0
Lane Group Flow (vph)	20	1375	154	80	1075	0	0	30	1	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4		4	8		
Actuated Green, G (s)	118.9	115.3	115.3	124.9	118.3			7.6	7.6			
Effective Green, g (s)	118.9	115.3	115.3	124.9	118.3			7.6	7.6			
Actuated g/C Ratio	0.79	0.77	0.77	0.83	0.79			0.05	0.05			
Clearance Time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0			3.0	3.0			
Lane Grp Cap (vph)	402	2693	1204	321	2819			89	80			
v/s Ratio Prot	0.00	c0.39		c0.01	c0.30							
v/s Ratio Perm	0.04		0.10	0.20				0.02	0.00			
v/c Ratio	0.05	0.51	0.13	0.25	0.38			0.34	0.01			
Uniform Delay, d1	3.3	6.6	4.5	3.9	4.8			68.8	67.6			
Progression Factor	0.58	0.45	0.03	0.72	1.14			1.00	1.00			
Incremental Delay, d2	0.0	0.5	0.2	0.0	0.0			2.2	0.0			
Delay (s)	2.0	3.5	0.3	2.8	5.5			71.0	67.6			
Level of Service	A	A	A	A	A			E	E			
Approach Delay (s)		3.1			5.3			70.2			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	350	900	200	175	300	275	100	10	450	450	200
v/c Ratio	0.72	0.49	0.22	0.57	0.16	0.24	0.43	0.02	1.43	0.53	0.25
Control Delay	70.3	24.2	3.4	77.1	24.5	0.9	72.8	0.1	248.3	49.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	24.2	3.4	77.1	24.5	0.9	72.8	0.1	248.3	49.5	1.6
Queue Length 50th (ft)	171	287	3	93	68	4	50	0	~507	183	2
Queue Length 95th (ft)	220	376	47	132	98	14	82	0	#691	194	13
Internal Link Dist (ft)		1562			603		1172			469	
Turn Bay Length (ft)	440		360	365		410		360	300		290
Base Capacity (vph)	492	1835	916	307	1825	1157	1074	581	314	1347	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.49	0.22	0.57	0.16	0.24	0.09	0.02	1.43	0.33	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

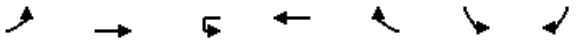
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	900	200	175	300	275	0	100	10	450	450	200
Ideal Flow (vphpl)	2000	1900	1900	1900	2000	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-5%			-3%			-4%	
Total Lost time (s)	7.0	7.5	7.0	7.0	7.5	7.0		7.5	7.0	7.0	7.5	7.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3541	3468	1552	3519	3819	1623		3664	1639	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	3541	3468	1552	3519	3819	1623		3664	1639	757	3610	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	900	200	175	300	275	0	100	10	450	450	200
RTOR Reduction (vph)	0	0	91	0	0	109	0	0	8	0	0	125
Lane Group Flow (vph)	350	900	109	175	300	166	0	100	2	450	450	75
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	20.7	79.4	79.4	13.0	71.7	90.7		9.6	22.6	35.6	35.6	56.3
Effective Green, g (s)	20.7	79.4	79.4	13.0	71.7	90.7		9.6	22.6	35.6	35.6	56.3
Actuated g/C Ratio	0.14	0.53	0.53	0.09	0.48	0.60		0.06	0.15	0.24	0.24	0.38
Clearance Time (s)	7.0	7.5	7.0	7.0	7.5	7.0		7.5	7.0	7.0	7.5	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	488	1835	821	304	1825	981		234	246	312	856	606
v/s Ratio Prot	c0.10	c0.26		0.05	0.08	0.02		0.03	0.00	c0.18	0.12	0.02
v/s Ratio Perm			0.07			0.08			0.00	c0.16		0.03
v/c Ratio	0.72	0.49	0.13	0.58	0.16	0.17		0.43	0.01	1.44	0.53	0.12
Uniform Delay, d1	61.8	22.4	17.9	65.8	22.2	13.1		67.6	54.2	54.6	49.8	30.7
Progression Factor	1.00	1.00	1.00	1.07	1.05	0.33		1.00	1.00	0.95	0.95	0.32
Incremental Delay, d2	5.0	0.9	0.1	2.5	0.2	0.1		1.3	0.0	214.9	0.5	0.1
Delay (s)	66.8	23.4	17.9	72.9	23.6	4.4		68.8	54.2	267.0	47.9	9.8
Level of Service	E	C	B	E	C	A		E	D	F	D	A
Approach Delay (s)		33.1			28.0			67.5			130.6	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	64.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	70	1075	440	235
v/c Ratio	0.14	0.56	0.35	0.54
Control Delay	7.4	9.9	15.6	20.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.4	9.9	15.6	20.7
Queue Length 50th (ft)	10	109	56	55
Queue Length 95th (ft)	30	192	108	117
Internal Link Dist (ft)		2661	1814	972
Turn Bay Length (ft)	275			
Base Capacity (vph)	578	3480	3413	1547
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.31	0.13	0.15

Intersection Summary



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	70	1075	0	350	90	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%		-1%		-6%	
Total Lost time (s)	7.0	6.5		6.5		7.0	
Lane Util. Factor	1.00	0.95		0.95		1.00	
Frt	1.00	1.00		0.97		0.99	
Flt Protected	0.95	1.00		1.00		0.95	
Satd. Flow (prot)	1744	3480		3414		1857	
Flt Permitted	0.37	1.00		1.00		0.95	
Satd. Flow (perm)	681	3480		3414		1857	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	1075	0	350	90	225	10
RTOR Reduction (vph)	0	0	0	19	0	50	0
Lane Group Flow (vph)	70	1075	0	421	0	185	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	0%	0%
Bus Blockages (#/hr)	0	1	0	0	0	0	0
Turn Type	pm+pt	NA	Prot	NA		NA	
Protected Phases	5	2	1	6		3	
Permitted Phases	2						
Actuated Green, G (s)	33.4	33.4		20.6		11.9	
Effective Green, g (s)	33.4	33.4		20.6		11.9	
Actuated g/C Ratio	0.57	0.57		0.35		0.20	
Clearance Time (s)	7.0	6.5		6.5		7.0	
Vehicle Extension (s)	2.5	3.0		3.0		3.0	
Lane Grp Cap (vph)	491	1976		1196		375	
v/s Ratio Prot	0.01	c0.31		0.12		c0.10	
v/s Ratio Perm	0.07						
v/c Ratio	0.14	0.54		0.35		0.49	
Uniform Delay, d1	6.2	7.9		14.2		20.8	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.1	0.3		0.2		1.0	
Delay (s)	6.3	8.2		14.3		21.8	
Level of Service	A	A		B		C	
Approach Delay (s)		8.1		14.3		21.8	
Approach LOS		A		B		C	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	20.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1125	250	70	275	137	138	175
v/c Ratio	0.54	0.31	0.19	0.11	0.56	0.57	0.46
Control Delay	20.9	3.4	25.3	13.7	44.1	44.2	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	3.4	25.3	13.7	44.1	44.2	9.4
Queue Length 50th (ft)	171	0	33	40	77	78	0
Queue Length 95th (ft)	213	43	66	92	130	131	53
Internal Link Dist (ft)	2158			451		781	
Turn Bay Length (ft)		260	190		525		500
Base Capacity (vph)	2097	798	371	2510	331	331	452
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.31	0.19	0.11	0.41	0.42	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1125	250	70	275	0	0	0	0	275	0	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			3%	
Total Lost time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5034	1567	1787	3575					1656	1656	1560
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5034	1567	1787	3575					1656	1656	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1125	250	70	275	0	0	0	0	275	0	175
RTOR Reduction (vph)	0	0	146	0	0	0	0	0	0	0	0	149
Lane Group Flow (vph)	0	1125	104	70	275	0	0	0	0	137	138	26
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		37.5	37.5	18.7	63.2					13.3	13.3	13.3
Effective Green, g (s)		37.5	37.5	18.7	63.2					13.3	13.3	13.3
Actuated g/C Ratio		0.42	0.42	0.21	0.70					0.15	0.15	0.15
Clearance Time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Vehicle Extension (s)		5.0	5.0	3.5	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2097	652	371	2510					244	244	230
v/s Ratio Prot		c0.22		c0.04	0.08					0.08	c0.08	
v/s Ratio Perm			0.07									0.02
v/c Ratio		0.54	0.16	0.19	0.11					0.56	0.57	0.11
Uniform Delay, d1		19.7	16.4	29.4	4.3					35.6	35.7	33.2
Progression Factor		1.00	1.00	0.76	2.87					1.00	1.00	1.00
Incremental Delay, d2		1.0	0.5	1.1	0.1					2.9	3.0	0.2
Delay (s)		20.7	16.9	23.6	12.5					38.6	38.7	33.5
Level of Service		C	B	C	B					D	D	C
Approach Delay (s)		20.0			14.7			0.0			36.6	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	475	900	300	250	10	30
v/c Ratio	0.59	0.30	0.16	0.27	0.07	0.23
Control Delay	34.1	0.3	14.3	3.2	38.1	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	0.3	14.3	3.2	38.1	42.4
Queue Length 50th (ft)	59	0	51	0	5	16
Queue Length 95th (ft)	52	1	87	45	21	42
Internal Link Dist (ft)		451	1741		948	
Turn Bay Length (ft)	184			280		215
Base Capacity (vph)	800	2993	1830	940	700	626
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.30	0.16	0.27	0.01	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	475	900	0	0	300	250	10	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			0%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3399	3504			3575	1599		1752	1567			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3399	3504			3575	1599		1752	1567			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	475	900	0	0	300	250	10	0	30	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	130	0	0	0	0	0	0
Lane Group Flow (vph)	475	900	0	0	300	120	0	10	30	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	5	2			6		4	4	4			
Permitted Phases						6						
Actuated Green, G (s)	21.2	71.5			43.3	43.3		5.0	5.0			
Effective Green, g (s)	21.2	71.5			43.3	43.3		5.0	5.0			
Actuated g/C Ratio	0.24	0.79			0.48	0.48		0.06	0.06			
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Vehicle Extension (s)	4.0	5.0			5.0	5.0		3.0	3.0			
Lane Grp Cap (vph)	800	2783			1719	769		97	87			
v/s Ratio Prot	c0.14	c0.26			0.08			0.01	c0.02			
v/s Ratio Perm						0.08						
v/c Ratio	0.59	0.32			0.17	0.16		0.10	0.34			
Uniform Delay, d1	30.6	2.6			13.2	13.1		40.4	40.9			
Progression Factor	1.03	0.04			1.00	1.00		1.00	1.00			
Incremental Delay, d2	1.2	0.3			0.2	0.4		0.5	2.4			
Delay (s)	32.8	0.4			13.4	13.5		40.8	43.3			
Level of Service	C	A			B	B		D	D			
Approach Delay (s)		11.6			13.5			42.7			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	20	18	106	106	10	700	300	1400	650	30
v/c Ratio	0.15	0.27	0.21	0.65	0.11	0.16	0.67	0.50	0.84	0.23	0.02
Control Delay	121.2	80.7	115.7	42.9	4.8	121.4	69.6	27.1	51.1	5.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.2	80.7	115.7	42.9	4.8	121.4	69.6	27.1	51.1	5.6	0.0
Queue Length 50th (ft)	13	13	25	17	9	13	422	119	870	87	0
Queue Length 95th (ft)	45	56	71	112	43	45	661	283	1094	175	0
Internal Link Dist (ft)		1005		682			1789			2364	
Turn Bay Length (ft)	170		310			390		390	470		495
Base Capacity (vph)	65	73	173	235	1196	64	1345	716	2360	3196	1436
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.27	0.10	0.45	0.09	0.16	0.52	0.42	0.59	0.20	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	20	10	200	10	700	300	1400	650	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.93		1.00	0.87	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1740		1732	1513	1550	1752	3504	1567	3399	3504	1567
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1740		1732	1513	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	10	10	20	10	200	10	700	300	1400	650	30
RTOR Reduction (vph)	0	10	0	0	90	44	0	0	128	0	0	6
Lane Group Flow (vph)	10	10	0	18	16	62	10	700	172	1400	650	24
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	5.2	5.2		9.9	9.9	110.2	2.2	66.7	66.7	100.3	164.8	164.8
Effective Green, g (s)	5.2	5.2		9.9	9.9	110.2	2.2	66.7	66.7	100.3	164.8	164.8
Actuated g/C Ratio	0.02	0.02		0.05	0.05	0.52	0.01	0.32	0.32	0.48	0.78	0.78
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	44	43		81	71	864	18	1112	497	1622	2748	1229
v/s Ratio Prot	0.01	c0.01		0.01	c0.01	0.03	0.01	c0.20		c0.41	0.19	
v/s Ratio Perm						0.01			0.11			0.02
v/c Ratio	0.23	0.24		0.22	0.23	0.07	0.56	0.63	0.35	0.86	0.24	0.02
Uniform Delay, d1	100.5	100.5		96.4	96.4	24.7	103.5	61.2	55.0	48.8	6.0	5.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	2.9		1.4	1.7	0.0	32.3	1.6	0.9	5.2	0.1	0.0
Delay (s)	103.1	103.4		97.8	98.1	24.7	135.8	62.8	55.9	54.0	6.1	5.0
Level of Service	F	F		F	F	C	F	E	E	D	A	A
Approach Delay (s)		103.3			64.3			61.4			38.3	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	210.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	125	2285	10	600	275	10	100	70
v/c Ratio	0.70	0.60	0.12	0.19	0.25	0.02	0.61	0.22
Control Delay	87.2	7.3	72.0	13.5	2.5	0.1	80.4	1.7
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.2	7.6	72.0	13.5	2.5	0.1	80.4	1.7
Queue Length 50th (ft)	127	73	10	77	0	0	96	0
Queue Length 95th (ft)	m159	492	31	140	46	0	156	0
Internal Link Dist (ft)		452		967		434	639	
Turn Bay Length (ft)	250		255		360			175
Base Capacity (vph)	214	3792	82	3200	1098	703	436	527
Starvation Cap Reductn	0	806	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.77	0.12	0.19	0.25	0.01	0.23	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	2275	10	10	600	275	0	0	10	100	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			0%			0%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.95	1.00
Satd. Flow (prot)	1787	5133		1770	5085	1583		1611			1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.95	1.00
Satd. Flow (perm)	1787	5133		1770	5085	1583		1611			1770	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	2275	10	10	600	275	0	0	10	100	0	70
RTOR Reduction (vph)	0	0	0	0	0	110	0	10	0	0	0	64
Lane Group Flow (vph)	125	2285	0	10	600	165	0	0	0	0	100	6
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases						2						3
Actuated Green, G (s)	15.1	102.5		2.8	90.2	90.2		2.8			13.9	13.9
Effective Green, g (s)	15.1	102.5		2.8	90.2	90.2		2.8			13.9	13.9
Actuated g/C Ratio	0.10	0.68		0.02	0.60	0.60		0.02			0.09	0.09
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0			3.0	3.0
Lane Grp Cap (vph)	179	3507		33	3057	951		30			164	146
v/s Ratio Prot	c0.07	c0.45		0.01	0.12			c0.00			c0.06	
v/s Ratio Perm						0.10						0.00
v/c Ratio	0.70	0.65		0.30	0.20	0.17		0.01			0.61	0.04
Uniform Delay, d1	65.2	13.6		72.6	13.5	13.3		72.2			65.4	62.0
Progression Factor	1.08	0.54		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	9.6	0.8		5.1	0.1	0.4		0.1			6.3	0.1
Delay (s)	79.9	8.1		77.8	13.7	13.7		72.3			71.7	62.1
Level of Service	E	A		E	B	B		E			E	E
Approach Delay (s)		11.9			14.4			72.3			67.8	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	975	1375	40	30	775	575	10	30	126	129	70
v/c Ratio	0.76	0.66	0.06	0.09	0.69	0.79	0.07	0.21	0.47	0.48	0.19
Control Delay	47.0	36.9	0.1	53.2	49.2	33.6	70.4	54.7	64.5	64.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	9.9	8.8	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	36.9	0.1	53.2	59.1	42.4	70.4	54.7	64.5	64.5	1.1
Queue Length 50th (ft)	435	413	0	25	265	294	10	19	123	126	0
Queue Length 95th (ft)	599	433	0	73	354	527	32	58	200	204	0
Internal Link Dist (ft)		967			196			671		824	
Turn Bay Length (ft)	500		200						430		430
Base Capacity (vph)	1353	2843	930	331	1131	724	435	442	524	532	594
Starvation Cap Reductn	0	0	0	0	328	120	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.48	0.04	0.09	0.97	0.95	0.02	0.07	0.24	0.24	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	975	1375	40	30	775	575	10	20	10	225	30	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			0%			-3%	
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3467	5136	1599	1752	5034	1567	1770	1770		1706	1730	1607
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3467	5136	1599	1752	5034	1567	1770	1770		1706	1730	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	975	1375	40	30	775	575	10	20	10	225	30	70
RTOR Reduction (vph)	0	0	24	0	0	373	0	9	0	0	0	59
Lane Group Flow (vph)	975	1375	16	30	775	202	10	21	0	126	129	11
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		8	8		3	3	
Permitted Phases			6			2						3
Actuated Green, G (s)	55.4	60.7	60.7	28.1	33.4	33.4	8.9	8.9		23.3	23.3	23.3
Effective Green, g (s)	55.4	60.7	60.7	28.1	33.4	33.4	8.9	8.9		23.3	23.3	23.3
Actuated g/C Ratio	0.37	0.40	0.40	0.19	0.22	0.22	0.06	0.06		0.16	0.16	0.16
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.5	3.0	3.0	3.0	3.0	3.0	4.0	4.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1280	2078	647	328	1120	348	105	105		264	268	249
v/s Ratio Prot	c0.28	0.27		0.02	c0.15		0.01	c0.01		0.07	c0.07	
v/s Ratio Perm			0.01			0.13						0.01
v/c Ratio	0.76	0.66	0.03	0.09	0.69	0.58	0.10	0.20		0.48	0.48	0.04
Uniform Delay, d1	41.5	36.3	26.9	50.4	53.6	52.0	66.7	67.1		57.8	57.8	53.9
Progression Factor	1.00	1.00	1.00	0.82	0.83	2.33	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.8	0.8	0.0	0.1	1.9	2.4	0.5	1.3		1.4	1.4	0.1
Delay (s)	44.3	37.1	26.9	41.6	46.2	123.8	67.3	68.4		59.2	59.2	53.9
Level of Service	D	D	C	D	D	F	E	E		E	E	D
Approach Delay (s)		39.9			78.4			68.1			58.1	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	1175	10	2350	10	500	325
v/c Ratio	0.95	0.02	0.86	0.23	0.17	0.31
Control Delay	77.0	1.4	24.0	89.6	39.1	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	1.4	24.0	89.6	39.1	22.2
Queue Length 50th (ft)	764	0	849	14	180	172
Queue Length 95th (ft)	865	3	1085	m41	204	249
Internal Link Dist (ft)	1564		126		1018	
Turn Bay Length (ft)				315		
Base Capacity (vph)	1278	609	2741	44	2863	1033
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.02	0.86	0.23	0.17	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	1175	10	0	2350	10	500	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0		7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00		0.91	1.00	0.91	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583		5085	1770	5085	1583
Flt Permitted	0.95	1.00		1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583		5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1175	10	0	2350	10	500	325
RTOR Reduction (vph)	0	6	0	0	0	0	142
Lane Group Flow (vph)	1175	4	0	2350	10	500	183
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	72.4	72.4		103.6	2.0	112.6	112.6
Effective Green, g (s)	72.4	72.4		103.6	2.0	112.6	112.6
Actuated g/C Ratio	0.36	0.36		0.52	0.01	0.56	0.56
Clearance Time (s)	7.5	7.0		7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0		4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	1242	573		2634	17	2862	891
v/s Ratio Prot	c0.34			c0.46	0.01	0.10	
v/s Ratio Perm		0.00					c0.12
v/c Ratio	0.95	0.01		0.89	0.59	0.17	0.21
Uniform Delay, d1	61.9	40.8		43.2	98.6	21.2	21.6
Progression Factor	1.00	1.00		0.52	0.81	1.81	11.80
Incremental Delay, d2	14.4	0.0		3.6	42.7	0.1	0.5
Delay (s)	76.3	40.8		26.0	122.6	38.6	255.3
Level of Service	E	D		C	F	D	F
Approach Delay (s)	76.0			26.0		123.9	
Approach LOS	E			C		F	

Intersection Summary			
HCM 2000 Control Delay	58.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	109	3723	734	136	222	224	98
v/c Ratio	0.55	0.94	0.17	0.10	0.83	0.67	0.22
Control Delay	101.3	26.2	4.6	0.1	104.8	56.0	8.8
Queue Delay	0.0	44.6	0.0	0.0	0.4	0.4	0.0
Total Delay	101.3	70.8	4.6	0.1	105.2	56.4	8.8
Queue Length 50th (ft)	73	1377	31	0	303	187	0
Queue Length 95th (ft)	110	#1885	41	0	394	286	51
Internal Link Dist (ft)		1701	1154			995	
Turn Bay Length (ft)	575				435		
Base Capacity (vph)	214	3941	4383	1404	378	431	457
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	755	0	0	20	33	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.17	0.17	0.10	0.62	0.56	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	100	3425	0	0	0	675	125	0	0	0	400	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Lane Util. Factor	0.97	0.91				0.86	1.00				0.95	0.91
Frt	1.00	1.00				1.00	0.85				1.00	0.99
Flt Protected	0.95	1.00				1.00	1.00				0.95	0.95
Satd. Flow (prot)	3433	5085				6408	1583				1681	1606
Flt Permitted	0.95	1.00				1.00	1.00				0.95	0.95
Satd. Flow (perm)	3433	5085				6408	1583				1681	1606
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	3723	0	0	0	734	136	0	0	0	435	0
RTOR Reduction (vph)	0	0	0	0	0	0	21	0	0	0	0	76
Lane Group Flow (vph)	109	3723	0	0	0	734	115	0	0	0	222	148
Turn Type	Prot	NA		custom		NA	pm+ov	Split			Split	NA
Protected Phases	1	6				2	4	3	3		4	4
Permitted Phases				5			2					
Actuated Green, G (s)	11.7	155.0				136.8	168.8				32.0	32.0
Effective Green, g (s)	11.7	155.0				136.8	168.8				32.0	32.0
Actuated g/C Ratio	0.06	0.78				0.68	0.84				0.16	0.16
Clearance Time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Vehicle Extension (s)	3.0	4.0				4.0	3.0				3.0	3.0
Lane Grp Cap (vph)	200	3940				4383	1387				268	256
v/s Ratio Prot	0.03	c0.73				0.11	0.01				c0.13	0.09
v/s Ratio Perm							0.06					
v/c Ratio	0.55	0.94				0.17	0.08				0.83	0.58
Uniform Delay, d1	91.6	18.9				11.3	2.6				81.3	77.8
Progression Factor	1.00	1.00				0.37	0.00				1.00	1.00
Incremental Delay, d2	3.0	6.3				0.1	0.0				18.6	3.2
Delay (s)	94.6	25.2				4.3	0.0				99.9	80.9
Level of Service	F	C				A	A				F	F
Approach Delay (s)		27.1				3.6			0.0			85.3
Approach LOS		C				A			A			F

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	100
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	0.95
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1504
Flt Permitted	1.00
Satd. Flow (perm)	1504
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	109
RTOR Reduction (vph)	77
Lane Group Flow (vph)	21
Turn Type	pm+ov
Protected Phases	1
Permitted Phases	4
Actuated Green, G (s)	43.7
Effective Green, g (s)	43.7
Actuated g/C Ratio	0.22
Clearance Time (s)	6.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	377
v/s Ratio Prot	0.00
v/s Ratio Perm	0.01
v/c Ratio	0.06
Uniform Delay, d1	61.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	61.9
Level of Service	E
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1087	3353	11	598	109	43	163	217	43	22	245
v/c Ratio	0.67	0.92	0.18	0.27	0.16	0.20	0.73	0.70	0.25	0.24	0.09
Control Delay	54.5	35.6	117.1	47.8	5.2	79.4	102.8	42.7	95.2	97.8	0.1
Queue Delay	0.0	35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	70.6	117.1	47.8	5.2	79.4	102.8	42.7	95.2	97.8	0.1
Queue Length 50th (ft)	401	1556	14	170	0	52	211	104	28	28	0
Queue Length 95th (ft)	m438	#1838	43	192	41	94	291	202	54	66	0
Internal Link Dist (ft)		1154		740			701			434	
Turn Bay Length (ft)	800		415		350	195		195	240		300
Base Capacity (vph)	1621	3629	61	2222	678	380	400	447	171	93	2787
Starvation Cap Reductn	0	514	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	1.08	0.18	0.27	0.16	0.11	0.41	0.49	0.25	0.24	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1000	3075	10	10	550	100	40	150	200	40	20	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.94	0.91		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	5083		1770	6408	1583	1770	1863	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	5083		1770	6408	1583	1770	1863	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1087	3342	11	11	598	109	43	163	217	43	22	245
RTOR Reduction (vph)	0	0	0	0	0	70	0	0	120	0	0	0
Lane Group Flow (vph)	1087	3353	0	11	598	39	43	163	97	43	22	245
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Free
Protected Phases	1 3	3 6!		5!	2	8	7	7		8	8	
Permitted Phases						2			7			Free
Actuated Green, G (s)	69.2	137.2		2.8	63.8	71.8	24.0	24.0	24.0	8.0	8.0	200.0
Effective Green, g (s)	69.2	137.2		2.8	63.8	71.8	24.0	24.0	24.0	8.0	8.0	200.0
Actuated g/C Ratio	0.35	0.69		0.01	0.32	0.36	0.12	0.12	0.12	0.04	0.04	1.00
Clearance Time (s)				7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)				3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	1726	3486		24	2044	568	212	223	189	137	74	2787
v/s Ratio Prot	c0.22	c0.66		0.01	0.09	0.00	0.02	c0.09		c0.01	0.01	
v/s Ratio Perm						0.02			0.06			0.09
v/c Ratio	0.63	0.96		0.46	0.29	0.07	0.20	0.73	0.51	0.31	0.30	0.09
Uniform Delay, d1	54.7	29.0		97.8	51.1	42.1	79.4	84.9	82.5	93.3	93.3	0.0
Progression Factor	1.18	1.30		1.18	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	4.8		13.1	0.4	0.1	0.6	12.4	3.1	1.8	3.1	0.1
Delay (s)	64.9	42.4		128.2	50.2	41.9	80.0	97.3	85.7	95.1	96.3	0.1
Level of Service	E	D		F	D	D	F	F	F	F	F	A
Approach Delay (s)		47.9			50.1			89.6			20.1	
Approach LOS		D			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	35.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	435	2582	707	788	571	22
v/c Ratio	0.81	0.68	0.25	0.37	0.64	0.02
Control Delay	85.6	13.2	8.6	5.9	71.9	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.6	13.2	8.6	5.9	71.9	32.5
Queue Length 50th (ft)	260	556	125	226	221	9
Queue Length 95th (ft)	312	604	57	64	265	19
Internal Link Dist (ft)		3908	1326		784	
Turn Bay Length (ft)	600			800		550
Base Capacity (vph)	743	3796	2804	2187	970	1014
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.68	0.25	0.36	0.59	0.02

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	400	2375	650	725	525	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	0.97	0.91	0.91	0.88	0.94	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	5085	5085	2787	4990	2787
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	5085	5085	2787	4990	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	2582	707	788	571	22
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	435	2582	707	788	571	22
Turn Type	Prot	NA	NA	pt+ov	NA	pm+ov
Protected Phases	1	6	2	2 4	4	1
Permitted Phases						4
Actuated Green, G (s)	28.1	134.4	99.3	137.9	32.1	60.2
Effective Green, g (s)	28.1	134.4	99.3	137.9	32.1	60.2
Actuated g/C Ratio	0.16	0.75	0.55	0.77	0.18	0.33
Clearance Time (s)	7.0	6.5	6.5		7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0		3.5	3.0
Lane Grp Cap (vph)	535	3796	2805	2135	889	1040
v/s Ratio Prot	c0.13	c0.51	0.14	0.28	c0.11	0.00
v/s Ratio Perm						0.00
v/c Ratio	0.81	0.68	0.25	0.37	0.64	0.02
Uniform Delay, d1	73.4	11.7	21.0	6.9	68.6	40.2
Progression Factor	1.00	1.00	0.38	0.77	1.00	1.00
Incremental Delay, d2	9.2	1.0	0.2	0.1	1.7	0.0
Delay (s)	82.6	12.7	8.2	5.4	70.3	40.2
Level of Service	F	B	A	A	E	D
Approach Delay (s)		22.8	6.7		69.2	
Approach LOS		C	A		E	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	2310	978	109	1304	43	106	52	109	76	11
v/c Ratio	0.16	0.77	0.60	0.68	0.37	0.04	0.48	0.45	0.66	0.44	0.04
Control Delay	100.3	29.1	23.4	99.0	6.4	1.3	87.1	82.5	95.8	82.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.3	29.1	23.4	99.0	6.4	1.3	87.1	82.5	95.8	82.4	0.3
Queue Length 50th (ft)	13	831	424	129	172	0	67	58	126	86	0
Queue Length 95th (ft)	m21	973	616	206	269	13	103	113	193	141	0
Internal Link Dist (ft)		1326			2726			1066		653	
Turn Bay Length (ft)	345			225		500	1000				125
Base Capacity (vph)	69	2994	1641	178	3485	1116	223	116	292	307	384
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.77	0.60	0.61	0.37	0.04	0.48	0.45	0.37	0.25	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	2125	900	100	1200	40	125	10	10	100	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.88	1.00	0.91	1.00	0.91	0.91		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	2787	1770	5085	1583	3221	1595		1593	1676	1478
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	2787	1770	5085	1583	3221	1595		1593	1676	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	2310	978	109	1304	43	136	11	11	109	76	11
RTOR Reduction (vph)	0	0	0	0	0	14	0	6	0	0	0	10
Lane Group Flow (vph)	11	2310	978	109	1304	29	106	46	0	109	76	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6						3
Actuated Green, G (s)	2.9	106.0	106.0	16.3	119.4	119.4	12.5	12.5		18.7	18.7	18.7
Effective Green, g (s)	2.9	106.0	106.0	16.3	119.4	119.4	12.5	12.5		18.7	18.7	18.7
Actuated g/C Ratio	0.02	0.59	0.59	0.09	0.66	0.66	0.07	0.07		0.10	0.10	0.10
Clearance Time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	28	2994	1641	160	3373	1050	223	110		165	174	153
v/s Ratio Prot	0.01	c0.45		c0.06	0.26		c0.03	0.03		c0.07	0.05	
v/s Ratio Perm			0.35			0.02						0.00
v/c Ratio	0.39	0.77	0.60	0.68	0.39	0.03	0.48	0.42		0.66	0.44	0.01
Uniform Delay, d1	87.7	27.9	23.4	79.3	13.7	10.4	80.6	80.3		77.6	75.7	72.3
Progression Factor	1.15	0.93	0.88	0.99	0.46	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.3	1.5	1.2	11.9	0.3	0.0	2.2	3.5		10.4	2.4	0.0
Delay (s)	109.9	27.4	21.8	90.8	6.6	10.4	82.8	83.8		88.0	78.1	72.4
Level of Service	F	C	C	F	A	B	F	F		F	E	E
Approach Delay (s)		26.0			13.0			83.1			83.3	
Approach LOS		C			B			F			F	

Intersection Summary				
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.5	
Intersection Capacity Utilization	75.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	NWL	NWT
Lane Group Flow (vph)	190	1766	543	299	1141	870	245	54	65	131
v/c Ratio	0.68	0.57	0.46	0.77	0.35	0.71	0.75	0.35	0.19	0.70
Control Delay	127.5	7.0	2.5	88.4	12.8	14.2	83.8	32.2	64.7	39.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	127.5	7.0	2.5	88.4	12.8	14.5	83.8	32.2	64.7	39.6
Queue Length 50th (ft)	120	310	53	185	144	210	137	12	34	26
Queue Length 95th (ft)	m157	277	59	226	203	301	177	60	57	101
Internal Link Dist (ft)		620			1066			310		883
Turn Bay Length (ft)	410		500	410		1000	200		200	
Base Capacity (vph)	309	3090	1174	440	3253	1231	328	171	458	244
Starvation Cap Reductn	0	0	0	0	0	68	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.57	0.46	0.68	0.35	0.75	0.75	0.32	0.14	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	175	1625	500	275	1050	800	225	10	40	60	20	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1640		3433	1630	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.35	1.00		0.72	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1279	1640		2608	1630	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	190	1766	543	299	1141	870	245	11	43	65	22	109
RTOR Reduction (vph)	0	0	217	0	0	224	0	40	0	0	103	0
Lane Group Flow (vph)	190	1766	326	299	1141	646	245	14	0	65	28	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	14.7	108.0	108.0	20.4	113.7	113.7	24.3	11.3		22.9	10.6	
Effective Green, g (s)	14.7	108.0	108.0	20.4	113.7	113.7	24.3	11.3		22.9	10.6	
Actuated g/C Ratio	0.08	0.60	0.60	0.11	0.63	0.63	0.14	0.06		0.13	0.06	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	280	3051	949	389	3212	999	328	102		388	95	
v/s Ratio Prot	0.06	0.35		c0.09	0.22		c0.05	0.01		0.01	0.02	
v/s Ratio Perm			0.21			c0.41	c0.05			0.01		
v/c Ratio	0.68	0.58	0.34	0.77	0.36	0.65	0.75	0.13		0.17	0.30	
Uniform Delay, d1	80.4	22.1	18.1	77.5	15.7	20.7	72.7	79.7		69.9	81.1	
Progression Factor	1.48	0.29	1.23	0.98	0.80	1.85	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.5	0.6	8.4	0.3	3.1	9.0	0.6		0.2	1.8	
Delay (s)	123.4	7.0	22.9	84.2	12.9	41.3	81.6	80.3		70.1	82.9	
Level of Service	F	A	C	F	B	D	F	F		E	F	
Approach Delay (s)		19.3			32.8			81.4			78.7	
Approach LOS		B			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT
Lane Group Flow (vph)	11	1957	2255
v/c Ratio	0.15	0.38	0.48
Control Delay	83.8	0.2	1.5
Queue Delay	0.0	0.0	0.0
Total Delay	83.8	0.2	1.5
Queue Length 50th (ft)	13	0	43
Queue Length 95th (ft)	m24	0	9
Internal Link Dist (ft)		1066	1427
Turn Bay Length (ft)	550		
Base Capacity (vph)	89	5162	4746
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.12	0.38	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	1800	2075	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		-3%	4%		0%	
Total Lost time (s)	7.0	6.5	6.5			
Lane Util. Factor	1.00	0.91	0.91			
Frt	1.00	1.00	1.00			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1796	5162	4984			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	1796	5162	4984			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1957	2255	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	11	1957	2255	0	0	0
Turn Type	Prot	NA	NA	Perm		Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	3.2	180.0	163.3			
Effective Green, g (s)	3.2	180.0	163.3			
Actuated g/C Ratio	0.02	1.00	0.91			
Clearance Time (s)	7.0	6.5	6.5			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	31	5162	4521			
v/s Ratio Prot	0.01	c0.38	c0.45			
v/s Ratio Perm						
v/c Ratio	0.35	0.38	0.50			
Uniform Delay, d1	87.4	0.0	1.4			
Progression Factor	0.96	1.00	1.11			
Incremental Delay, d2	5.6	0.2	0.3			
Delay (s)	89.8	0.2	1.8			
Level of Service	F	A	A			
Approach Delay (s)		0.7	1.8		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

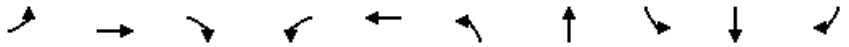
c Critical Lane Group

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	325	300	925	300	575
v/c Ratio	0.82	0.41	0.52	0.65	0.23
Control Delay	71.3	1.7	25.4	16.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	1.7	25.4	16.9	9.3
Queue Length 50th (ft)	305	0	277	100	99
Queue Length 95th (ft)	387	0	448	180	156
Internal Link Dist (ft)		481	906		768
Turn Bay Length (ft)				250	
Base Capacity (vph)	481	778	1763	565	2460
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.39	0.52	0.53	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	325	0	300	0	575	350	300	575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor				1.00	1.00			0.95		1.00	0.95	
Frt				1.00	0.85			0.94		1.00	1.00	
Flt Protected				0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)				1770	1583			3338		1770	3539	
Flt Permitted				0.95	1.00			1.00		0.21	1.00	
Satd. Flow (perm)				1770	1583			3338		389	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	325	0	300	0	575	350	300	575	0
RTOR Reduction (vph)	0	0	0	0	233	0	0	45	0	0	0	0
Lane Group Flow (vph)	0	0	0	325	67	0	0	880	0	300	575	0
Turn Type	Split			Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)				33.7	33.7			77.3		104.3	104.3	
Effective Green, g (s)				33.7	33.7			77.3		104.3	104.3	
Actuated g/C Ratio				0.22	0.22			0.52		0.70	0.70	
Clearance Time (s)				6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)				397	355			1720		463	2460	
v/s Ratio Prot				c0.18	0.04			0.26		c0.09	0.16	
v/s Ratio Perm										c0.36		
v/c Ratio				0.82	0.19			0.51		0.65	0.23	
Uniform Delay, d1				55.2	47.1			23.9		13.4	8.3	
Progression Factor				1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2				12.4	0.3			1.1		3.1	0.2	
Delay (s)				67.6	47.4			25.0		16.6	8.5	
Level of Service				E	D			C		B	A	
Approach Delay (s)		0.0			57.9			25.0			11.3	
Approach LOS		A			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	109	1359	489	87	1582	380	305	65	408	299
v/c Ratio	0.59	0.97	0.54	0.99	0.92	0.66	1.00	0.09	1.01	0.58
Control Delay	76.0	55.3	7.2	173.7	66.9	76.6	124.1	56.8	115.6	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.0	55.3	7.2	173.7	66.9	76.6	124.1	56.8	115.6	21.9
Queue Length 50th (ft)	111	355	17	105	660	220	366	31	~497	81
Queue Length 95th (ft)	184	#966	149	#234	727	281	#580	56	#732	191
Internal Link Dist (ft)		937			1943		2110		622	
Turn Bay Length (ft)	485		510	610		160		250		300
Base Capacity (vph)	186	1395	913	88	1713	572	305	743	403	514
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.97	0.54	0.99	0.92	0.66	1.00	0.09	1.01	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1250	450	80	1375	80	350	250	30	60	375	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.97	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	5043		3433	1833		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	5043		3433	1833		3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1359	489	87	1495	87	380	272	33	65	408	299
RTOR Reduction (vph)	0	0	289	0	3	0	0	0	0	0	0	172
Lane Group Flow (vph)	109	1359	200	87	1579	0	380	305	0	65	408	127
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	7		3	3		6	6	
Permitted Phases			2									6
Actuated Green, G (s)	19.0	71.0	71.0	9.0	61.0		30.0	30.0		39.0	39.0	39.0
Effective Green, g (s)	19.0	71.0	71.0	9.0	61.0		30.0	30.0		39.0	39.0	39.0
Actuated g/C Ratio	0.11	0.39	0.39	0.05	0.34		0.17	0.17		0.22	0.22	0.22
Clearance Time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	186	1395	624	88	1709		572	305		743	403	342
v/s Ratio Prot	0.06	c0.38		0.05	c0.31		0.11	c0.17		0.02	c0.22	
v/s Ratio Perm			0.13									0.08
v/c Ratio	0.59	0.97	0.32	0.99	0.92		0.66	1.00		0.09	1.01	0.37
Uniform Delay, d1	76.8	53.6	37.8	85.4	57.3		70.3	75.0		56.3	70.5	60.1
Progression Factor	0.82	0.69	1.56	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	18.0	1.3	91.3	9.9		2.9	51.5		0.1	48.0	0.7
Delay (s)	67.6	55.2	60.3	176.8	67.2		73.2	126.5		56.3	118.5	60.8
Level of Service	E	E	E	F	E		E	F		E	F	E
Approach Delay (s)		57.1			72.9			96.9			90.9	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	72.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	125	375	675	525	175
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	50	125	375	675	525	175
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1950	525	525			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1950	525	525			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	77	64			
cM capacity (veh/h)	45	552	1042			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	175	375	675	525	175
Volume Left	50	375	0	0	0
Volume Right	125	0	0	0	175
cSH	132	1042	1700	1700	1700
Volume to Capacity	1.33	0.36	0.40	0.31	0.10
Queue Length 95th (ft)	282	41	0	0	0
Control Delay (s)	254.8	10.4	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	254.8	3.7		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	25.2			
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	30	1225	50	200	3600	80	20	10	125	125	10	80
v/c Ratio	0.75	0.39	0.05	0.84	0.91	0.06	0.12	0.05	0.42	0.79	0.05	0.27
Control Delay	180.0	22.4	19.3	98.1	25.2	2.8	85.2	82.4	15.1	125.9	82.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.0	22.4	19.3	98.1	25.2	2.8	85.2	82.4	15.1	125.9	82.4	2.6
Queue Length 50th (ft)	44	316	28	227	1437	7	27	13	0	180	13	0
Queue Length 95th (ft)	#117	427	61	275	1724	28	58	35	70	257	35	3
Internal Link Dist (ft)		1472			1818			850			1101	
Turn Bay Length (ft)	520		380	380		400	55		65	270		280
Base Capacity (vph)	40	3161	980	305	3944	1236	248	330	383	239	330	382
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.39	0.05	0.66	0.91	0.06	0.08	0.03	0.33	0.52	0.03	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1225	50	200	3600	80	20	10	125	125	10	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1577	1770	5085	1577	1770	1863	1583	1711	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1770	5085	1577	1770	5085	1577	1399	1863	1583	1352	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	1225	50	200	3600	80	20	10	125	125	10	80
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	110	0	0	71
Lane Group Flow (vph)	30	1225	50	200	3600	67	20	10	15	125	10	9
Bus Blockages (#/hr)	0	0	1	0	0	1	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1 3	6			4			8	
Permitted Phases			2			6	4		4	8		8
Actuated Green, G (s)	4.0	135.4	135.4	30.9	169.3	169.3	25.7	25.7	25.7	25.7	25.7	25.7
Effective Green, g (s)	4.0	135.4	135.4	30.9	169.3	169.3	25.7	25.7	25.7	25.7	25.7	25.7
Actuated g/C Ratio	0.02	0.62	0.62	0.14	0.77	0.77	0.12	0.12	0.12	0.12	0.12	0.12
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0		4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	32	3129	970	248	3913	1213	163	217	184	157	217	184
v/s Ratio Prot	0.02	0.24		c0.11	c0.71			0.01			0.01	
v/s Ratio Perm			0.03			0.04	0.01		0.01	c0.09		0.01
v/c Ratio	0.94	0.39	0.05	0.81	0.92	0.06	0.12	0.05	0.08	0.80	0.05	0.05
Uniform Delay, d1	107.9	21.4	16.8	91.7	20.0	6.1	87.0	86.3	86.6	94.6	86.3	86.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.6	0.4	0.1	16.3	4.7	0.1	0.3	0.1	0.2	23.7	0.1	0.1
Delay (s)	238.5	21.8	16.9	108.0	24.7	6.2	87.4	86.4	86.8	118.3	86.4	86.4
Level of Service	F	C	B	F	C	A	F	F	F	F	F	F
Approach Delay (s)		26.6			28.6			86.8			105.0	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	312	313	40	225	1125	675	425
v/c Ratio	0.75	0.75	0.06	0.45	0.48	0.36	0.31
Control Delay	69.4	69.5	0.5	19.0	20.5	17.6	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.4	69.5	0.5	19.0	20.5	17.6	0.7
Queue Length 50th (ft)	341	342	0	96	335	125	4
Queue Length 95th (ft)	413	414	3	177	533	327	2
Internal Link Dist (ft)		655			1415	1227	
Turn Bay Length (ft)	515		320	330			260
Base Capacity (vph)	554	554	741	577	2358	1895	1473
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.56	0.05	0.39	0.48	0.36	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	625	0	40	0	0	0	225	1125	0	0	675	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0				7.0	7.5			7.5	7.0
Lane Util. Factor	0.95	0.95	1.00				1.00	0.95			0.95	1.00
Frt	1.00	1.00	0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1681	1583				1770	3539			3539	1583
Flt Permitted	0.95	0.95	1.00				0.32	1.00			1.00	1.00
Satd. Flow (perm)	1681	1681	1583				594	3539			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	625	0	40	0	0	0	225	1125	0	0	675	425
RTOR Reduction (vph)	0	0	25	0	0	0	0	0	0	0	0	92
Lane Group Flow (vph)	312	313	15	0	0	0	225	1125	0	0	675	333
Turn Type	Split	NA	pt+ov	Split			pm+pt	NA		Perm	NA	pm+ov
Protected Phases	4	4	4 5	3	3		5	2			6	4
Permitted Phases							2			6		6
Actuated Green, G (s)	42.2	42.2	64.5				113.3	113.3			91.0	133.2
Effective Green, g (s)	42.2	42.2	64.5				113.3	113.3			91.0	133.2
Actuated g/C Ratio	0.25	0.25	0.38				0.67	0.67			0.54	0.78
Clearance Time (s)	7.0	7.0					7.0	7.5			7.5	7.0
Vehicle Extension (s)	5.0	5.0					4.0	4.0			4.0	5.0
Lane Grp Cap (vph)	417	417	600				501	2358			1894	1240
v/s Ratio Prot	0.19	c0.19	0.01				0.04	c0.32			0.19	0.07
v/s Ratio Perm							0.26					0.14
v/c Ratio	0.75	0.75	0.03				0.45	0.48			0.36	0.27
Uniform Delay, d1	59.0	59.0	33.1				12.4	13.9			22.7	5.0
Progression Factor	1.00	1.00	1.00				1.33	1.30			0.69	0.70
Incremental Delay, d2	8.6	8.8	0.0				0.8	0.7			0.5	0.2
Delay (s)	67.6	67.8	33.1				17.2	18.7			16.0	3.8
Level of Service	E	E	C				B	B			B	A
Approach Delay (s)		65.6			0.0			18.5			11.3	
Approach LOS		E			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	104	106	350	50	20	40	1650	10	850	925
v/c Ratio	0.44	0.44	0.73	0.52	0.11	0.09	0.69	0.06	0.38	0.58
Control Delay	72.0	72.2	36.9	96.7	1.3	6.2	16.5	4.5	6.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	72.0	72.2	36.9	96.7	1.3	6.2	16.5	4.5	6.8	1.0
Queue Length 50th (ft)	113	115	176	55	0	7	467	1	138	0
Queue Length 95th (ft)	176	180	286	106	0	12	698	m1	165	0
Internal Link Dist (ft)		625		38			1227		378	
Turn Bay Length (ft)	400		540			510		150		
Base Capacity (vph)	309	311	492	106	184	426	2385	170	2219	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	824	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.34	0.71	0.47	0.11	0.09	0.69	0.06	0.61	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	10	350	30	20	20	40	1650	0	10	850	925
Ideal Flow (vphpl)	2050	2050	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1814	1827	1583		1808	1583	1770	3539		1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.97	1.00	0.27	1.00		0.08	1.00	1.00
Satd. Flow (perm)	1814	1827	1583		1808	1583	505	3539		158	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	10	350	30	20	20	40	1650	0	10	850	925
RTOR Reduction (vph)	0	0	149	0	0	19	0	0	0	0	0	0
Lane Group Flow (vph)	104	106	201	0	50	1	40	1650	0	10	850	925
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt	NA		pm+pt	NA	Free
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2			6		Free
Actuated Green, G (s)	22.5	22.5	30.5		7.7	10.5	117.0	109.0		106.6	103.8	170.0
Effective Green, g (s)	22.5	22.5	30.5		7.7	10.5	117.0	109.0		106.6	103.8	170.0
Actuated g/C Ratio	0.13	0.13	0.18		0.05	0.06	0.69	0.64		0.63	0.61	1.00
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	240	241	349		81	97	407	2269		125	2160	1583
v/s Ratio Prot	0.06	0.06	0.03		0.03	0.00	0.00	c0.47		0.00	0.24	
v/s Ratio Perm			0.10			0.00	0.06			0.05		c0.58
v/c Ratio	0.43	0.44	0.57		0.62	0.01	0.10	0.73		0.08	0.39	0.58
Uniform Delay, d1	67.9	67.9	63.8		79.7	74.9	9.7	20.5		18.0	17.0	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.58	0.72		0.39	0.33	1.00
Incremental Delay, d2	1.3	1.3	2.3		13.2	0.1	0.1	1.8		0.2	0.3	1.0
Delay (s)	69.1	69.2	66.1		92.9	74.9	5.7	16.7		7.1	6.0	1.0
Level of Service	E	E	E		F	E	A	B		A	A	A
Approach Delay (s)		67.3			87.8			16.4			3.4	
Approach LOS		E			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Group Flow (vph)	1275	725	900	2100	975
v/c Ratio	1.16	1.06	1.58	0.71	1.62
Control Delay	141.1	76.6	307.3	28.3	319.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	141.1	76.6	307.3	28.3	319.3
Queue Length 50th (ft)	~648	~510	~1503	627	~1591
Queue Length 95th (ft)	#746	#772	#1770	676	#1863
Internal Link Dist (ft)	837			1008	920
Turn Bay Length (ft)			425		
Base Capacity (vph)	1101	684	570	2966	603
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.16	1.06	1.58	0.71	1.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑↑						✣	
Volume (vph)	0	1275	725	900	2100	0	0	0	0	225	0	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0	8.0	8.0						7.0	
Lane Util. Factor		0.91	1.00	1.00	0.91						1.00	
Frt		1.00	0.85	1.00	1.00						0.90	
Flt Protected		1.00	1.00	0.95	1.00						0.99	
Satd. Flow (prot)		5085	1583	1770	5085						1650	
Flt Permitted		1.00	1.00	0.95	1.00						0.99	
Satd. Flow (perm)		5085	1583	1770	5085						1650	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1275	725	900	2100	0	0	0	0	225	0	750
RTOR Reduction (vph)	0	0	342	0	0	0	0	0	0	0	53	0
Lane Group Flow (vph)	0	1275	383	900	2100	0	0	0	0	0	922	0
Turn Type		NA	Perm	Prot	NA					Perm	NA	
Protected Phases		2		1	6						8	
Permitted Phases			2							8		
Actuated Green, G (s)		39.0	39.0	58.0	105.0						60.0	
Effective Green, g (s)		39.0	39.0	58.0	105.0						60.0	
Actuated g/C Ratio		0.22	0.22	0.32	0.58						0.33	
Clearance Time (s)		8.0	8.0	8.0	8.0						7.0	
Vehicle Extension (s)		3.0	3.0	4.0	3.0						4.0	
Lane Grp Cap (vph)		1101	342	570	2966						550	
v/s Ratio Prot		c0.25		c0.51	0.41							
v/s Ratio Perm			0.24								0.56	
v/c Ratio		1.16	1.12	1.58	0.71						1.68	
Uniform Delay, d1		70.5	70.5	61.0	26.6						60.0	
Progression Factor		1.00	1.00	1.00	1.00						1.00	
Incremental Delay, d2		81.6	85.6	268.9	1.5						312.5	
Delay (s)		152.1	156.1	329.9	28.1						372.5	
Level of Service		F	F	F	C						F	
Approach Delay (s)		153.5			118.6			0.0			372.5	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	171.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	172.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	88	150	300	525	1100	250
v/c Ratio	0.54	0.55	0.52	0.26	0.81	0.54	0.12
Control Delay	80.6	81.0	15.4	57.3	22.4	4.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	80.6	81.0	15.4	57.3	22.4	5.0	0.6
Queue Length 50th (ft)	93	94	0	77	85	102	2
Queue Length 95th (ft)	151	152	68	110	#307	287	2
Internal Link Dist (ft)		906		517			268
Turn Bay Length (ft)			430		60		
Base Capacity (vph)	430	430	517	1171	646	2252	2321
Starvation Cap Reductn	0	0	0	0	0	600	0
Spillback Cap Reductn	0	0	0	36	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.29	0.26	0.81	0.67	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	0	150	0	0	0	0	300	525	1100	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Lane Util. Factor	0.95	0.95	1.00					0.86	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					6408	1583	3433	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					6408	1583	3433	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	0	150	0	0	0	0	300	525	1100	250	0
RTOR Reduction (vph)	0	0	136	0	0	0	0	0	357	0	0	0
Lane Group Flow (vph)	87	88	14	0	0	0	0	300	168	1100	250	0
Turn Type	Split	NA	Perm					NA	Perm	Split	NA	
Protected Phases	2	2						1		6 8	6 8	
Permitted Phases			2						1			
Actuated Green, G (s)	15.2	15.2	15.2					29.2	29.2	94.6	94.6	
Effective Green, g (s)	15.2	15.2	15.2					29.2	29.2	94.6	94.6	
Actuated g/C Ratio	0.09	0.09	0.09					0.18	0.18	0.59	0.59	
Clearance Time (s)	7.0	7.0	7.0					7.0	7.0			
Vehicle Extension (s)	3.0	3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)	159	159	150					1169	288	2029	2092	
v/s Ratio Prot	0.05	c0.05						0.05		c0.32	0.07	
v/s Ratio Perm			0.01						c0.11			
v/c Ratio	0.55	0.55	0.10					0.26	0.58	0.54	0.12	
Uniform Delay, d1	69.1	69.2	66.1					56.1	59.8	19.7	14.4	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.18	0.03	
Incremental Delay, d2	3.8	4.1	0.3					0.2	3.5	0.3	0.0	
Delay (s)	72.9	73.3	66.4					56.3	63.3	3.9	0.5	
Level of Service	E	E	E					E	E	A	A	
Approach Delay (s)		70.0			0.0			60.8			3.2	
Approach LOS		E			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	10	10	1325	600	400	1300	600
v/c Ratio	0.04	0.04	0.84	0.54	0.35	0.52	0.67
Control Delay	53.3	53.3	5.4	29.7	32.6	27.5	9.7
Queue Delay	0.0	0.0	0.0	0.3	0.2	0.0	0.2
Total Delay	53.3	53.3	5.4	30.0	32.7	27.5	9.9
Queue Length 50th (ft)	9	9	0	117	91	187	79
Queue Length 95th (ft)	28	28	0	104	86	258	134
Internal Link Dist (ft)		774			268	733	
Turn Bay Length (ft)	460		450				220
Base Capacity (vph)	367	367	1583	1657	1708	2522	892
Starvation Cap Reductn	0	0	0	477	601	0	27
Spillback Cap Reductn	0	0	0	0	0	64	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.84	0.51	0.36	0.53	0.69

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	1325	600	400	0	0	1300	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	4.0	7.0	7.0			7.0	7.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.86	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1681	1583	3433	3539			6408	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1681	1583	3433	3539			6408	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	20	0	1325	600	400	0	0	1300	600
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	269
Lane Group Flow (vph)	0	0	0	10	10	1325	600	400	0	0	1300	331
Turn Type				Split	NA	Free	Split	NA			NA	Perm
Protected Phases				8	8		1 2	1 2			6	
Permitted Phases						Free						6
Actuated Green, G (s)				24.5	24.5	160.0	51.4	51.4			63.1	63.1
Effective Green, g (s)				24.5	24.5	160.0	51.4	51.4			63.1	63.1
Actuated g/C Ratio				0.15	0.15	1.00	0.32	0.32			0.39	0.39
Clearance Time (s)				7.0	7.0						7.0	7.0
Vehicle Extension (s)				3.0	3.0						3.0	3.0
Lane Grp Cap (vph)				257	257	1583	1102	1136			2527	624
v/s Ratio Prot				0.01	0.01		0.17	0.11			0.20	
v/s Ratio Perm						c0.84						0.21
v/c Ratio				0.04	0.04	0.84	0.54	0.35			0.51	0.53
Uniform Delay, d1				57.7	57.7	0.0	44.7	41.6			36.8	37.1
Progression Factor				1.00	1.00	1.00	0.62	0.77			0.70	0.62
Incremental Delay, d2				0.1	0.1	5.4	0.7	0.3			0.5	2.4
Delay (s)				57.8	57.8	5.4	28.5	32.1			26.4	25.4
Level of Service				E	E	A	C	C			C	C
Approach Delay (s)		0.0			6.2			30.0			26.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	625	1375	900	125	1125	125	700	350	175	325	400	700
v/c Ratio	1.27	1.07	1.07	1.28	1.14	0.23	1.22	0.33	0.30	0.79	0.45	1.24
Control Delay	193.6	97.6	80.9	241.4	125.4	9.5	174.5	50.9	10.1	91.5	59.0	159.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	193.6	97.6	80.9	241.4	125.4	9.5	174.5	50.9	10.1	91.5	59.0	159.4
Queue Length 50th (ft)	~476	~938	~850	~190	~804	16	~521	172	14	194	212	~814
Queue Length 95th (ft)	#606	#1077	#1119	m#334	#948	m59	#655	225	80	251	269	#1076
Internal Link Dist (ft)		1623			621			1129			657	
Turn Bay Length (ft)	560			330			415		305	365		275
Base Capacity (vph)	493	1291	839	98	983	547	572	1051	580	457	884	563
Starvation Cap Reductn	0	0	0	0	8	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	1.07	1.07	1.28	1.15	0.23	1.22	0.33	0.30	0.71	0.45	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	625	1375	900	125	1125	125	700	350	175	325	400	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3416	3522	1575	1770	3539	1577	3433	3539	1577	3433	3539	1577
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3416	3522	1575	1770	3539	1577	3433	3539	1577	3433	3539	1577
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	625	1375	900	125	1125	125	700	350	175	325	400	700
RTOR Reduction (vph)	0	0	262	0	0	90	0	0	111	0	0	170
Lane Group Flow (vph)	625	1375	638	125	1125	35	700	350	64	325	400	531
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	1	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	26.0	66.0	66.0	10.0	50.0	50.0	30.0	53.5	53.5	21.5	45.0	45.0
Effective Green, g (s)	26.0	66.0	66.0	10.0	50.0	50.0	30.0	53.5	53.5	21.5	45.0	45.0
Actuated g/C Ratio	0.14	0.37	0.37	0.06	0.28	0.28	0.17	0.30	0.30	0.12	0.25	0.25
Clearance Time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	4.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	493	1291	577	98	983	438	572	1051	468	410	884	394
v/s Ratio Prot	c0.18	0.39		0.07	0.32		c0.20	0.10		0.09	0.11	
v/s Ratio Perm			c0.41			0.02			0.04			c0.34
v/c Ratio	1.27	1.07	1.11	1.28	1.14	0.08	1.22	0.33	0.14	0.79	0.45	1.35
Uniform Delay, d1	77.0	57.0	57.0	85.0	65.0	48.0	75.0	49.3	46.3	77.1	57.1	67.5
Progression Factor	1.00	1.00	1.00	1.21	0.90	3.07	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	135.8	44.3	70.1	170.3	74.5	0.3	115.7	0.2	0.1	10.1	0.4	172.0
Delay (s)	212.8	101.3	127.1	273.0	132.7	147.7	190.7	49.5	46.5	87.2	57.5	239.5
Level of Service	F	F	F	F	F	F	F	D	D	F	E	F
Approach Delay (s)		133.4			146.8			129.7			153.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	139.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	112.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	SER	NWL	NWR	NET	NER	SWL	SWT
Lane Group Flow (vph)	30	263	262	55	127	725	28	13	375
v/c Ratio	0.07	0.39	0.39	0.42	0.38	0.39	0.03	0.03	0.18
Control Delay	49.4	1.7	1.7	66.2	5.9	7.3	0.1	15.6	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	49.4	1.7	1.7	66.2	5.9	7.6	0.1	15.6	14.2
Queue Length 50th (ft)	11	0	0	45	0	57	0	4	65
Queue Length 95th (ft)	26	0	0	88	27	70	0	17	126
Internal Link Dist (ft)		377				190			349
Turn Bay Length (ft)	200		200					400	
Base Capacity (vph)	475	690	690	394	547	1872	908	377	2090
Starvation Cap Reductn	0	0	0	0	0	526	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.38	0.14	0.23	0.54	0.03	0.03	0.18

Intersection Summary

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	30	0	525	55	0	127	0	725	28	13	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	0.95	1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.85	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1504	1504	1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.28	1.00	
Satd. Flow (perm)	3433	1504	1504	1770		1583		3539	1583	525	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	0	525	55	0	127	0	725	28	13	375	0
RTOR Reduction (vph)	0	230	229	0	0	111	0	0	13	0	0	0
Lane Group Flow (vph)	30	33	33	55	0	16	0	725	15	13	375	0
Turn Type	Split	NA	Prot	Prot		custom		NA	Perm	pm+pt	NA	
Protected Phases	4	4	4	3		3 5		6		5	2	
Permitted Phases									6	2		
Actuated Green, G (s)	16.5	16.5	16.5	9.7		16.7		68.8	68.8	72.6	72.6	
Effective Green, g (s)	16.5	16.5	16.5	9.7		16.7		68.8	68.8	72.6	72.6	
Actuated g/C Ratio	0.13	0.13	0.13	0.07		0.13		0.53	0.53	0.56	0.56	
Clearance Time (s)	7.0	7.0	7.0	7.0				7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	435	190	190	132		203		1872	837	360	1976	
v/s Ratio Prot	0.01	c0.02	0.02	c0.03		0.01		c0.20		0.00	c0.11	
v/s Ratio Perm									0.01	0.02		
v/c Ratio	0.07	0.18	0.18	0.42		0.08		0.39	0.02	0.04	0.19	
Uniform Delay, d1	50.0	50.7	50.7	57.4		49.9		18.1	14.5	13.8	14.2	
Progression Factor	1.00	1.00	1.00	1.00		1.00		0.35	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.4	0.4	2.1		0.2		0.6	0.0	0.0	0.2	
Delay (s)	50.1	51.1	51.1	59.6		50.1		7.0	14.6	13.9	14.4	
Level of Service	D	D	D	E		D		A	B	B	B	
Approach Delay (s)		51.1			52.9			7.3			14.4	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NET	SWT
Lane Group Flow (vph)	295	40	325
v/c Ratio	0.58	0.03	0.17
Control Delay	17.2	9.4	9.7
Queue Delay	0.0	0.0	0.0
Total Delay	17.2	9.4	9.7
Queue Length 50th (ft)	57	3	17
Queue Length 95th (ft)	110	11	35
Internal Link Dist (ft)	1324	350	136
Turn Bay Length (ft)			
Base Capacity (vph)	1763	2855	4102
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.01	0.08

Intersection Summary

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	275	20	40	0	0	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.91
Frt	0.99		1.00			1.00
Flt Protected	0.96		1.00			1.00
Satd. Flow (prot)	1763		3539			5085
Flt Permitted	0.96		1.00			1.00
Satd. Flow (perm)	1763		3539			5085
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	275	20	40	0	0	325
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	295	0	40	0	0	325
Turn Type	NA		NA			NA
Protected Phases	4		6			2
Permitted Phases						
Actuated Green, G (s)	11.9		15.1			15.1
Effective Green, g (s)	11.9		15.1			15.1
Actuated g/C Ratio	0.29		0.37			0.37
Clearance Time (s)	7.0		7.0			7.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	511		1303			1872
v/s Ratio Prot	c0.17		0.01			c0.06
v/s Ratio Perm						
v/c Ratio	0.58		0.03			0.17
Uniform Delay, d1	12.4		8.3			8.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.6		0.0			0.0
Delay (s)	14.0		8.3			8.8
Level of Service	B		A			A
Approach Delay (s)	14.0		8.3			8.8
Approach LOS	B		A			A

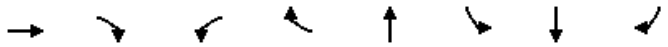
Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	41.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	645	20	725	600	40
v/c Ratio	0.76	0.19	0.33	0.30	0.03
Control Delay	30.6	42.6	8.5	8.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	42.6	8.5	8.6	0.1
Queue Length 50th (ft)	130	10	88	51	0
Queue Length 95th (ft)	181	32	132	117	0
Internal Link Dist (ft)	455		930	1767	
Turn Bay Length (ft)		300			300
Base Capacity (vph)	987	104	2213	2013	1429
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.19	0.33	0.30	0.03

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	625	20	20	725	600	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0	6.5	6.5	7.0
Lane Util. Factor	0.97		1.00	0.95	0.95	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3431		1770	3539	3539	1583
Flt Permitted	0.95		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3431		1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	625	20	20	725	600	40
RTOR Reduction (vph)	106	0	0	0	0	11
Lane Group Flow (vph)	539	0	20	725	600	29
Turn Type	NA		Prot	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases						6
Actuated Green, G (s)	18.3		2.0	53.2	44.2	62.5
Effective Green, g (s)	18.3		2.0	53.2	44.2	62.5
Actuated g/C Ratio	0.22		0.02	0.63	0.52	0.74
Clearance Time (s)	7.0		7.0	6.5	6.5	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	738		41	2214	1840	1163
v/s Ratio Prot	c0.16		0.01	c0.20	0.17	0.01
v/s Ratio Perm						0.01
v/c Ratio	0.73		0.49	0.33	0.33	0.03
Uniform Delay, d1	31.1		41.0	7.5	11.8	3.0
Progression Factor	1.00		1.00	1.00	0.75	0.25
Incremental Delay, d2	3.7		8.9	0.4	0.5	0.0
Delay (s)	34.8		49.9	7.9	9.3	0.8
Level of Service	C		D	A	A	A
Approach Delay (s)	34.8			9.0	8.8	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	70	125	150	725	1940	150	1425	750
v/c Ratio	0.57	0.08	0.56	0.70	0.78	0.74	0.61	0.47
Control Delay	98.9	0.1	73.6	28.2	18.0	97.5	19.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.9	0.1	73.6	28.2	18.0	97.5	19.4	1.0
Queue Length 50th (ft)	81	0	149	185	387	174	500	0
Queue Length 95th (ft)	142	0	m201	m248	232	255	573	0
Internal Link Dist (ft)	610				1235		338	
Turn Bay Length (ft)		270		365		390		
Base Capacity (vph)	140	1530	275	1022	2480	245	2326	1584
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.08	0.55	0.71	0.78	0.61	0.61	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	70	125	150	0	725	0	1850	90	150	1425	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			3%			1%			-4%	
Total Lost time (s)		7.0	4.0	7.0		7.0		7.0		7.0	7.0	4.0
Lane Util. Factor		1.00	1.00	1.00		0.88		0.91		1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85		0.99		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)		1800	1530	1710		2692		4928		1770	3541	1584
Flt Permitted		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)		1800	1530	1710		2692		4928		1770	3541	1584
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	70	125	150	0	725	0	1850	90	150	1425	750
RTOR Reduction (vph)	0	0	0	0	0	193	0	2	0	0	0	0
Lane Group Flow (vph)	0	70	125	150	0	532	0	1938	0	150	1425	750
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Free	Prot		custom		NA		Prot	NA	Free
Protected Phases		3		4		4 1		2		1	6	
Permitted Phases			Free									Free
Actuated Green, G (s)		12.3	180.0	28.4		56.2		90.5		20.8	118.3	180.0
Effective Green, g (s)		12.3	180.0	28.4		56.2		90.5		20.8	118.3	180.0
Actuated g/C Ratio		0.07	1.00	0.16		0.31		0.50		0.12	0.66	1.00
Clearance Time (s)		7.0		7.0				7.0		7.0	7.0	
Vehicle Extension (s)		4.0		4.0				5.0		4.0	5.0	
Lane Grp Cap (vph)		123	1530	269		840		2477		204	2327	1584
v/s Ratio Prot		0.04		0.09		c0.20		c0.39		0.08	c0.40	
v/s Ratio Perm			0.08									c0.47
v/c Ratio		0.57	0.08	0.56		0.63		0.78		0.74	0.61	0.47
Uniform Delay, d1		81.3	0.0	70.0		53.1		36.7		76.9	17.7	0.0
Progression Factor		1.00	1.00	0.95		0.78		0.44		1.00	1.00	1.00
Incremental Delay, d2		7.2	0.1	2.5		1.4		1.3		13.7	1.2	1.0
Delay (s)		88.4	0.1	69.2		43.1		17.5		90.6	18.9	1.0
Level of Service		F	A	E		D		B		F	B	A
Approach Delay (s)		31.8			47.5			17.5			17.8	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	325	10	90	40	125	20	1525	10	60	1400	90
v/c Ratio	0.86	0.02	0.21	0.51	0.70	0.13	0.83	0.01	0.50	0.71	0.10
Control Delay	87.0	51.4	4.7	106.3	37.2	14.8	29.4	0.0	40.1	20.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	87.0	51.4	4.7	106.3	37.2	14.8	29.6	0.0	40.1	20.1	0.5
Queue Length 50th (ft)	364	9	0	47	13	6	815	0	17	312	0
Queue Length 95th (ft)	#511	27	29	94	#91	m11	671	m0	m58	336	7
Internal Link Dist (ft)		602		1004			953			1235	
Turn Bay Length (ft)	80		80			360		390	380		
Base Capacity (vph)	406	452	461	85	184	149	1848	875	119	1962	868
Starvation Cap Reductn	0	0	0	0	0	0	27	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.02	0.20	0.47	0.68	0.13	0.84	0.01	0.50	0.71	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	325	10	90	30	10	125	20	1525	10	60	1400	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1719	1516	1752	3505	1562	1752	3498	1462
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.10	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1719	1516	183	3505	1562	108	3498	1462
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	325	10	90	30	10	125	20	1525	10	60	1400	90
RTOR Reduction (vph)	0	0	69	0	0	109	0	0	5	0	0	41
Lane Group Flow (vph)	325	10	21	0	40	16	20	1525	5	60	1400	49
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	42.1	42.1	42.1		8.2	8.2	97.9	94.9	94.9	104.5	98.2	98.2
Effective Green, g (s)	42.1	42.1	42.1		8.2	8.2	97.9	94.9	94.9	104.5	98.2	98.2
Actuated g/C Ratio	0.23	0.23	0.23		0.05	0.05	0.54	0.53	0.53	0.58	0.55	0.55
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	379	423	352		78	69	125	1847	823	120	1908	797
v/s Ratio Prot	c0.20	0.01			c0.02		0.00	c0.44		c0.02	c0.40	
v/s Ratio Perm			0.01			0.01	0.08		0.00	0.27		0.03
v/c Ratio	0.86	0.02	0.06		0.51	0.23	0.16	0.83	0.01	0.50	0.73	0.06
Uniform Delay, d1	66.1	53.1	53.6		83.9	82.9	25.1	35.6	20.2	30.6	31.0	19.2
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.84	0.70	1.00	1.63	0.59	0.19
Incremental Delay, d2	20.0	0.1	0.3		5.6	1.8	0.5	3.5	0.0	2.7	2.1	0.1
Delay (s)	86.1	53.2	53.8		89.5	84.6	21.5	28.6	20.2	52.5	20.4	3.8
Level of Service	F	D	D		F	F	C	C	C	D	C	A
Approach Delay (s)		78.5			85.8			28.4			20.7	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	70	125	1450	60	40	1425
v/c Ratio	0.56	0.56	0.55	0.05	0.15	0.49
Control Delay	93.8	22.4	9.9	1.2	1.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	93.8	22.4	9.9	1.2	1.1	0.7
Queue Length 50th (ft)	81	6	343	0	0	7
Queue Length 95th (ft)	137	76	461	12	m1	14
Internal Link Dist (ft)	56		3201			953
Turn Bay Length (ft)				350	405	
Base Capacity (vph)	223	300	2633	1193	276	2909
Starvation Cap Reductn	0	0	0	0	0	233
Spillback Cap Reductn	0	2	68	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.42	0.57	0.05	0.14	0.53

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	70	125	1450	60	40	1425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		4%			-1%
Total Lost time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1388	1242	3402	1522	1744	3489
Flt Permitted	0.95	1.00	1.00	1.00	0.14	1.00
Satd. Flow (perm)	1388	1242	3402	1522	262	3489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	125	1450	60	40	1425
RTOR Reduction (vph)	0	109	0	14	0	0
Lane Group Flow (vph)	70	16	1450	46	40	1425
Heavy Vehicles (%)	30%	30%	4%	4%	4%	4%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	16.4	16.4	137.9	137.9	150.1	150.1
Effective Green, g (s)	16.4	16.4	137.9	137.9	150.1	150.1
Actuated g/C Ratio	0.09	0.09	0.77	0.77	0.83	0.83
Clearance Time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Vehicle Extension (s)	5.0	5.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	126	113	2606	1166	261	2909
v/s Ratio Prot	c0.05		c0.43		0.00	c0.41
v/s Ratio Perm		0.01		0.03	0.12	
v/c Ratio	0.56	0.14	0.56	0.04	0.15	0.49
Uniform Delay, d1	78.3	75.3	8.6	5.1	5.7	4.2
Progression Factor	1.00	1.00	1.00	1.00	0.08	0.04
Incremental Delay, d2	8.7	1.2	0.9	0.1	0.2	0.4
Delay (s)	87.0	76.5	9.4	5.1	0.6	0.6
Level of Service	F	E	A	A	A	A
Approach Delay (s)	80.3		9.3			0.6
Approach LOS	F		A			A

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	600	840	30	450	125	70	30	250	80	525
v/c Ratio	1.31	0.90	0.27	0.64	0.18	0.51	0.11	0.56	0.17	1.33
Control Delay	181.9	40.1	26.8	47.5	1.4	79.3	0.8	43.6	33.0	200.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.9	40.1	26.8	47.5	1.4	79.3	0.8	43.6	33.0	200.4
Queue Length 50th (ft)	~593	816	13	380	0	67	0	233	58	~673
Queue Length 95th (ft)	#835	#1170	33	531	8	118	0	311	87	#907
Internal Link Dist (ft)		3024		1297		1097			1436	
Turn Bay Length (ft)	220		315					380		
Base Capacity (vph)	459	933	111	699	682	336	434	443	466	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.31	0.90	0.27	0.64	0.18	0.21	0.07	0.56	0.17	1.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	600	800	40	30	450	125	20	50	30	250	80	525
Ideal Flow (vphpl)	2000	1900	1900	1900	2000	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			4%			-3%	
Total Lost time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1835	1822		1787	1980	1599		1800	1552	1796	1891	1607
Flt Permitted	0.22	1.00		0.08	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	419	1822		146	1980	1599		1800	1552	1796	1891	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	600	800	40	30	450	125	20	50	30	250	80	525
RTOR Reduction (vph)	0	1	0	0	0	82	0	0	28	0	0	0
Lane Group Flow (vph)	600	839	0	30	450	43	0	70	2	250	80	525
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2			3			4
Actuated Green, G (s)	82.6	72.6		54.6	51.6	51.6		9.9	9.9	37.0	37.0	37.0
Effective Green, g (s)	82.6	72.6		54.6	51.6	51.6		9.9	9.9	37.0	37.0	37.0
Actuated g/C Ratio	0.55	0.48		0.36	0.34	0.34		0.07	0.07	0.25	0.25	0.25
Clearance Time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	457	881		85	681	550		118	102	443	466	396
v/s Ratio Prot	c0.21	0.46		0.01	0.23			c0.04		0.14	0.04	
v/s Ratio Perm	c0.51			0.12		0.03			0.00			c0.33
v/c Ratio	1.31	0.95		0.35	0.66	0.08		0.59	0.02	0.56	0.17	1.33
Uniform Delay, d1	30.0	37.0		36.5	41.8	33.2		68.1	65.5	49.4	44.4	56.5
Progression Factor	1.34	0.72		1.00	1.00	1.00		1.00	1.00	0.77	0.72	0.82
Incremental Delay, d2	155.6	20.6		1.8	5.0	0.3		7.8	0.1	1.6	0.2	163.0
Delay (s)	195.7	47.2		38.3	46.8	33.4		75.9	65.6	39.6	32.1	209.3
Level of Service	F	D		D	D	C		E	E	D	C	F
Approach Delay (s)		109.1			43.6			72.8			143.1	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	104.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	800	475	450	850	575	450
v/c Ratio	0.64	0.55	0.81	0.43	0.89	0.28
Control Delay	49.6	17.6	63.4	20.8	61.6	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	17.6	63.4	20.8	61.6	14.5
Queue Length 50th (ft)	184	1	222	286	519	104
Queue Length 95th (ft)	417	320	m219	m282	646	125
Internal Link Dist (ft)	1397			2206	648	
Turn Bay Length (ft)		400	500		300	
Base Capacity (vph)	1251	867	602	1966	731	1618
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.55	0.75	0.43	0.79	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	800	475	450	850	575	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	800	475	450	850	575	450
RTOR Reduction (vph)	0	307	0	0	0	21
Lane Group Flow (vph)	800	168	450	850	575	429
Turn Type	NA	Perm	Prot	NA	NA	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	53.1	53.1	24.3	83.4	54.6	84.9
Effective Green, g (s)	53.1	53.1	24.3	83.4	54.6	84.9
Actuated g/C Ratio	0.35	0.35	0.16	0.56	0.36	0.57
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1252	560	556	1967	644	1577
v/s Ratio Prot	c0.23		c0.13	0.24	c0.32	0.15
v/s Ratio Perm		0.11				
v/c Ratio	0.64	0.30	0.81	0.43	0.89	0.27
Uniform Delay, d1	40.4	35.0	60.6	19.5	44.9	16.7
Progression Factor	1.11	4.57	0.92	0.99	1.00	1.00
Incremental Delay, d2	2.1	1.2	5.5	0.4	14.7	0.1
Delay (s)	47.1	161.1	61.2	19.7	59.7	16.8
Level of Service	D	F	E	B	E	B
Approach Delay (s)	89.6			34.1	40.8	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	55.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	10	1250	30	10	1425	325	100
v/c Ratio	0.06	0.58	0.03	0.04	0.65	0.70	0.20
Control Delay	11.7	18.5	0.1	19.2	30.7	57.2	7.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	18.8	0.1	19.2	30.7	57.2	7.4
Queue Length 50th (ft)	3	233	0	5	508	287	0
Queue Length 95th (ft)	m10	618	1	m9	m701	367	43
Internal Link Dist (ft)		603			592	815	
Turn Bay Length (ft)	180		290	400			680
Base Capacity (vph)	180	2146	991	230	2189	578	584
Starvation Cap Reductn	0	334	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.69	0.03	0.04	0.65	0.56	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1250	30	10	1425	0	325	0	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00			
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00			
Satd. Flow (prot)	1752	3504	1567	1787	3575			1770	1583			
Flt Permitted	0.11	1.00	1.00	0.15	1.00			0.95	1.00			
Satd. Flow (perm)	196	3504	1567	279	3575			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	1250	30	10	1425	0	325	0	100	0	0	0
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	10	1250	18	10	1425	0	0	325	26	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4		4	8		
Actuated Green, G (s)	89.9	87.7	87.7	89.9	87.7			39.6	39.6			
Effective Green, g (s)	89.9	87.7	87.7	89.9	87.7			39.6	39.6			
Actuated g/C Ratio	0.60	0.58	0.58	0.60	0.58			0.26	0.26			
Clearance Time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0			3.0	3.0			
Lane Grp Cap (vph)	140	2048	916	189	2090			467	417			
v/s Ratio Prot	c0.00	0.36		0.00	c0.40							
v/s Ratio Perm	0.04		0.01	0.03				0.18	0.02			
v/c Ratio	0.07	0.61	0.02	0.05	0.68			0.70	0.06			
Uniform Delay, d1	17.1	20.1	13.1	15.1	21.5			49.8	41.3			
Progression Factor	0.90	0.87	1.00	1.55	1.38			1.00	1.00			
Incremental Delay, d2	0.2	1.4	0.0	0.1	1.3			4.5	0.1			
Delay (s)	15.6	18.8	13.1	23.4	31.1			54.2	41.4			
Level of Service	B	B	B	C	C			D	D			
Approach Delay (s)		18.7			31.0			51.2			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	400	10	20	875	450	70	375	250	300	125	375
v/c Ratio	0.69	0.21	0.01	0.12	0.56	0.43	0.25	0.71	0.48	1.00	0.15	0.52
Control Delay	72.7	20.0	0.0	77.6	24.8	5.1	39.6	68.7	9.5	110.5	46.0	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	72.7	20.1	0.0	77.6	24.8	5.3	39.6	68.7	9.6	110.5	46.0	13.4
Queue Length 50th (ft)	135	113	0	10	232	44	49	186	12	239	32	46
Queue Length 95th (ft)	180	162	0	m16	314	54	84	233	81	#369	68	74
Internal Link Dist (ft)		1562			603			1172			469	
Turn Bay Length (ft)	440		360	365		410	410		360	300		290
Base Capacity (vph)	409	1870	1009	167	1564	1036	276	1074	650	301	1299	719
Starvation Cap Reductn	0	0	0	0	0	164	0	0	0	0	0	43
Spillback Cap Reductn	0	167	0	0	0	0	0	0	11	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.23	0.01	0.12	0.56	0.52	0.25	0.35	0.39	1.00	0.10	0.55

Intersection Summary

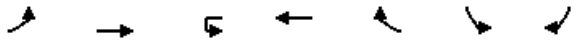
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	400	10	20	875	450	70	375	250	300	125	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-5%			-3%			-4%	
Total Lost time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3364	3468	1552	3519	3628	1623	1832	3664	1639	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.67	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	3364	3468	1552	3519	3628	1623	1297	3664	1639	498	3610	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	275	400	10	20	875	450	70	375	250	300	125	375
RTOR Reduction (vph)	0	0	5	0	0	82	0	0	191	0	0	80
Lane Group Flow (vph)	275	400	5	20	875	368	70	375	59	300	125	295
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	17.7	76.7	82.3	4.3	63.3	80.3	28.6	23.0	27.3	47.0	34.4	52.1
Effective Green, g (s)	17.7	76.7	82.3	4.3	63.3	80.3	28.6	23.0	27.3	47.0	34.4	52.1
Actuated g/C Ratio	0.12	0.51	0.55	0.03	0.42	0.54	0.19	0.15	0.18	0.31	0.23	0.35
Clearance Time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	396	1773	851	100	1531	868	267	561	298	304	827	560
v/s Ratio Prot	c0.08	0.12	0.00	0.01	c0.24	0.05	0.01	0.10	0.01	c0.11	0.03	0.06
v/s Ratio Perm			0.00			0.18	0.04		0.03	c0.20		0.12
v/c Ratio	0.69	0.23	0.01	0.20	0.57	0.42	0.26	0.67	0.20	0.99	0.15	0.53
Uniform Delay, d1	63.6	20.2	15.3	71.2	33.0	21.0	51.1	59.9	52.0	46.3	46.1	39.1
Progression Factor	1.00	1.00	1.00	1.12	0.71	0.39	1.00	1.00	1.00	1.40	0.98	0.48
Incremental Delay, d2	5.2	0.3	0.0	0.8	1.2	0.3	0.5	3.0	0.3	46.2	0.1	0.9
Delay (s)	68.8	20.5	15.3	80.1	24.6	8.3	51.6	62.9	52.4	110.8	45.4	19.6
Level of Service	E	C	B	F	C	A	D	E	D	F	D	B
Approach Delay (s)		39.8			19.9			58.0			57.8	
Approach LOS		D			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	10	425	1175	180
v/c Ratio	0.04	0.22	0.66	0.44
Control Delay	5.8	6.5	12.4	20.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.8	6.5	12.4	20.0
Queue Length 50th (ft)	1	30	108	27
Queue Length 95th (ft)	7	60	305	119
Internal Link Dist (ft)		2661	1814	972
Turn Bay Length (ft)	275			
Base Capacity (vph)	327	3480	3399	1490
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.03	0.12	0.35	0.12

Intersection Summary



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	10	425	0	900	275	150	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%		-1%		-6%	
Total Lost time (s)	7.0	6.5		6.5		7.0	
Lane Util. Factor	1.00	0.95		0.95		1.00	
Frt	1.00	1.00		0.96		0.98	
Flt Protected	0.95	1.00		1.00		0.96	
Satd. Flow (prot)	1744	3480		3399		1836	
Flt Permitted	0.12	1.00		1.00		0.96	
Satd. Flow (perm)	228	3480		3399		1836	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	425	0	900	275	150	30
RTOR Reduction (vph)	0	0	0	22	0	52	0
Lane Group Flow (vph)	10	425	0	1153	0	128	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	0%	0%
Bus Blockages (#/hr)	0	1	0	0	0	0	0
Turn Type	pm+pt	NA	Prot	NA		NA	
Protected Phases	5	2	1	6		3	
Permitted Phases	2						
Actuated Green, G (s)	36.6	36.6		28.8		10.8	
Effective Green, g (s)	36.6	36.6		28.8		10.8	
Actuated g/C Ratio	0.60	0.60		0.47		0.18	
Clearance Time (s)	7.0	6.5		6.5		7.0	
Vehicle Extension (s)	2.5	3.0		3.0		3.0	
Lane Grp Cap (vph)	156	2091		1607		325	
v/s Ratio Prot	0.00	c0.12		c0.34		c0.07	
v/s Ratio Perm	0.04						
v/c Ratio	0.06	0.20		0.72		0.39	
Uniform Delay, d1	7.4	5.5		12.8		22.2	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.1	0.0		1.6		0.8	
Delay (s)	7.5	5.6		14.4		22.9	
Level of Service	A	A		B		C	
Approach Delay (s)		5.6		14.4		22.9	
Approach LOS		A		B		C	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	20.5
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	450	20	20	1050	100	100	475
v/c Ratio	0.28	0.03	0.05	0.48	0.24	0.24	0.81
Control Delay	26.4	0.1	29.6	6.6	28.7	28.7	36.4
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	26.4	0.1	29.6	6.9	28.7	28.7	36.4
Queue Length 50th (ft)	78	0	6	105	52	52	218
Queue Length 95th (ft)	106	0	m14	332	86	86	295
Internal Link Dist (ft)	2158			451		781	
Turn Bay Length (ft)		260	190		525		500
Base Capacity (vph)	1585	575	402	2181	629	629	823
Starvation Cap Reductn	0	0	0	531	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.03	0.05	0.64	0.16	0.16	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	450	20	20	1050	0	0	0	0	200	0	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050
Grade (%)		2%			-2%			0%			3%	
Total Lost time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	1.00
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5034	1567	1787	3575					1656	1656	1980
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5034	1567	1787	3575					1656	1656	1980
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	450	20	20	1050	0	0	0	0	200	0	475
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	0	0	0	86
Lane Group Flow (vph)	0	450	6	20	1050	0	0	0	0	100	100	389
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			2									
Actuated Green, G (s)		31.5	31.5	22.5	61.0					25.5	25.5	25.5
Effective Green, g (s)		31.5	31.5	22.5	61.0					25.5	25.5	25.5
Actuated g/C Ratio		0.32	0.32	0.22	0.61					0.26	0.26	0.26
Clearance Time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Vehicle Extension (s)		5.0	5.0	3.5	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1585	493	402	2180					422	422	504
v/s Ratio Prot		0.09		0.01	c0.29					0.06	0.06	c0.20
v/s Ratio Perm			0.00									
v/c Ratio		0.28	0.01	0.05	0.48					0.24	0.24	0.77
Uniform Delay, d1		25.8	23.6	30.4	10.8					29.5	29.5	34.6
Progression Factor		1.00	1.00	0.83	0.50					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.0	0.2	0.6					0.3	0.3	7.2
Delay (s)		26.2	23.6	25.5	6.0					29.8	29.8	41.8
Level of Service		C	C	C	A					C	C	D
Approach Delay (s)		26.1			6.3			0.0			38.2	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	125	500	850	200	355	125
v/c Ratio	0.35	0.23	0.55	0.25	0.78	0.31
Control Delay	32.7	21.5	24.3	4.2	46.4	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	21.5	24.3	4.2	46.4	30.4
Queue Length 50th (ft)	43	113	205	0	211	64
Queue Length 95th (ft)	74	218	317	48	280	102
Internal Link Dist (ft)		451	1741		948	
Turn Bay Length (ft)	184			280		215
Base Capacity (vph)	360	2129	1542	803	634	564
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.23	0.55	0.25	0.56	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	500	0	0	850	200	325	30	125	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			0%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3399	3504			3575	1599		1763	1567			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3399	3504			3575	1599		1763	1567			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	500	0	0	850	200	325	30	125	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	114	0	0	0	0	0	0
Lane Group Flow (vph)	125	500	0	0	850	86	0	355	125	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	5	2			6		4	4	4			
Permitted Phases						6						
Actuated Green, G (s)	10.6	60.8			43.2	43.2		25.7	25.7			
Effective Green, g (s)	10.6	60.8			43.2	43.2		25.7	25.7			
Actuated g/C Ratio	0.11	0.61			0.43	0.43		0.26	0.26			
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Vehicle Extension (s)	4.0	5.0			5.0	5.0		3.0	3.0			
Lane Grp Cap (vph)	360	2130			1544	690		453	402			
v/s Ratio Prot	c0.04	0.14			c0.24			c0.20	0.08			
v/s Ratio Perm						0.05						
v/c Ratio	0.35	0.23			0.55	0.13		0.78	0.31			
Uniform Delay, d1	41.5	9.0			21.2	17.1		34.6	30.0			
Progression Factor	0.73	2.13			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.8	0.3			1.4	0.4		8.6	0.4			
Delay (s)	30.9	19.4			22.6	17.4		43.2	30.4			
Level of Service	C	B			C	B		D	C			
Approach Delay (s)		21.7			21.6			39.9			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

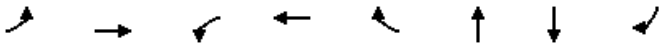
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	30	405	667	663	450	90	225	650
v/c Ratio	0.18	0.24	0.65	0.88	0.70	0.61	0.21	0.44	0.44
Control Delay	74.1	42.3	38.5	32.2	20.1	51.8	3.0	56.0	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	42.3	38.5	32.2	20.1	51.8	3.0	56.0	29.0
Queue Length 50th (ft)	16	8	283	304	327	173	0	85	193
Queue Length 95th (ft)	56	51	476	604	553	315	13	171	351
Internal Link Dist (ft)		1005		682		1789			2364
Turn Bay Length (ft)	170		310				390	470	
Base Capacity (vph)	112	125	1277	1195	1304	1171	611	1443	2330
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.24	0.32	0.56	0.51	0.38	0.15	0.16	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	20	450	10	1275	0	450	90	225	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95		0.95	1.00	0.97	0.95	
Frt	1.00	0.90		1.00	0.86	0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1693		1732	1501	1550		3504	1567	3399	3504	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1693		1732	1501	1550		3504	1567	3399	3504	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	10	20	450	10	1275	0	450	90	225	650	0
RTOR Reduction (vph)	0	19	0	0	215	54	0	0	70	0	0	0
Lane Group Flow (vph)	20	11	0	405	452	609	0	450	20	225	650	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	5.2	5.2		44.7	44.7	63.5		26.8	26.8	18.8	52.6	
Effective Green, g (s)	5.2	5.2		44.7	44.7	63.5		26.8	26.8	18.8	52.6	
Actuated g/C Ratio	0.04	0.04		0.36	0.36	0.51		0.22	0.22	0.15	0.43	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0		5.0	5.0	4.0	5.0	
Lane Grp Cap (vph)	75	71		626	543	884		760	340	517	1492	
v/s Ratio Prot	c0.01	0.01		0.23	c0.30	c0.10		c0.13		0.07	0.19	
v/s Ratio Perm						0.29			0.01			
v/c Ratio	0.27	0.15		0.65	0.83	0.69		0.59	0.06	0.44	0.44	
Uniform Delay, d1	57.3	57.0		32.8	36.0	22.6		43.4	38.3	47.5	25.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	1.0		2.3	10.5	2.4		1.9	0.1	0.8	0.4	
Delay (s)	59.2	58.0		35.1	46.5	25.0		45.3	38.5	48.3	25.4	
Level of Service	E	E		D	D	C		D	D	D	C	
Approach Delay (s)		58.5			35.6			44.2			31.3	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	123.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	200	860	10	1750	90	20	375	525
v/c Ratio	1.68	0.29	0.12	0.68	0.10	0.10	0.91	0.82
Control Delay	373.2	15.3	72.0	31.2	1.2	0.9	83.1	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	373.2	15.3	72.0	31.2	1.2	0.9	83.1	28.9
Queue Length 50th (ft)	~290	132	10	516	0	0	354	165
Queue Length 95th (ft)	#447	220	31	575	10	0	#527	327
Internal Link Dist (ft)		452		967		434	631	
Turn Bay Length (ft)	250		255		360			175
Base Capacity (vph)	119	2979	82	2569	864	516	436	659
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	27
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.68	0.29	0.12	0.68	0.10	0.04	0.86	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	850	10	10	1750	90	10	0	10	375	0	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			0%			0%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (prot)	1787	5127		1770	5085	1583		1695			1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (perm)	1787	5127		1770	5085	1583		1695			1770	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	850	10	10	1750	90	10	0	10	375	0	525
RTOR Reduction (vph)	0	0	0	0	0	46	0	19	0	0	0	274
Lane Group Flow (vph)	200	860	0	10	1750	44	0	1	0	0	375	251
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases						2						3
Actuated Green, G (s)	10.0	80.2		2.8	73.0	73.0		4.2			34.8	34.8
Effective Green, g (s)	10.0	80.2		2.8	73.0	73.0		4.2			34.8	34.8
Actuated g/C Ratio	0.07	0.53		0.02	0.49	0.49		0.03			0.23	0.23
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0			3.0	3.0
Lane Grp Cap (vph)	119	2741		33	2474	770		47			410	367
v/s Ratio Prot	c0.11	0.17		0.01	c0.34			c0.00			c0.21	
v/s Ratio Perm						0.03						0.16
v/c Ratio	1.68	0.31		0.30	0.71	0.06		0.01			0.91	0.68
Uniform Delay, d1	70.0	19.5		72.6	30.1	20.3		70.9			56.2	52.6
Progression Factor	0.88	0.84		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	336.9	0.3		5.1	1.7	0.1		0.1			24.6	5.2
Delay (s)	398.7	16.7		77.8	31.9	20.5		71.0			80.7	57.8
Level of Service	F	B		E	C	C		E			F	E
Approach Delay (s)		88.7			31.6			71.0			67.3	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	56.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	850	10	250	1800	30	40	60	143	142	80
v/c Ratio	0.57	0.72	0.02	0.36	0.71	0.04	0.34	0.41	0.61	0.61	0.24
Control Delay	78.1	65.1	0.1	31.8	27.0	2.0	88.3	43.1	81.9	81.4	1.7
Queue Delay	0.0	0.0	0.0	2.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.1	65.1	0.1	34.4	27.3	2.0	88.3	43.1	81.9	81.4	1.7
Queue Length 50th (ft)	140	330	0	194	558	1	44	23	163	162	0
Queue Length 95th (ft)	205	391	0	333	708	13	93	78	253	250	0
Internal Link Dist (ft)		967			196			671		824	
Turn Bay Length (ft)	500		200						430		430
Base Capacity (vph)	436	1950	664	698	2610	856	373	384	449	452	520
Starvation Cap Reductn	0	0	0	332	256	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.44	0.02	0.68	0.76	0.04	0.11	0.16	0.32	0.31	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	850	10	250	1800	30	40	20	40	275	10	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			0%			-3%	
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3467	5136	1599	1752	5034	1567	1770	1676		1706	1716	1607
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3467	5136	1599	1752	5034	1567	1770	1676		1706	1716	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	850	10	250	1800	30	40	20	40	275	10	80
RTOR Reduction (vph)	0	0	8	0	0	15	0	36	0	0	0	69
Lane Group Flow (vph)	250	850	2	250	1800	15	40	24	0	143	142	11
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		8	8		3	3	
Permitted Phases			6			2						3
Actuated Green, G (s)	21.6	39.2	39.2	68.4	86.0	86.0	11.2	11.2		23.4	23.4	23.4
Effective Green, g (s)	21.6	39.2	39.2	68.4	86.0	86.0	11.2	11.2		23.4	23.4	23.4
Actuated g/C Ratio	0.13	0.23	0.23	0.40	0.50	0.50	0.07	0.07		0.14	0.14	0.14
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.5	3.0	3.0	3.0	3.0	3.0	4.0	4.0		3.0	3.0	3.0
Lane Grp Cap (vph)	437	1176	366	699	2528	787	115	109		233	234	219
v/s Ratio Prot	0.07	c0.17		0.14	c0.36		c0.02	0.01		c0.08	0.08	
v/s Ratio Perm			0.00			0.01						0.01
v/c Ratio	0.57	0.72	0.01	0.36	0.71	0.02	0.35	0.22		0.61	0.61	0.05
Uniform Delay, d1	70.4	61.0	51.0	36.0	33.0	21.4	76.5	75.8		69.6	69.6	64.2
Progression Factor	1.00	1.00	1.00	0.77	0.74	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	2.2	0.0	0.3	1.0	0.0	2.5	1.4		4.7	4.4	0.1
Delay (s)	72.4	63.2	51.0	28.2	25.5	21.4	79.0	77.2		74.4	74.0	64.3
Level of Service	E	E	D	C	C	C	E	E		E	E	E
Approach Delay (s)		65.2			25.8			77.9			72.0	
Approach LOS		E			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	171.2	Sum of lost time (s)	29.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	450	10	20	600	30	2175	1200
v/c Ratio	0.84	0.03	0.45	0.17	0.43	0.58	0.85
Control Delay	95.7	2.2	153.8	2.3	111.9	14.3	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.7	2.2	153.8	2.3	111.9	14.3	11.5
Queue Length 50th (ft)	301	0	27	21	39	508	258
Queue Length 95th (ft)	357	4	m#64	10	81	600	634
Internal Link Dist (ft)	1564			126		1018	
Turn Bay Length (ft)					315		
Base Capacity (vph)	643	355	44	3589	79	3722	1406
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.03	0.45	0.17	0.38	0.58	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	450	10	20	600	30	2175	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.91	1.00	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	1770	5085	1583
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	10	20	600	30	2175	1200
RTOR Reduction (vph)	0	8	0	0	0	0	261
Lane Group Flow (vph)	450	2	20	600	30	2175	939
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	31.4	34.4	3.0	139.7	6.9	143.6	143.6
Effective Green, g (s)	31.4	34.4	3.0	139.7	6.9	143.6	143.6
Actuated g/C Ratio	0.16	0.17	0.02	0.70	0.03	0.72	0.72
Clearance Time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	538	272	26	3551	61	3651	1136
v/s Ratio Prot	c0.13	0.00	0.01	0.12	c0.02	0.43	
v/s Ratio Perm		0.00					c0.59
v/c Ratio	0.84	0.01	0.77	0.17	0.49	0.60	0.83
Uniform Delay, d1	81.8	68.6	98.2	10.3	94.8	13.9	19.6
Progression Factor	1.00	1.00	1.28	0.21	1.00	1.00	1.00
Incremental Delay, d2	10.9	0.0	79.8	0.1	6.1	0.7	7.0
Delay (s)	92.7	68.6	205.6	2.2	100.9	14.6	26.5
Level of Service	F	E	F	A	F	B	C
Approach Delay (s)	92.1			8.8		19.6	
Approach LOS	F			A		B	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	951	3451	380	142	134	132
v/c Ratio	0.53	0.23	0.77	0.27	0.74	0.52	0.34
Control Delay	87.6	4.3	5.6	0.4	98.1	27.1	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.6	4.3	5.6	0.4	98.1	27.1	31.6
Queue Length 50th (ft)	81	82	168	0	173	37	72
Queue Length 95th (ft)	120	119	454	m1	251	115	135
Internal Link Dist (ft)		1701	1154			995	
Turn Bay Length (ft)	575				435		
Base Capacity (vph)	256	4132	4497	1405	420	444	430
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.23	0.77	0.27	0.34	0.30	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	125	875	0	0	0	3175	350	0	0	0	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Lane Util. Factor	0.97	0.91				0.86	1.00				0.95	0.91
Frt	1.00	1.00				1.00	0.85				1.00	0.87
Flt Protected	0.95	1.00				1.00	1.00				0.95	0.99
Satd. Flow (prot)	3433	5085				6408	1583				1681	1469
Flt Permitted	0.95	1.00				1.00	1.00				0.95	0.99
Satd. Flow (perm)	3433	5085				6408	1583				1681	1469
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	951	0	0	0	3451	380	0	0	0	163	0
RTOR Reduction (vph)	0	0	0	0	0	0	70	0	0	0	0	91
Lane Group Flow (vph)	136	951	0	0	0	3451	310	0	0	0	142	43
Turn Type	Prot	NA		custom		NA	pm+ov	Split			Split	NA
Protected Phases	1	6				2	4	3	3		4	4
Permitted Phases				5			2					
Actuated Green, G (s)	13.5	146.3				126.3	147.0				20.7	20.7
Effective Green, g (s)	13.5	146.3				126.3	147.0				20.7	20.7
Actuated g/C Ratio	0.08	0.81				0.70	0.82				0.11	0.11
Clearance Time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Vehicle Extension (s)	3.0	4.0				4.0	3.0				3.0	3.0
Lane Grp Cap (vph)	257	4132				4496	1349				193	168
v/s Ratio Prot	c0.04	0.19				c0.54	0.03				c0.08	0.03
v/s Ratio Perm							0.17					
v/c Ratio	0.53	0.23				0.77	0.23				0.74	0.26
Uniform Delay, d1	80.2	3.9				17.4	3.7				77.0	72.6
Progression Factor	1.00	1.00				0.26	0.13				1.00	1.00
Incremental Delay, d2	2.0	0.1				0.9	0.1				13.6	0.8
Delay (s)	82.2	4.0				5.4	0.5				90.6	73.4
Level of Service	F	A				A	A				F	E
Approach Delay (s)		13.8				4.9			0.0			75.8
Approach LOS		B				A			A			E

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	225
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	0.95
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1504
Flt Permitted	1.00
Satd. Flow (perm)	1504
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	245
RTOR Reduction (vph)	49
Lane Group Flow (vph)	83
Turn Type	pm+ov
Protected Phases	1
Permitted Phases	4
Actuated Green, G (s)	34.2
Effective Green, g (s)	34.2
Actuated g/C Ratio	0.19
Clearance Time (s)	6.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	340
v/s Ratio Prot	0.02
v/s Ratio Perm	0.04
v/c Ratio	0.24
Uniform Delay, d1	61.9
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	62.3
Level of Service	E
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	875	76	3016	43	22	22	22	163	109	1033
v/c Ratio	0.98	0.26	0.62	0.68	0.03	0.25	0.24	0.12	0.71	0.88	0.37
Control Delay	142.1	10.6	107.5	8.8	0.4	88.7	87.8	1.4	99.8	134.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.1	10.6	107.5	8.8	0.4	88.7	87.8	1.4	99.8	134.1	0.4
Queue Length 50th (ft)	102	117	95	278	0	26	26	0	99	130	0
Queue Length 95th (ft)	#173	132	m119	310	m1	59	59	0	#144	#257	0
Internal Link Dist (ft)		1154		740			701			434	
Turn Bay Length (ft)	800		415		350	195		195	240		300
Base Capacity (vph)	249	3411	147	4446	1231	422	445	461	228	124	2787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.26	0.52	0.68	0.03	0.05	0.05	0.05	0.71	0.88	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	775	30	70	2775	40	20	20	20	150	100	950
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.94	0.91		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	5057		1770	6408	1583	1770	1863	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	5057		1770	6408	1583	1770	1863	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	842	33	76	3016	43	22	22	22	163	109	1033
RTOR Reduction (vph)	0	1	0	0	0	11	0	0	21	0	0	0
Lane Group Flow (vph)	245	874	0	76	3016	32	22	22	1	163	109	1033
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Free
Protected Phases	1	6		5	2	8	7	7		8	8	
Permitted Phases						2			7			Free
Actuated Green, G (s)	9.0	120.0		12.5	123.5	135.5	7.5	7.5	7.5	12.0	12.0	180.0
Effective Green, g (s)	9.0	120.0		12.5	123.5	135.5	7.5	7.5	7.5	12.0	12.0	180.0
Actuated g/C Ratio	0.05	0.67		0.07	0.69	0.75	0.04	0.04	0.04	0.07	0.07	1.00
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	249	3371		122	4396	1191	73	77	65	228	124	2787
v/s Ratio Prot	c0.05	0.17		0.04	c0.47	0.00	0.01	0.01		0.05	c0.06	
v/s Ratio Perm						0.02			0.00			c0.37
v/c Ratio	0.98	0.26		0.62	0.69	0.03	0.30	0.29	0.01	0.71	0.88	0.37
Uniform Delay, d1	85.4	12.1		81.5	16.8	5.6	83.7	83.7	82.7	82.3	83.3	0.0
Progression Factor	1.09	0.85		1.16	0.50	1.56	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	51.7	0.2		5.6	0.5	0.0	3.2	2.8	0.1	10.8	46.5	0.4
Delay (s)	144.7	10.5		100.4	8.8	8.8	86.9	86.4	82.8	93.2	129.8	0.4
Level of Service	F	B		F	A	A	F	F	F	F	F	A
Approach Delay (s)		39.9			11.1			85.4			22.8	
Approach LOS		D			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	33	870	2500	435	734	571
v/c Ratio	0.35	0.24	0.76	0.17	0.66	0.74
Control Delay	111.5	8.0	5.6	1.4	67.2	65.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.5	8.0	5.6	1.4	67.2	65.8
Queue Length 50th (ft)	20	79	331	33	284	345
Queue Length 95th (ft)	43	120	342	m37	333	426
Internal Link Dist (ft)		3908	1326		784	
Turn Bay Length (ft)	600			800		550
Base Capacity (vph)	95	3573	3302	2557	1108	768
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.24	0.76	0.17	0.66	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	800	2300	400	675	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	0.97	0.91	0.91	0.88	0.94	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	5085	5085	2787	4990	2787
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	5085	5085	2787	4990	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	870	2500	435	734	571
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	33	870	2500	435	734	571
Turn Type	Prot	NA	NA	pt+ov	NA	pm+ov
Protected Phases	1	6	2	2 4	4	1
Permitted Phases						4
Actuated Green, G (s)	4.0	126.5	115.5	162.0	40.0	44.0
Effective Green, g (s)	4.0	126.5	115.5	162.0	40.0	44.0
Actuated g/C Ratio	0.02	0.70	0.64	0.90	0.22	0.24
Clearance Time (s)	7.0	6.5	6.5		7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0		3.5	3.0
Lane Grp Cap (vph)	76	3573	3262	2508	1108	789
v/s Ratio Prot	0.01	0.17	c0.49	0.16	0.15	c0.02
v/s Ratio Perm						0.19
v/c Ratio	0.43	0.24	0.77	0.17	0.66	0.72
Uniform Delay, d1	86.9	9.6	22.7	1.1	63.8	62.4
Progression Factor	1.18	0.82	0.21	1.30	1.00	1.00
Incremental Delay, d2	3.8	0.2	1.0	0.0	1.6	3.3
Delay (s)	106.6	8.0	5.7	1.4	65.4	65.7
Level of Service	F	A	A	A	E	E
Approach Delay (s)		11.6	5.1		65.5	
Approach LOS		B	A		E	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	1359	217	43	1929	87	509	253	98	11	11
v/c Ratio	0.19	0.60	0.18	0.47	0.77	0.11	0.83	0.82	0.34	0.04	0.03
Control Delay	88.8	39.3	29.6	99.2	41.7	3.5	82.6	90.9	67.7	61.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.8	39.3	29.6	99.2	41.7	3.5	82.6	90.9	67.7	61.0	0.2
Queue Length 50th (ft)	13	485	115	50	656	0	318	313	102	11	0
Queue Length 95th (ft)	m31	525	153	98	819	27	391	#437	167	32	0
Internal Link Dist (ft)		1326			2726			1066		653	
Turn Bay Length (ft)	345			225		500	1000				125
Base Capacity (vph)	57	2250	1233	99	2492	826	662	332	292	307	352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.60	0.18	0.43	0.77	0.11	0.77	0.76	0.34	0.04	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1250	200	40	1775	80	650	30	20	90	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.88	1.00	0.91	1.00	0.91	0.91		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	2787	1770	5085	1583	3221	1610		1593	1676	1478
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	2787	1770	5085	1583	3221	1610		1593	1676	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1359	217	43	1929	87	707	33	22	98	11	11
RTOR Reduction (vph)	0	0	0	0	0	46	0	2	0	0	0	9
Lane Group Flow (vph)	11	1359	217	43	1929	41	509	251	0	98	11	2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6						3
Actuated Green, G (s)	2.0	78.3	78.3	8.0	84.3	84.3	34.2	34.2		33.0	33.0	33.0
Effective Green, g (s)	2.0	78.3	78.3	8.0	84.3	84.3	34.2	34.2		33.0	33.0	33.0
Actuated g/C Ratio	0.01	0.43	0.43	0.04	0.47	0.47	0.19	0.19		0.18	0.18	0.18
Clearance Time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	19	2211	1212	78	2381	741	611	305		292	307	270
v/s Ratio Prot	0.01	0.27		c0.02	c0.38		c0.16	0.16		c0.06	0.01	
v/s Ratio Perm			0.08			0.03						0.00
v/c Ratio	0.58	0.61	0.18	0.55	0.81	0.05	0.83	0.82		0.34	0.04	0.01
Uniform Delay, d1	88.6	39.2	31.2	84.2	41.0	26.1	70.2	70.0		64.0	60.4	60.1
Progression Factor	0.96	0.97	0.91	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.3	1.2	0.3	10.0	3.1	0.1	9.9	17.0		3.1	0.2	0.1
Delay (s)	124.0	39.1	28.8	94.2	44.1	26.3	80.1	87.0		67.0	60.6	60.2
Level of Service	F	D	C	F	D	C	F	F		E	E	E
Approach Delay (s)		38.3			44.4			82.4			65.8	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.5
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	NWL	NWT
Lane Group Flow (vph)	76	1196	65	76	1603	353	571	185	435	310
v/c Ratio	0.45	0.52	0.08	0.44	0.69	0.39	0.87	0.39	0.62	0.88
Control Delay	87.0	35.4	0.2	93.8	14.9	3.0	63.0	20.3	43.6	70.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.0	35.4	0.2	93.8	14.9	3.0	63.0	20.3	43.6	70.1
Queue Length 50th (ft)	43	350	0	43	205	26	268	59	178	231
Queue Length 95th (ft)	74	440	0	76	299	41	322	124	201	331
Internal Link Dist (ft)		620			1066			236		883
Turn Bay Length (ft)	410		500	410		1000	200		200	
Base Capacity (vph)	175	2311	806	176	2313	912	669	577	702	448
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.52	0.08	0.43	0.69	0.39	0.85	0.32	0.62	0.69

Intersection Summary

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	70	1100	60	70	1475	325	525	20	150	400	10	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1617		3433	1593	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.11	1.00		0.64	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	415	1617		2316	1593	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1196	65	76	1603	353	571	22	163	435	11	299
RTOR Reduction (vph)	0	0	35	0	0	192	0	91	0	0	90	0
Lane Group Flow (vph)	76	1196	30	76	1603	161	571	94	0	435	220	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	8.4	77.3	77.3	8.5	77.4	77.4	63.2	40.2		43.8	27.8	
Effective Green, g (s)	8.4	77.3	77.3	8.5	77.4	77.4	63.2	40.2		43.8	27.8	
Actuated g/C Ratio	0.05	0.45	0.45	0.05	0.46	0.46	0.37	0.24		0.26	0.16	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	169	2312	719	171	2315	720	658	382		701	260	
v/s Ratio Prot	c0.02	0.24		0.02	c0.32		c0.14	0.06		0.06	0.14	
v/s Ratio Perm			0.02			0.10	c0.18			0.10		
v/c Ratio	0.45	0.52	0.04	0.44	0.69	0.22	0.87	0.25		0.62	0.84	
Uniform Delay, d1	78.6	33.0	25.8	78.5	36.8	28.1	50.6	52.6		53.7	69.0	
Progression Factor	1.00	1.00	1.00	1.10	0.35	0.63	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.8	0.1	1.7	1.6	0.7	11.7	0.3		1.7	21.5	
Delay (s)	80.5	33.9	25.9	87.9	14.3	18.3	62.3	53.0		55.4	90.5	
Level of Service	F	C	C	F	B	B	E	D		E	F	
Approach Delay (s)		36.1			17.8			60.0			70.0	
Approach LOS		D			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT
Lane Group Flow (vph)	2038	2038
v/c Ratio	0.39	0.41
Control Delay	0.2	1.9
Queue Delay	0.0	0.0
Total Delay	0.2	1.9
Queue Length 50th (ft)	0	43
Queue Length 95th (ft)	0	60
Internal Link Dist (ft)	1066	1427
Turn Bay Length (ft)		
Base Capacity (vph)	5162	4984
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.41

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			
Volume (vph)	0	1875	1875	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		-3%	4%		0%	
Total Lost time (s)		6.5	6.5			
Lane Util. Factor		0.91	0.91			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		5162	4984			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		5162	4984			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2038	2038	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2038	2038	0	0	0
Turn Type	Prot	NA	NA	Perm		Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		170.0	170.0			
Effective Green, g (s)		170.0	170.0			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		6.5	6.5			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		5162	4984			
v/s Ratio Prot		0.39	c0.41			
v/s Ratio Perm						
v/c Ratio		0.39	0.41			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.2			
Delay (s)		0.2	0.2			
Level of Service		A	A			
Approach Delay (s)		0.2	0.2		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	0.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

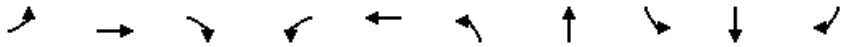
Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	270	250	375	900	300	650
v/c Ratio	0.90	0.87	0.59	0.71	0.82	0.33
Control Delay	91.1	89.6	5.0	43.1	44.8	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.1	89.6	5.0	43.1	44.8	19.4
Queue Length 50th (ft)	253	239	0	395	179	186
Queue Length 95th (ft)	#409	#377	17	486	292	230
Internal Link Dist (ft)	979		481	906		768
Turn Bay Length (ft)					250	
Base Capacity (vph)	316	306	653	1270	405	1958
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.82	0.57	0.71	0.74	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	150	50	250	0	375	0	600	300	300	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00		1.00	1.00			0.95		1.00	0.95	
Frt		0.97		1.00	0.85			0.95		1.00	1.00	
Flt Protected		0.99		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1793		1770	1583			3362		1770	3539	
Flt Permitted		0.99		0.95	1.00			1.00		0.14	1.00	
Satd. Flow (perm)		1793		1770	1583			3362		261	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	150	50	250	0	375	0	600	300	300	650	0
RTOR Reduction (vph)	0	6	0	0	314	0	0	39	0	0	0	0
Lane Group Flow (vph)	0	264	0	250	61	0	0	861	0	300	650	0
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		24.7		24.3	24.3			54.9		83.0	83.0	
Effective Green, g (s)		24.7		24.3	24.3			54.9		83.0	83.0	
Actuated g/C Ratio		0.16		0.16	0.16			0.37		0.55	0.55	
Clearance Time (s)		6.0		6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		295		286	256			1230		366	1958	
v/s Ratio Prot		c0.15		c0.14	0.04			0.26		c0.12	0.18	
v/s Ratio Perm										c0.33		
v/c Ratio		0.90		0.87	0.24			0.70		0.82	0.33	
Uniform Delay, d1		61.4		61.4	54.8			40.5		30.0	18.3	
Progression Factor		1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2		27.3		24.2	0.5			3.3		13.4	0.5	
Delay (s)		88.6		85.6	55.3			43.9		43.3	18.8	
Level of Service		F		F	E			D		D	B	
Approach Delay (s)		88.6			67.4			43.9			26.5	
Approach LOS		F			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	245	1603	353	33	1364	435	527	190	245	109
v/c Ratio	0.94	1.14	0.43	0.63	1.02	0.50	1.14	0.36	0.86	0.28
Control Delay	125.4	127.3	21.5	126.8	90.1	57.4	142.0	65.9	96.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	125.4	127.3	21.5	126.8	90.1	57.4	142.0	65.9	96.6	1.7
Queue Length 50th (ft)	288	~1148	125	37	~586	219	~706	97	267	0
Queue Length 95th (ft)	#463	#1287	242	#97	#684	280	#960	138	#388	0
Internal Link Dist (ft)		937			1943		2110		622	
Turn Bay Length (ft)	485		510	610		160		250		300
Base Capacity (vph)	260	1407	814	52	1336	866	461	585	317	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.14	0.43	0.63	1.02	0.50	1.14	0.32	0.77	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	1475	325	30	1175	80	400	425	60	175	225	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.97	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	5037		3433	1828		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	5037		3433	1828		3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	1603	353	33	1277	87	435	462	65	190	245	109
RTOR Reduction (vph)	0	0	188	0	4	0	0	0	0	0	0	92
Lane Group Flow (vph)	245	1603	165	33	1360	0	435	527	0	190	245	17
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	7		3	3		6	6	
Permitted Phases			2									6
Actuated Green, G (s)	26.6	66.0	66.0	4.0	43.4		42.9	42.9		26.1	26.1	26.1
Effective Green, g (s)	26.6	66.0	66.0	4.0	43.4		42.9	42.9		26.1	26.1	26.1
Actuated g/C Ratio	0.16	0.39	0.39	0.02	0.26		0.25	0.25		0.15	0.15	0.15
Clearance Time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	276	1373	614	41	1285		866	461		527	286	243
v/s Ratio Prot	0.14	c0.45		0.02	c0.27		0.13	c0.29		0.06	c0.13	
v/s Ratio Perm			0.10									0.01
v/c Ratio	0.89	1.17	0.27	0.80	1.06		0.50	1.14		0.36	0.86	0.07
Uniform Delay, d1	70.2	52.0	35.5	82.6	63.3		54.4	63.5		64.5	70.1	61.6
Progression Factor	1.21	1.29	3.32	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	26.0	83.2	1.0	69.0	42.0		0.5	87.4		0.4	21.5	0.1
Delay (s)	111.0	150.1	119.1	151.6	105.3		54.9	151.0		64.9	91.6	61.7
Level of Service	F	F	F	F	F		D	F		E	F	E
Approach Delay (s)		140.7			106.4			107.5			76.3	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	118.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	70	500	150	600	475	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	500	150	600	475	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1375	475	475			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1375	475	475			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	49	15	86			
cM capacity (veh/h)	138	590	1087			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	570	150	600	475	70
Volume Left	70	150	0	0	0
Volume Right	500	0	0	0	70
cSH	421	1087	1700	1700	1700
Volume to Capacity	1.35	0.14	0.35	0.28	0.04
Queue Length 95th (ft)	667	12	0	0	0
Control Delay (s)	201.1	8.8	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	201.1	1.8		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	62.2			
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	30	1200	50	200	3600	90	20	10	125	125	10	80
v/c Ratio	0.75	0.38	0.05	0.84	0.91	0.07	0.12	0.05	0.42	0.79	0.05	0.27
Control Delay	180.0	22.3	19.3	98.1	25.2	2.8	85.2	82.4	15.1	125.9	82.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.0	22.3	19.3	98.1	25.2	2.8	85.2	82.4	15.1	125.9	82.4	2.6
Queue Length 50th (ft)	44	307	28	227	1437	8	27	13	0	180	13	0
Queue Length 95th (ft)	#117	416	61	275	1724	30	58	35	70	257	35	3
Internal Link Dist (ft)		1472			1818			850			1101	
Turn Bay Length (ft)	520		380	380		400	55		65	270		280
Base Capacity (vph)	40	3161	980	305	3944	1237	248	330	383	239	330	382
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.38	0.05	0.66	0.91	0.07	0.08	0.03	0.33	0.52	0.03	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1200	50	200	3600	90	20	10	125	125	10	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	11	12	12
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1577	1770	5085	1577	1770	1863	1583	1711	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1770	5085	1577	1770	5085	1577	1399	1863	1583	1352	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	1200	50	200	3600	90	20	10	125	125	10	80
RTOR Reduction (vph)	0	0	0	0	0	15	0	0	110	0	0	71
Lane Group Flow (vph)	30	1200	50	200	3600	75	20	10	15	125	10	9
Bus Blockages (#/hr)	0	0	1	0	0	1	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1 3	6			4			8	
Permitted Phases			2			6	4		4	8		8
Actuated Green, G (s)	4.0	135.4	135.4	30.9	169.3	169.3	25.7	25.7	25.7	25.7	25.7	25.7
Effective Green, g (s)	4.0	135.4	135.4	30.9	169.3	169.3	25.7	25.7	25.7	25.7	25.7	25.7
Actuated g/C Ratio	0.02	0.62	0.62	0.14	0.77	0.77	0.12	0.12	0.12	0.12	0.12	0.12
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0		4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	32	3129	970	248	3913	1213	163	217	184	157	217	184
v/s Ratio Prot	0.02	0.24		c0.11	c0.71			0.01			0.01	
v/s Ratio Perm			0.03			0.05	0.01		0.01	c0.09		0.01
v/c Ratio	0.94	0.38	0.05	0.81	0.92	0.06	0.12	0.05	0.08	0.80	0.05	0.05
Uniform Delay, d1	107.9	21.3	16.8	91.7	20.0	6.1	87.0	86.3	86.6	94.6	86.3	86.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.6	0.4	0.1	16.3	4.7	0.1	0.3	0.1	0.2	23.7	0.1	0.1
Delay (s)	238.5	21.6	16.9	108.0	24.7	6.2	87.4	86.4	86.8	118.3	86.4	86.4
Level of Service	F	C	B	F	C	A	F	F	F	F	F	F
Approach Delay (s)		26.5			28.5			86.8			105.0	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	312	313	40	225	1125	675	425
v/c Ratio	0.75	0.75	0.06	0.45	0.48	0.36	0.31
Control Delay	69.4	69.5	0.5	18.5	20.0	14.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.4	69.5	0.5	18.5	20.0	14.0	0.8
Queue Length 50th (ft)	341	342	0	96	336	85	0
Queue Length 95th (ft)	413	414	3	177	516	236	0
Internal Link Dist (ft)		655			1415	1227	
Turn Bay Length (ft)	515		320	330			260
Base Capacity (vph)	554	554	741	577	2358	1895	1473
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.56	0.05	0.39	0.48	0.36	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	625	0	40	0	0	0	225	1125	0	0	675	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0				7.0	7.5			7.5	7.0
Lane Util. Factor	0.95	0.95	1.00				1.00	0.95			0.95	1.00
Frt	1.00	1.00	0.85				1.00	1.00			1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00			1.00	1.00
Satd. Flow (prot)	1681	1681	1583				1770	3539			3539	1583
Flt Permitted	0.95	0.95	1.00				0.32	1.00			1.00	1.00
Satd. Flow (perm)	1681	1681	1583				594	3539			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	625	0	40	0	0	0	225	1125	0	0	675	425
RTOR Reduction (vph)	0	0	25	0	0	0	0	0	0	0	0	92
Lane Group Flow (vph)	312	313	15	0	0	0	225	1125	0	0	675	333
Turn Type	Split	NA	pt+ov	Split			pm+pt	NA		Perm	NA	pm+ov
Protected Phases	4	4	4 5	3	3		5	2			6	4
Permitted Phases							2			6		6
Actuated Green, G (s)	42.2	42.2	64.5				113.3	113.3			91.0	133.2
Effective Green, g (s)	42.2	42.2	64.5				113.3	113.3			91.0	133.2
Actuated g/C Ratio	0.25	0.25	0.38				0.67	0.67			0.54	0.78
Clearance Time (s)	7.0	7.0					7.0	7.5			7.5	7.0
Vehicle Extension (s)	5.0	5.0					4.0	4.0			4.0	5.0
Lane Grp Cap (vph)	417	417	600				501	2358			1894	1240
v/s Ratio Prot	0.19	c0.19	0.01				0.04	c0.32			0.19	0.07
v/s Ratio Perm							0.26					0.14
v/c Ratio	0.75	0.75	0.03				0.45	0.48			0.36	0.27
Uniform Delay, d1	59.0	59.0	33.1				12.4	13.9			22.7	5.0
Progression Factor	1.00	1.00	1.00				1.29	1.27			0.54	0.61
Incremental Delay, d2	8.6	8.8	0.0				0.8	0.7			0.5	0.2
Delay (s)	67.6	67.8	33.1				16.8	18.2			12.8	3.3
Level of Service	E	E	C				B	B			B	A
Approach Delay (s)		65.6			0.0			18.0			9.1	
Approach LOS		E			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	104	106	350	50	20	50	1625	10	850	900
v/c Ratio	0.44	0.44	0.73	0.52	0.11	0.12	0.68	0.06	0.38	0.57
Control Delay	72.0	72.2	36.9	96.7	1.3	6.1	16.1	4.5	6.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	72.0	72.2	36.9	96.7	1.3	6.1	16.1	4.5	6.8	0.9
Queue Length 50th (ft)	113	115	176	55	0	8	462	1	138	0
Queue Length 95th (ft)	176	180	286	106	0	15	659	m1	165	0
Internal Link Dist (ft)		625		38			1227		378	
Turn Bay Length (ft)	400		540			510		150		
Base Capacity (vph)	309	311	492	106	184	426	2385	175	2219	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	824	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.34	0.71	0.47	0.11	0.12	0.68	0.06	0.61	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	10	350	30	20	20	50	1625	0	10	850	900
Ideal Flow (vphpl)	2050	2050	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1814	1827	1583		1808	1583	1770	3539		1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.97	1.00	0.27	1.00		0.09	1.00	1.00
Satd. Flow (perm)	1814	1827	1583		1808	1583	505	3539		167	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	10	350	30	20	20	50	1625	0	10	850	900
RTOR Reduction (vph)	0	0	149	0	0	19	0	0	0	0	0	0
Lane Group Flow (vph)	104	106	201	0	50	1	50	1625	0	10	850	900
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	pm+pt	NA		pm+pt	NA	Free
Protected Phases	4	4	5	3	3	1	5	2		1	6	
Permitted Phases			4			3	2			6		Free
Actuated Green, G (s)	22.5	22.5	30.5		7.7	10.5	117.0	109.0		106.6	103.8	170.0
Effective Green, g (s)	22.5	22.5	30.5		7.7	10.5	117.0	109.0		106.6	103.8	170.0
Actuated g/C Ratio	0.13	0.13	0.18		0.05	0.06	0.69	0.64		0.63	0.61	1.00
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	240	241	349		81	97	407	2269		131	2160	1583
v/s Ratio Prot	0.06	0.06	c0.03		0.03	0.00	0.01	c0.46		0.00	0.24	
v/s Ratio Perm			0.10			0.00	0.08			0.05		c0.57
v/c Ratio	0.43	0.44	0.57		0.62	0.01	0.12	0.72		0.08	0.39	0.57
Uniform Delay, d1	67.9	67.9	63.8		79.7	74.9	9.8	20.2		17.5	17.0	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.57	0.72		0.39	0.33	1.00
Incremental Delay, d2	1.3	1.3	2.3		13.2	0.1	0.1	1.7		0.1	0.3	0.9
Delay (s)	69.1	69.2	66.1		92.9	74.9	5.7	16.3		6.9	6.0	0.9
Level of Service	E	E	E		F	E	A	B		A	A	A
Approach Delay (s)		67.3			87.8			16.0			3.4	
Approach LOS		E			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Group Flow (vph)	1275	725	950	2125	975
v/c Ratio	1.16	1.06	1.61	0.70	1.67
Control Delay	141.1	76.6	319.7	27.0	340.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	141.1	76.6	319.7	27.0	340.9
Queue Length 50th (ft)	~648	~510	~1602	623	~1612
Queue Length 95th (ft)	#746	#772	#1868	670	#1884
Internal Link Dist (ft)	837			1008	920
Turn Bay Length (ft)			425		
Base Capacity (vph)	1101	684	590	3022	585
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.16	1.06	1.61	0.70	1.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑↑						✣	
Volume (vph)	0	1275	725	950	2125	0	0	0	0	225	0	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0	8.0	8.0						7.0	
Lane Util. Factor		0.91	1.00	1.00	0.91						1.00	
Frt		1.00	0.85	1.00	1.00						0.90	
Flt Protected		1.00	1.00	0.95	1.00						0.99	
Satd. Flow (prot)		5085	1583	1770	5085						1650	
Flt Permitted		1.00	1.00	0.95	1.00						0.99	
Satd. Flow (perm)		5085	1583	1770	5085						1650	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1275	725	950	2125	0	0	0	0	225	0	750
RTOR Reduction (vph)	0	0	342	0	0	0	0	0	0	0	54	0
Lane Group Flow (vph)	0	1275	383	950	2125	0	0	0	0	0	921	0
Turn Type		NA	Perm	Prot	NA					Perm	NA	
Protected Phases		2		1	6						8	
Permitted Phases			2							8		
Actuated Green, G (s)		39.0	39.0	60.0	107.0						58.0	
Effective Green, g (s)		39.0	39.0	60.0	107.0						58.0	
Actuated g/C Ratio		0.22	0.22	0.33	0.59						0.32	
Clearance Time (s)		8.0	8.0	8.0	8.0						7.0	
Vehicle Extension (s)		3.0	3.0	4.0	3.0						4.0	
Lane Grp Cap (vph)		1101	342	590	3022						531	
v/s Ratio Prot		c0.25		c0.54	0.42							
v/s Ratio Perm			0.24								0.56	
v/c Ratio		1.16	1.12	1.61	0.70						1.74	
Uniform Delay, d1		70.5	70.5	60.0	25.4						61.0	
Progression Factor		1.00	1.00	1.00	1.00						1.00	
Incremental Delay, d2		81.6	85.6	282.4	1.4						338.7	
Delay (s)		152.1	156.1	342.4	26.8						399.7	
Level of Service		F	F	F	C						F	
Approach Delay (s)		153.5			124.3			0.0			399.7	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	178.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	175.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	88	125	300	525	1100	250
v/c Ratio	0.54	0.55	0.47	0.26	0.81	0.54	0.12
Control Delay	80.6	81.0	15.6	57.3	22.4	4.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	80.6	81.0	15.6	57.3	22.4	5.0	0.6
Queue Length 50th (ft)	93	94	0	77	85	102	2
Queue Length 95th (ft)	151	152	63	110	#307	287	2
Internal Link Dist (ft)		906		517			268
Turn Bay Length (ft)			430		60		
Base Capacity (vph)	430	430	498	1171	646	2252	2321
Starvation Cap Reductn	0	0	0	0	0	600	0
Spillback Cap Reductn	0	0	0	36	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.25	0.26	0.81	0.67	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	0	125	0	0	0	0	300	525	1100	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					7.0	7.0	7.0	7.0	
Lane Util. Factor	0.95	0.95	1.00					0.86	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					6408	1583	3433	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					6408	1583	3433	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	0	125	0	0	0	0	300	525	1100	250	0
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	357	0	0	0
Lane Group Flow (vph)	87	88	12	0	0	0	0	300	168	1100	250	0
Turn Type	Split	NA	Perm					NA	Perm	Split	NA	
Protected Phases	2	2						1		6 8	6 8	
Permitted Phases			2						1			
Actuated Green, G (s)	15.2	15.2	15.2					29.2	29.2	94.6	94.6	
Effective Green, g (s)	15.2	15.2	15.2					29.2	29.2	94.6	94.6	
Actuated g/C Ratio	0.09	0.09	0.09					0.18	0.18	0.59	0.59	
Clearance Time (s)	7.0	7.0	7.0					7.0	7.0			
Vehicle Extension (s)	3.0	3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)	159	159	150					1169	288	2029	2092	
v/s Ratio Prot	0.05	c0.05						0.05		c0.32	0.07	
v/s Ratio Perm			0.01						c0.11			
v/c Ratio	0.55	0.55	0.08					0.26	0.58	0.54	0.12	
Uniform Delay, d1	69.1	69.2	66.0					56.1	59.8	19.7	14.4	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.18	0.03	
Incremental Delay, d2	3.8	4.1	0.2					0.2	3.5	0.3	0.0	
Delay (s)	72.9	73.3	66.2					56.3	63.3	3.9	0.5	
Level of Service	E	E	E					E	E	A	A	
Approach Delay (s)		70.2			0.0			60.8			3.2	
Approach LOS		E			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

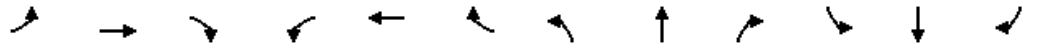
c Critical Lane Group

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	10	10	1350	600	400	1300	575
v/c Ratio	0.04	0.04	0.85	0.54	0.35	0.52	0.65
Control Delay	53.3	53.3	6.0	29.7	32.6	27.5	8.8
Queue Delay	0.0	0.0	0.0	0.3	0.2	0.0	0.1
Total Delay	53.3	53.3	6.0	30.0	32.7	27.5	8.9
Queue Length 50th (ft)	9	9	0	117	91	187	76
Queue Length 95th (ft)	28	28	0	104	86	258	118
Internal Link Dist (ft)		774			268	733	
Turn Bay Length (ft)	460		450				220
Base Capacity (vph)	367	367	1583	1657	1708	2522	881
Starvation Cap Reductn	0	0	0	477	601	0	27
Spillback Cap Reductn	0	0	0	0	0	64	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.85	0.51	0.36	0.53	0.67

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	1350	600	400	0	0	1300	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	4.0	7.0	7.0			7.0	7.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.95			0.86	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1681	1583	3433	3539			6408	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1681	1583	3433	3539			6408	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	20	0	1350	600	400	0	0	1300	575
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	258
Lane Group Flow (vph)	0	0	0	10	10	1350	600	400	0	0	1300	317
Turn Type				Split	NA	Free	Split	NA			NA	Perm
Protected Phases				8	8		1 2	1 2			6	
Permitted Phases						Free						6
Actuated Green, G (s)				24.5	24.5	160.0	51.4	51.4			63.1	63.1
Effective Green, g (s)				24.5	24.5	160.0	51.4	51.4			63.1	63.1
Actuated g/C Ratio				0.15	0.15	1.00	0.32	0.32			0.39	0.39
Clearance Time (s)				7.0	7.0						7.0	7.0
Vehicle Extension (s)				3.0	3.0						3.0	3.0
Lane Grp Cap (vph)				257	257	1583	1102	1136			2527	624
v/s Ratio Prot				0.01	0.01		0.17	0.11			0.20	
v/s Ratio Perm						c0.85						0.20
v/c Ratio				0.04	0.04	0.85	0.54	0.35			0.51	0.51
Uniform Delay, d1				57.7	57.7	0.0	44.7	41.6			36.8	36.7
Progression Factor				1.00	1.00	1.00	0.62	0.77			0.70	0.56
Incremental Delay, d2				0.1	0.1	6.0	0.7	0.3			0.5	2.2
Delay (s)				57.8	57.8	6.0	28.5	32.1			26.4	22.7
Level of Service				E	E	A	C	C			C	C
Approach Delay (s)		0.0			6.8			30.0			25.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	650	1350	900	125	1175	125	775	350	150	325	400	650
v/c Ratio	1.32	1.02	1.06	1.28	1.15	0.22	1.31	0.35	0.27	0.79	0.48	1.21
Control Delay	212.4	82.8	75.0	240.3	126.2	9.4	206.1	52.6	6.6	91.5	62.0	147.2
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	212.4	82.8	75.0	240.3	126.3	9.4	206.1	52.6	6.6	91.5	62.0	147.2
Queue Length 50th (ft)	~508	~881	~838	~190	~844	16	~604	175	0	194	217	~724
Queue Length 95th (ft)	#639	#1020	#1107	m#333	#986	m59	#739	228	52	251	275	#981
Internal Link Dist (ft)		1623			621			1129			657	
Turn Bay Length (ft)	560			330			415		305	365		275
Base Capacity (vph)	493	1330	852	98	1022	563	591	1012	564	457	825	537
Starvation Cap Reductn	0	0	0	0	20	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	1.02	1.06	1.28	1.17	0.22	1.31	0.35	0.27	0.71	0.48	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	650	1350	900	125	1175	125	775	350	150	325	400	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			0%	
Total Lost time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3416	3522	1575	1770	3539	1577	3433	3539	1577	3433	3539	1577
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3416	3522	1575	1770	3539	1577	3433	3539	1577	3433	3539	1577
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	650	1350	900	125	1175	125	775	350	150	325	400	650
RTOR Reduction (vph)	0	0	258	0	0	89	0	0	107	0	0	169
Lane Group Flow (vph)	650	1350	642	125	1175	36	775	350	43	325	400	481
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	1	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	26.0	68.0	68.0	10.0	52.0	52.0	31.0	51.5	51.5	21.5	42.0	42.0
Effective Green, g (s)	26.0	68.0	68.0	10.0	52.0	52.0	31.0	51.5	51.5	21.5	42.0	42.0
Actuated g/C Ratio	0.14	0.38	0.38	0.06	0.29	0.29	0.17	0.29	0.29	0.12	0.23	0.23
Clearance Time (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	4.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	493	1330	595	98	1022	455	591	1012	451	410	825	367
v/s Ratio Prot	c0.19	0.38		0.07	c0.33		c0.23	0.10		0.09	0.11	
v/s Ratio Perm			0.41			0.02			0.03			c0.30
v/c Ratio	1.32	1.02	1.08	1.28	1.15	0.08	1.31	0.35	0.10	0.79	0.48	1.31
Uniform Delay, d1	77.0	56.0	56.0	85.0	64.0	46.6	74.5	50.9	47.2	77.1	59.6	69.0
Progression Factor	1.00	1.00	1.00	1.19	0.89	3.15	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	157.1	28.5	60.2	170.3	76.3	0.3	151.9	0.2	0.1	10.1	0.5	157.6
Delay (s)	234.1	84.5	116.2	271.1	133.5	147.2	226.4	51.1	47.2	87.2	60.1	226.6
Level of Service	F	F	F	F	F	F	F	D	D	F	E	F
Approach Delay (s)		127.9			146.8			157.2			145.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	140.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	113.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SEL	SET	SER	NWL	NWR	NET	NER	SWL	SWT
Lane Group Flow (vph)	30	263	262	55	127	725	28	13	375
v/c Ratio	0.07	0.39	0.39	0.42	0.38	0.39	0.03	0.03	0.18
Control Delay	49.4	1.7	1.7	66.2	5.9	7.3	0.1	15.6	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	49.4	1.7	1.7	66.2	5.9	7.6	0.1	15.6	14.2
Queue Length 50th (ft)	11	0	0	45	0	57	0	4	65
Queue Length 95th (ft)	26	0	0	88	27	70	0	17	126
Internal Link Dist (ft)		377				190			349
Turn Bay Length (ft)	200		200					400	
Base Capacity (vph)	475	690	690	394	547	1872	908	377	2090
Starvation Cap Reductn	0	0	0	0	0	526	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.38	0.14	0.23	0.54	0.03	0.03	0.18

Intersection Summary

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	30	0	525	55	0	127	0	725	28	13	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	0.95	1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.85	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1504	1504	1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.28	1.00	
Satd. Flow (perm)	3433	1504	1504	1770		1583		3539	1583	525	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	0	525	55	0	127	0	725	28	13	375	0
RTOR Reduction (vph)	0	230	229	0	0	111	0	0	13	0	0	0
Lane Group Flow (vph)	30	33	33	55	0	16	0	725	15	13	375	0
Turn Type	Split	NA	Prot	Prot		custom		NA	Perm	pm+pt	NA	
Protected Phases	4	4	4	3		3 5		6		5	2	
Permitted Phases									6	2		
Actuated Green, G (s)	16.5	16.5	16.5	9.7		16.7		68.8	68.8	72.6	72.6	
Effective Green, g (s)	16.5	16.5	16.5	9.7		16.7		68.8	68.8	72.6	72.6	
Actuated g/C Ratio	0.13	0.13	0.13	0.07		0.13		0.53	0.53	0.56	0.56	
Clearance Time (s)	7.0	7.0	7.0	7.0				7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	435	190	190	132		203		1872	837	360	1976	
v/s Ratio Prot	0.01	c0.02	0.02	c0.03		0.01		c0.20		0.00	c0.11	
v/s Ratio Perm									0.01	0.02		
v/c Ratio	0.07	0.18	0.18	0.42		0.08		0.39	0.02	0.04	0.19	
Uniform Delay, d1	50.0	50.7	50.7	57.4		49.9		18.1	14.5	13.8	14.2	
Progression Factor	1.00	1.00	1.00	1.00		1.00		0.35	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.4	0.4	2.1		0.2		0.6	0.0	0.0	0.2	
Delay (s)	50.1	51.1	51.1	59.6		50.1		7.0	14.6	13.9	14.4	
Level of Service	D	D	D	E		D		A	B	B	B	
Approach Delay (s)		51.1			52.9			7.3			14.4	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NET	SWT
Lane Group Flow (vph)	270	40	325
v/c Ratio	0.55	0.03	0.17
Control Delay	16.9	9.1	9.3
Queue Delay	0.0	0.0	0.0
Total Delay	16.9	9.1	9.3
Queue Length 50th (ft)	51	2	16
Queue Length 95th (ft)	101	10	34
Internal Link Dist (ft)	1324	350	136
Turn Bay Length (ft)			
Base Capacity (vph)	1763	2901	4168
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.15	0.01	0.08

Intersection Summary

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	250	20	40	0	0	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.91
Frt	0.99		1.00			1.00
Flt Protected	0.96		1.00			1.00
Satd. Flow (prot)	1763		3539			5085
Flt Permitted	0.96		1.00			1.00
Satd. Flow (perm)	1763		3539			5085
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	20	40	0	0	325
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	270	0	40	0	0	325
Turn Type	NA		NA			NA
Protected Phases	4		6			2
Permitted Phases						
Actuated Green, G (s)	11.3		15.0			15.0
Effective Green, g (s)	11.3		15.0			15.0
Actuated g/C Ratio	0.28		0.37			0.37
Clearance Time (s)	7.0		7.0			7.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	494		1317			1892
v/s Ratio Prot	c0.15		0.01			c0.06
v/s Ratio Perm						
v/c Ratio	0.55		0.03			0.17
Uniform Delay, d1	12.3		8.0			8.5
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.2		0.0			0.0
Delay (s)	13.6		8.0			8.5
Level of Service	B		A			A
Approach Delay (s)	13.6		8.0			8.5
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	40.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	645	20	700	625	40
v/c Ratio	0.76	0.19	0.32	0.31	0.03
Control Delay	30.6	42.6	8.4	8.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	42.6	8.4	8.7	0.1
Queue Length 50th (ft)	130	10	85	53	0
Queue Length 95th (ft)	181	32	127	122	0
Internal Link Dist (ft)	455		930	1767	
Turn Bay Length (ft)		300			300
Base Capacity (vph)	987	104	2213	2013	1429
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.19	0.32	0.31	0.03

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	625	20	20	700	625	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		7.0	6.5	6.5	7.0
Lane Util. Factor	0.97		1.00	0.95	0.95	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	3431		1770	3539	3539	1583
Flt Permitted	0.95		0.95	1.00	1.00	1.00
Satd. Flow (perm)	3431		1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	625	20	20	700	625	40
RTOR Reduction (vph)	106	0	0	0	0	11
Lane Group Flow (vph)	539	0	20	700	625	29
Turn Type	NA		Prot	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases						6
Actuated Green, G (s)	18.3		2.0	53.2	44.2	62.5
Effective Green, g (s)	18.3		2.0	53.2	44.2	62.5
Actuated g/C Ratio	0.22		0.02	0.63	0.52	0.74
Clearance Time (s)	7.0		7.0	6.5	6.5	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	738		41	2214	1840	1163
v/s Ratio Prot	c0.16		0.01	c0.20	c0.18	0.01
v/s Ratio Perm						0.01
v/c Ratio	0.73		0.49	0.32	0.34	0.03
Uniform Delay, d1	31.1		41.0	7.4	11.9	3.0
Progression Factor	1.00		1.00	1.00	0.75	0.25
Incremental Delay, d2	3.7		8.9	0.4	0.5	0.0
Delay (s)	34.8		49.9	7.8	9.4	0.8
Level of Service	C		D	A	A	A
Approach Delay (s)	34.8			9.0	8.9	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	80	125	150	750	2000	150	1425	750
v/c Ratio	0.63	0.08	0.55	0.73	0.81	0.75	0.62	0.47
Control Delay	102.5	0.1	73.4	29.8	19.2	98.8	19.8	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.5	0.1	73.4	29.8	19.2	98.8	19.8	1.0
Queue Length 50th (ft)	93	0	150	205	450	174	505	0
Queue Length 95th (ft)	157	0	m201	m273	216	256	573	0
Internal Link Dist (ft)	610				1235		338	
Turn Bay Length (ft)		270		365		390		
Base Capacity (vph)	140	1530	275	1017	2464	236	2311	1584
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.08	0.55	0.74	0.81	0.64	0.62	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	80	125	150	0	750	0	1900	100	150	1425	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			3%			1%			-4%	
Total Lost time (s)		7.0	4.0	7.0		7.0		7.0		7.0	7.0	4.0
Lane Util. Factor		1.00	1.00	1.00		0.88		0.91		1.00	0.95	1.00
Frt		1.00	0.85	1.00		0.85		0.99		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)		1800	1530	1710		2692		4925		1770	3541	1584
Flt Permitted		1.00	1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)		1800	1530	1710		2692		4925		1770	3541	1584
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	80	125	150	0	750	0	1900	100	150	1425	750
RTOR Reduction (vph)	0	0	0	0	0	191	0	3	0	0	0	0
Lane Group Flow (vph)	0	80	125	150	0	559	0	1997	0	150	1425	750
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Free	Prot		custom		NA		Prot	NA	Free
Protected Phases		3		4		4 1		2		1	6	
Permitted Phases			Free									Free
Actuated Green, G (s)		12.7	180.0	28.7		56.2		90.1		20.5	117.6	180.0
Effective Green, g (s)		12.7	180.0	28.7		56.2		90.1		20.5	117.6	180.0
Actuated g/C Ratio		0.07	1.00	0.16		0.31		0.50		0.11	0.65	1.00
Clearance Time (s)		7.0		7.0				7.0		7.0	7.0	
Vehicle Extension (s)		4.0		4.0				5.0		4.0	5.0	
Lane Grp Cap (vph)		127	1530	272		840		2465		201	2313	1584
v/s Ratio Prot		0.04		0.09		c0.21		c0.41		0.08	c0.40	
v/s Ratio Perm			0.08									c0.47
v/c Ratio		0.63	0.08	0.55		0.67		0.81		0.75	0.62	0.47
Uniform Delay, d1		81.4	0.0	69.7		53.7		37.8		77.2	18.1	0.0
Progression Factor		1.00	1.00	0.96		0.79		0.45		1.00	1.00	1.00
Incremental Delay, d2		10.6	0.1	2.4		1.8		1.6		14.8	1.2	1.0
Delay (s)		92.0	0.1	69.0		44.1		18.6		92.1	19.3	1.0
Level of Service		F	A	E		D		B		F	B	A
Approach Delay (s)		36.0			48.2			18.6			18.1	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	325	10	100	40	125	20	1575	10	60	1425	90
v/c Ratio	0.87	0.02	0.23	0.48	0.69	0.14	0.85	0.01	0.56	0.73	0.10
Control Delay	89.0	52.1	7.2	101.8	37.2	15.0	30.6	0.0	50.0	20.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	89.0	52.1	7.2	101.8	37.2	15.0	30.7	0.0	50.0	20.5	0.5
Queue Length 50th (ft)	367	9	0	47	15	6	853	0	21	317	0
Queue Length 95th (ft)	#522	28	42	93	91	m11	740	m0	m#69	342	7
Internal Link Dist (ft)		602		1004			953			1235	
Turn Bay Length (ft)	80		80			360		390	380		
Base Capacity (vph)	396	442	453	95	190	142	1855	878	107	1961	867
Starvation Cap Reductn	0	0	0	0	0	0	21	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.02	0.22	0.42	0.66	0.14	0.86	0.01	0.56	0.73	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	325	10	100	30	10	125	20	1575	10	60	1425	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1719	1516	1752	3505	1562	1752	3498	1462
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.09	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1719	1516	170	3505	1562	92	3498	1462
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	325	10	100	30	10	125	20	1575	10	60	1425	90
RTOR Reduction (vph)	0	0	77	0	0	107	0	0	5	0	0	41
Lane Group Flow (vph)	325	10	23	0	40	18	20	1575	5	60	1425	49
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	41.6	41.6	41.6		8.8	8.8	98.3	95.2	95.2	103.9	98.0	98.0
Effective Green, g (s)	41.6	41.6	41.6		8.8	8.8	98.3	95.2	95.2	103.9	98.0	98.0
Actuated g/C Ratio	0.23	0.23	0.23		0.05	0.05	0.55	0.53	0.53	0.58	0.54	0.54
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	375	418	348		84	74	120	1853	826	107	1904	795
v/s Ratio Prot	c0.20	0.01			c0.02		0.00	c0.45		c0.02	c0.41	
v/s Ratio Perm			0.02			0.01	0.09		0.00	0.30		0.03
v/c Ratio	0.87	0.02	0.07		0.48	0.25	0.17	0.85	0.01	0.56	0.75	0.06
Uniform Delay, d1	66.5	53.5	54.0		83.4	82.4	25.6	36.3	20.0	32.6	31.5	19.3
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.84	0.71	1.00	1.72	0.59	0.19
Incremental Delay, d2	21.4	0.1	0.3		4.2	1.8	0.5	4.1	0.0	5.5	2.3	0.1
Delay (s)	88.0	53.6	54.3		87.6	84.2	22.0	29.8	20.1	61.6	20.9	3.8
Level of Service	F	D	D		F	F	C	C	C	E	C	A
Approach Delay (s)		79.4			85.0			29.7			21.4	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

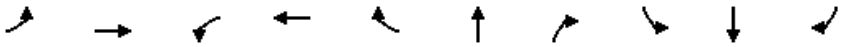
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	70	125	1500	70	40	1475
v/c Ratio	0.56	0.57	0.57	0.06	0.16	0.51
Control Delay	93.8	24.4	10.2	1.4	1.3	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	93.8	24.4	10.2	1.4	1.3	0.7
Queue Length 50th (ft)	81	10	364	0	1	8
Queue Length 95th (ft)	137	81	490	16	m2	20
Internal Link Dist (ft)	56		3201			953
Turn Bay Length (ft)				350	405	
Base Capacity (vph)	208	284	2633	1193	261	2909
Starvation Cap Reductn	0	0	0	0	0	218
Spillback Cap Reductn	0	3	93	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.44	0.59	0.06	0.15	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	70	125	1500	70	40	1475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		4%			-1%
Total Lost time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1388	1242	3402	1522	1744	3489
Flt Permitted	0.95	1.00	1.00	1.00	0.13	1.00
Satd. Flow (perm)	1388	1242	3402	1522	245	3489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	125	1500	70	40	1475
RTOR Reduction (vph)	0	105	0	16	0	0
Lane Group Flow (vph)	70	20	1500	54	40	1475
Heavy Vehicles (%)	30%	30%	4%	4%	4%	4%
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2	6	
Actuated Green, G (s)	16.4	16.4	137.9	137.9	150.1	150.1
Effective Green, g (s)	16.4	16.4	137.9	137.9	150.1	150.1
Actuated g/C Ratio	0.09	0.09	0.77	0.77	0.83	0.83
Clearance Time (s)	7.0	7.0	6.5	6.5	7.0	6.5
Vehicle Extension (s)	5.0	5.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	126	113	2606	1166	247	2909
v/s Ratio Prot	c0.05		c0.44		0.00	c0.42
v/s Ratio Perm		0.02		0.04	0.13	
v/c Ratio	0.56	0.17	0.58	0.05	0.16	0.51
Uniform Delay, d1	78.3	75.5	8.8	5.1	6.1	4.3
Progression Factor	1.00	1.00	1.00	1.00	0.11	0.05
Incremental Delay, d2	8.7	1.5	0.9	0.1	0.2	0.5
Delay (s)	87.0	77.1	9.7	5.2	0.9	0.7
Level of Service	F	E	A	A	A	A
Approach Delay (s)	80.6		9.5			0.7
Approach LOS	F		A			A

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	600	865	30	450	125	70	30	250	80	525
v/c Ratio	1.31	0.93	0.27	0.64	0.18	0.51	0.11	0.56	0.17	1.33
Control Delay	181.9	43.8	26.8	47.5	1.4	79.3	0.8	43.6	33.0	200.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.9	43.8	26.8	47.5	1.4	79.3	0.8	43.6	33.0	200.4
Queue Length 50th (ft)	~593	~901	13	380	0	67	0	233	58	~673
Queue Length 95th (ft)	#836	#1223	33	531	8	118	0	311	87	#907
Internal Link Dist (ft)		3024		1297		1097			1436	
Turn Bay Length (ft)	220		315					380		
Base Capacity (vph)	459	933	111	699	682	336	434	443	466	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.31	0.93	0.27	0.64	0.18	0.21	0.07	0.56	0.17	1.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	600	825	40	30	450	125	20	50	30	250	80	525
Ideal Flow (vphpl)	2000	1900	1900	1900	2000	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-2%			4%			-3%	
Total Lost time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1835	1822		1787	1980	1599		1800	1552	1796	1891	1607
Flt Permitted	0.22	1.00		0.08	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	419	1822		146	1980	1599		1800	1552	1796	1891	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	600	825	40	30	450	125	20	50	30	250	80	525
RTOR Reduction (vph)	0	1	0	0	0	82	0	0	28	0	0	0
Lane Group Flow (vph)	600	864	0	30	450	43	0	70	2	250	80	525
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2			3			4
Actuated Green, G (s)	82.6	72.6		54.6	51.6	51.6		9.9	9.9	37.0	37.0	37.0
Effective Green, g (s)	82.6	72.6		54.6	51.6	51.6		9.9	9.9	37.0	37.0	37.0
Actuated g/C Ratio	0.55	0.48		0.36	0.34	0.34		0.07	0.07	0.25	0.25	0.25
Clearance Time (s)	7.0	6.5		7.0	6.5	6.5		7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	2.5	4.0		2.5	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	457	881		85	681	550		118	102	443	466	396
v/s Ratio Prot	c0.21	0.47		0.01	0.23			c0.04		0.14	0.04	
v/s Ratio Perm	c0.51			0.12		0.03			0.00			c0.33
v/c Ratio	1.31	0.98		0.35	0.66	0.08		0.59	0.02	0.56	0.17	1.33
Uniform Delay, d1	30.0	38.0		37.5	41.8	33.2		68.1	65.5	49.4	44.4	56.5
Progression Factor	1.33	0.72		1.00	1.00	1.00		1.00	1.00	0.77	0.72	0.82
Incremental Delay, d2	155.6	25.9		1.8	5.0	0.3		7.8	0.1	1.6	0.2	163.0
Delay (s)	195.5	53.4		39.4	46.8	33.4		75.9	65.6	39.6	32.1	209.3
Level of Service	F	D		D	D	C		E	E	D	C	F
Approach Delay (s)		111.6			43.6			72.8			143.1	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	105.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	800	475	450	850	625	450
v/c Ratio	0.69	0.57	0.83	0.45	0.90	0.27
Control Delay	54.0	19.2	65.7	24.3	59.7	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	19.2	65.7	24.3	59.7	13.4
Queue Length 50th (ft)	201	22	228	305	558	98
Queue Length 95th (ft)	433	334	m222	m306	703	122
Internal Link Dist (ft)	1397			2206	648	
Turn Bay Length (ft)		400	500		300	
Base Capacity (vph)	1167	840	577	1869	767	1660
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.57	0.78	0.45	0.81	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	800	475	450	850	625	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	800	475	450	850	625	450
RTOR Reduction (vph)	0	318	0	0	0	16
Lane Group Flow (vph)	800	157	450	850	625	434
Turn Type	NA	Perm	Prot	NA	NA	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	49.5	49.5	23.7	79.2	58.8	88.5
Effective Green, g (s)	49.5	49.5	23.7	79.2	58.8	88.5
Actuated g/C Ratio	0.33	0.33	0.16	0.53	0.39	0.59
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1167	522	542	1868	693	1644
v/s Ratio Prot	c0.23		c0.13	0.24	c0.35	0.16
v/s Ratio Perm		0.10				
v/c Ratio	0.69	0.30	0.83	0.46	0.90	0.26
Uniform Delay, d1	43.5	37.4	61.2	22.0	42.9	14.9
Progression Factor	1.13	4.80	0.93	1.03	1.00	1.00
Incremental Delay, d2	2.8	1.2	6.8	0.5	15.0	0.1
Delay (s)	51.7	180.7	63.6	23.2	57.9	15.0
Level of Service	D	F	E	C	E	B
Approach Delay (s)	99.8			37.2	39.9	
Approach LOS	F			D	D	

Intersection Summary			
HCM 2000 Control Delay	59.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	10	1250	30	10	1500	325	100
v/c Ratio	0.06	0.58	0.03	0.04	0.68	0.70	0.21
Control Delay	11.3	18.0	0.1	18.5	31.0	58.2	7.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	18.3	0.1	18.5	31.0	58.2	7.6
Queue Length 50th (ft)	3	233	0	5	580	287	0
Queue Length 95th (ft)	m10	605	1	m9	m739	374	44
Internal Link Dist (ft)		603			592	815	
Turn Bay Length (ft)	180		290	400			680
Base Capacity (vph)	165	2158	996	233	2201	554	564
Starvation Cap Reductn	0	340	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.69	0.03	0.04	0.68	0.59	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1250	30	10	1500	0	325	0	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00			
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00			
Satd. Flow (prot)	1752	3504	1567	1787	3575			1770	1583			
Flt Permitted	0.09	1.00	1.00	0.15	1.00			0.95	1.00			
Satd. Flow (perm)	168	3504	1567	281	3575			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	1250	30	10	1500	0	325	0	100	0	0	0
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	10	1250	18	10	1500	0	0	325	26	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4		4	8		
Actuated Green, G (s)	90.4	88.2	88.2	90.4	88.2			39.1	39.1			
Effective Green, g (s)	90.4	88.2	88.2	90.4	88.2			39.1	39.1			
Actuated g/C Ratio	0.60	0.59	0.59	0.60	0.59			0.26	0.26			
Clearance Time (s)	7.0	6.5	6.5	7.0	6.5			7.0	7.0			
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0			3.0	3.0			
Lane Grp Cap (vph)	124	2060	921	191	2102			461	412			
v/s Ratio Prot	c0.00	0.36		0.00	c0.42							
v/s Ratio Perm	0.05		0.01	0.03				0.18	0.02			
v/c Ratio	0.08	0.61	0.02	0.05	0.71			0.70	0.06			
Uniform Delay, d1	17.9	19.8	12.9	14.8	21.9			50.2	41.7			
Progression Factor	0.90	0.86	1.00	1.55	1.37			1.00	1.00			
Incremental Delay, d2	0.3	1.3	0.0	0.1	1.6			4.9	0.1			
Delay (s)	16.4	18.4	12.9	23.0	31.6			55.1	41.7			
Level of Service	B	B	B	C	C			E	D			
Approach Delay (s)		18.3			31.5			51.9			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	400	10	30	875	475	70	425	225	275	150	375
v/c Ratio	0.69	0.22	0.01	0.18	0.57	0.47	0.24	0.74	0.42	0.97	0.18	0.52
Control Delay	72.7	20.8	0.0	77.7	26.0	6.5	38.4	67.9	7.1	104.5	43.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	72.7	20.8	0.0	77.7	26.0	6.8	38.4	67.9	7.1	104.5	43.7	12.9
Queue Length 50th (ft)	135	115	0	15	235	94	49	211	0	217	38	44
Queue Length 95th (ft)	180	166	0	m23	346	66	83	259	62	#335	75	71
Internal Link Dist (ft)		1562			603			1172			469	
Turn Bay Length (ft)	440		360	365		410	410		360	300		290
Base Capacity (vph)	409	1841	997	171	1539	1001	289	1074	646	284	1275	725
Starvation Cap Reductn	0	0	0	0	0	150	0	0	0	0	0	44
Spillback Cap Reductn	0	137	0	0	0	0	0	0	8	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.23	0.01	0.18	0.57	0.56	0.24	0.40	0.35	0.97	0.12	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	400	10	30	875	475	70	425	225	275	150	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-5%			-3%			-4%	
Total Lost time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3364	3468	1552	3519	3628	1623	1832	3664	1639	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.66	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	3364	3468	1552	3519	3628	1623	1267	3664	1639	442	3610	1615
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	275	400	10	30	875	475	70	425	225	275	150	375
RTOR Reduction (vph)	0	0	5	0	0	67	0	0	181	0	0	78
Lane Group Flow (vph)	275	400	5	30	875	408	70	425	44	275	150	297
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	17.7	75.5	81.1	4.5	62.3	78.3	30.6	25.0	29.5	48.0	35.4	53.1
Effective Green, g (s)	17.7	75.5	81.1	4.5	62.3	78.3	30.6	25.0	29.5	48.0	35.4	53.1
Actuated g/C Ratio	0.12	0.50	0.54	0.03	0.42	0.52	0.20	0.17	0.20	0.32	0.24	0.35
Clearance Time (s)	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0	7.0	7.5	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	396	1745	839	105	1506	847	279	610	322	286	851	571
v/s Ratio Prot	c0.08	0.12	0.00	0.01	c0.24	0.05	0.01	0.12	0.00	c0.10	0.04	0.06
v/s Ratio Perm			0.00			0.20	0.04		0.02	c0.20		0.12
v/c Ratio	0.69	0.23	0.01	0.29	0.58	0.48	0.25	0.70	0.14	0.96	0.18	0.52
Uniform Delay, d1	63.6	20.9	15.9	71.2	33.8	22.9	49.4	58.9	49.7	44.5	45.7	38.4
Progression Factor	1.00	1.00	1.00	1.11	0.73	0.39	1.00	1.00	1.00	1.43	0.94	0.47
Incremental Delay, d2	5.2	0.3	0.0	1.1	1.2	0.3	0.5	3.5	0.2	41.2	0.1	0.8
Delay (s)	68.8	21.2	15.9	80.2	25.7	9.3	49.9	62.4	49.9	105.0	43.2	18.8
Level of Service	E	C	B	F	C	A	D	E	D	F	D	B
Approach Delay (s)		40.2			21.3			57.3			53.0	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	10	425	1200	180
v/c Ratio	0.04	0.22	0.67	0.45
Control Delay	5.8	6.4	12.4	20.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.8	6.4	12.4	20.5
Queue Length 50th (ft)	1	31	112	29
Queue Length 95th (ft)	7	60	316	122
Internal Link Dist (ft)		2661	1814	972
Turn Bay Length (ft)	275			
Base Capacity (vph)	322	3480	3389	1517
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.03	0.12	0.35	0.12

Intersection Summary

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	10	425	0	900	300	150	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%		-1%		-6%	
Total Lost time (s)	7.0	6.5		6.5		7.0	
Lane Util. Factor	1.00	0.95		0.95		1.00	
Frt	1.00	1.00		0.96		0.98	
Flt Protected	0.95	1.00		1.00		0.96	
Satd. Flow (prot)	1744	3480		3390		1836	
Flt Permitted	0.12	1.00		1.00		0.96	
Satd. Flow (perm)	220	3480		3390		1836	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	425	0	900	300	150	30
RTOR Reduction (vph)	0	0	0	24	0	52	0
Lane Group Flow (vph)	10	425	0	1176	0	128	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	0%	0%
Bus Blockages (#/hr)	0	1	0	0	0	0	0
Turn Type	pm+pt	NA	Prot	NA		NA	
Protected Phases	5	2	1	6		3	
Permitted Phases	2						
Actuated Green, G (s)	37.5	37.5		29.7		11.0	
Effective Green, g (s)	37.5	37.5		29.7		11.0	
Actuated g/C Ratio	0.60	0.60		0.48		0.18	
Clearance Time (s)	7.0	6.5		6.5		7.0	
Vehicle Extension (s)	2.5	3.0		3.0		3.0	
Lane Grp Cap (vph)	152	2104		1623		325	
v/s Ratio Prot	0.00	c0.12		c0.35		c0.07	
v/s Ratio Perm	0.04						
v/c Ratio	0.07	0.20		0.72		0.39	
Uniform Delay, d1	7.5	5.5		12.9		22.6	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.1	0.0		1.6		0.8	
Delay (s)	7.7	5.6		14.5		23.3	
Level of Service	A	A		B		C	
Approach Delay (s)		5.6		14.5		23.3	
Approach LOS		A		B		C	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	450	30	30	1075	100	100	475
v/c Ratio	0.30	0.05	0.06	0.48	0.26	0.26	0.86
Control Delay	28.0	0.2	22.6	4.6	31.8	31.8	43.9
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	28.0	0.2	22.6	5.0	31.8	31.8	43.9
Queue Length 50th (ft)	80	0	8	103	53	53	219
Queue Length 95th (ft)	110	0	m15	45	97	97	#339
Internal Link Dist (ft)	2158			451		781	
Turn Bay Length (ft)		260	190		525		500
Base Capacity (vph)	1485	546	476	2258	447	447	618
Starvation Cap Reductn	0	0	0	609	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.05	0.06	0.65	0.22	0.22	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↰	↱
Volume (vph)	0	450	30	30	1075	0	0	0	0	200	0	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050
Grade (%)		2%			-2%			0%			3%	
Total Lost time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	1.00
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5034	1567	1787	3575					1656	1656	1980
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5034	1567	1787	3575					1656	1656	1980
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	450	30	30	1075	0	0	0	0	200	0	475
RTOR Reduction (vph)	0	0	21	0	0	0	0	0	0	0	0	88
Lane Group Flow (vph)	0	450	9	30	1075	0	0	0	0	100	100	387
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			2									
Actuated Green, G (s)		29.5	29.5	26.7	63.2					23.3	23.3	23.3
Effective Green, g (s)		29.5	29.5	26.7	63.2					23.3	23.3	23.3
Actuated g/C Ratio		0.29	0.29	0.27	0.63					0.23	0.23	0.23
Clearance Time (s)		6.5	6.5	7.0	6.5					7.0	7.0	7.0
Vehicle Extension (s)		5.0	5.0	3.5	5.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1485	462	477	2259					385	385	461
v/s Ratio Prot		0.09		0.02	c0.30					0.06	0.06	c0.20
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.02	0.06	0.48					0.26	0.26	0.84
Uniform Delay, d1		27.3	25.0	27.3	9.7					31.3	31.3	36.6
Progression Factor		1.00	1.00	0.75	0.39					1.00	1.00	1.00
Incremental Delay, d2		0.5	0.1	0.2	0.5					0.4	0.4	12.6
Delay (s)		27.8	25.1	20.7	4.3					31.7	31.7	49.2
Level of Service		C	C	C	A					C	C	D
Approach Delay (s)		27.6			4.8			0.0			44.0	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	125	500	850	175	455	125
v/c Ratio	0.36	0.25	0.61	0.24	0.85	0.26
Control Delay	35.9	24.8	28.0	4.7	47.6	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	24.8	28.0	4.7	47.6	26.4
Queue Length 50th (ft)	44	170	228	0	267	59
Queue Length 95th (ft)	74	227	317	45	365	99
Internal Link Dist (ft)		451	1741		948	
Turn Bay Length (ft)	184			280		215
Base Capacity (vph)	345	1964	1389	728	633	564
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.25	0.61	0.24	0.72	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	500	0	0	850	175	425	30	125	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			0%	
Total Lost time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3399	3504			3575	1599		1762	1567			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3399	3504			3575	1599		1762	1567			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	500	0	0	850	175	425	30	125	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	107	0	0	0	0	0	0
Lane Group Flow (vph)	125	500	0	0	850	68	0	455	125	0	0	0
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	5	2			6		4	4	4			
Permitted Phases						6						
Actuated Green, G (s)	10.2	56.1			38.9	38.9		30.4	30.4			
Effective Green, g (s)	10.2	56.1			38.9	38.9		30.4	30.4			
Actuated g/C Ratio	0.10	0.56			0.39	0.39		0.30	0.30			
Clearance Time (s)	7.0	6.5			6.5	6.5		7.0	7.0			
Vehicle Extension (s)	4.0	5.0			5.0	5.0		3.0	3.0			
Lane Grp Cap (vph)	346	1965			1390	622		535	476			
v/s Ratio Prot	0.04	c0.14			c0.24			c0.26	0.08			
v/s Ratio Perm						0.04						
v/c Ratio	0.36	0.25			0.61	0.11		0.85	0.26			
Uniform Delay, d1	41.9	11.2			24.5	19.5		32.7	26.3			
Progression Factor	0.78	2.01			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.9	0.3			2.0	0.4		12.3	0.3			
Delay (s)	33.7	22.9			26.5	19.9		45.0	26.6			
Level of Service	C	C			C	B		D	C			
Approach Delay (s)		25.0			25.4			41.0			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

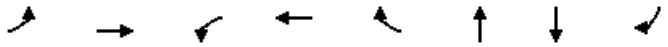
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	40	382	737	741	425	125	250	700
v/c Ratio	0.29	0.34	0.57	0.90	0.76	0.62	0.30	0.46	0.48
Control Delay	83.5	57.3	35.9	33.2	22.7	57.7	10.0	59.9	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	57.3	35.9	33.2	22.7	57.7	10.0	59.9	33.4
Queue Length 50th (ft)	26	19	270	362	431	180	0	104	238
Queue Length 95th (ft)	79	75	453	712	701	325	57	199	416
Internal Link Dist (ft)		1005		682		1789			2364
Turn Bay Length (ft)	170		310				390	470	
Base Capacity (vph)	104	118	1191	1152	1304	1082	574	1362	2216
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.34	0.32	0.64	0.57	0.39	0.22	0.18	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	20	20	425	10	1425	0	425	125	250	700	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95		0.95	1.00	0.97	0.95	
Frt	1.00	0.93		1.00	0.86	0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1740		1732	1499	1550		3504	1567	3399	3504	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1740		1732	1499	1550		3504	1567	3399	3504	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	20	20	425	10	1425	0	425	125	250	700	0
RTOR Reduction (vph)	0	17	0	0	236	41	0	0	100	0	0	0
Lane Group Flow (vph)	30	23	0	382	501	700	0	425	25	250	700	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	5.2	5.2		52.2	52.2	73.6		27.3	27.3	21.4	55.7	
Effective Green, g (s)	5.2	5.2		52.2	52.2	73.6		27.3	27.3	21.4	55.7	
Actuated g/C Ratio	0.04	0.04		0.39	0.39	0.55		0.20	0.20	0.16	0.42	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0		5.0	5.0	4.0	5.0	
Lane Grp Cap (vph)	69	67		674	583	931		713	319	542	1455	
v/s Ratio Prot	c0.02	0.01		0.22	c0.33	c0.12		c0.12		0.07	0.20	
v/s Ratio Perm						0.33			0.02			
v/c Ratio	0.43	0.34		0.57	0.86	0.75		0.60	0.08	0.46	0.48	
Uniform Delay, d1	63.0	62.8		32.1	37.6	23.2		48.4	43.2	51.1	28.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.3	3.0		1.1	12.0	3.7		2.0	0.2	0.9	0.5	
Delay (s)	67.4	65.8		33.2	49.6	26.9		50.4	43.5	52.0	29.2	
Level of Service	E	E		C	D	C		D	D	D	C	
Approach Delay (s)		66.5			37.2			48.8			35.2	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	134.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	200	860	10	1800	90	20	375	500
v/c Ratio	1.68	0.29	0.12	0.70	0.10	0.10	0.91	0.80
Control Delay	373.2	15.3	72.0	31.8	1.2	0.9	83.1	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	373.2	15.3	72.0	31.8	1.2	0.9	83.1	27.7
Queue Length 50th (ft)	~290	132	10	538	0	0	354	153
Queue Length 95th (ft)	#447	220	31	600	10	0	#527	306
Internal Link Dist (ft)		452		967		434	631	
Turn Bay Length (ft)	250		255		360			175
Base Capacity (vph)	119	2979	82	2569	864	516	436	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	32
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.68	0.29	0.12	0.70	0.10	0.04	0.86	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	850	10	10	1800	90	10	0	10	375	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			0%			0%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (prot)	1787	5127		1770	5085	1583		1695			1770	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.95	1.00
Satd. Flow (perm)	1787	5127		1770	5085	1583		1695			1770	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	850	10	10	1800	90	10	0	10	375	0	500
RTOR Reduction (vph)	0	0	0	0	0	46	0	19	0	0	0	261
Lane Group Flow (vph)	200	860	0	10	1800	44	0	1	0	0	375	239
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases						2						3
Actuated Green, G (s)	10.0	80.2		2.8	73.0	73.0		4.2			34.8	34.8
Effective Green, g (s)	10.0	80.2		2.8	73.0	73.0		4.2			34.8	34.8
Actuated g/C Ratio	0.07	0.53		0.02	0.49	0.49		0.03			0.23	0.23
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0			3.0	3.0
Lane Grp Cap (vph)	119	2741		33	2474	770		47			410	367
v/s Ratio Prot	c0.11	0.17		0.01	c0.35			c0.00			c0.21	
v/s Ratio Perm						0.03						0.15
v/c Ratio	1.68	0.31		0.30	0.73	0.06		0.01			0.91	0.65
Uniform Delay, d1	70.0	19.5		72.6	30.6	20.3		70.9			56.2	52.1
Progression Factor	0.88	0.84		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	336.9	0.3		5.1	1.9	0.1		0.1			24.6	4.1
Delay (s)	398.7	16.7		77.8	32.5	20.5		71.0			80.7	56.2
Level of Service	F	B		E	C	C		E			F	E
Approach Delay (s)		88.7			32.2			71.0			66.7	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	55.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	875	10	250	1825	30	40	60	156	154	70
v/c Ratio	0.61	0.73	0.02	0.37	0.72	0.04	0.35	0.41	0.63	0.62	0.20
Control Delay	81.2	65.3	0.1	33.5	27.3	1.8	89.2	43.5	82.2	81.5	1.3
Queue Delay	0.0	0.0	0.0	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	65.3	0.1	36.4	27.5	1.8	89.2	43.5	82.2	81.5	1.3
Queue Length 50th (ft)	142	343	0	199	574	1	45	23	180	177	0
Queue Length 95th (ft)	210	404	0	348	738	14	94	80	273	270	0
Internal Link Dist (ft)		967			196			671		824	
Turn Bay Length (ft)	500		200						430		430
Base Capacity (vph)	412	1929	658	680	2612	857	369	380	445	447	516
Starvation Cap Reductn	0	0	0	320	227	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.45	0.02	0.69	0.77	0.04	0.11	0.16	0.35	0.34	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	875	10	250	1825	30	40	20	40	300	10	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			2%			0%			-3%	
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3467	5136	1599	1752	5034	1567	1770	1676		1706	1716	1607
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3467	5136	1599	1752	5034	1567	1770	1676		1706	1716	1607
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	875	10	250	1825	30	40	20	40	300	10	70
RTOR Reduction (vph)	0	0	8	0	0	15	0	36	0	0	0	60
Lane Group Flow (vph)	250	875	2	250	1825	15	40	24	0	156	154	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		8	8		3	3	
Permitted Phases			6			2						3
Actuated Green, G (s)	20.6	40.5	40.5	67.4	87.3	87.3	11.3	11.3		25.0	25.0	25.0
Effective Green, g (s)	20.6	40.5	40.5	67.4	87.3	87.3	11.3	11.3		25.0	25.0	25.0
Actuated g/C Ratio	0.12	0.23	0.23	0.39	0.50	0.50	0.07	0.07		0.14	0.14	0.14
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.5	3.0	3.0	3.0	3.0	3.0	4.0	4.0		3.0	3.0	3.0
Lane Grp Cap (vph)	412	1200	373	681	2537	789	115	109		246	247	231
v/s Ratio Prot	0.07	c0.17		0.14	c0.36		c0.02	0.01		c0.09	0.09	
v/s Ratio Perm			0.00			0.01						0.01
v/c Ratio	0.61	0.73	0.01	0.37	0.72	0.02	0.35	0.22		0.63	0.62	0.04
Uniform Delay, d1	72.5	61.3	50.9	37.7	33.4	21.5	77.4	76.8		69.8	69.7	63.8
Progression Factor	1.00	1.00	1.00	0.78	0.74	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	2.3	0.0	0.3	1.0	0.0	2.5	1.4		5.3	4.8	0.1
Delay (s)	75.1	63.5	50.9	29.6	25.7	21.5	79.9	78.1		75.1	74.5	63.9
Level of Service	E	E	D	C	C	C	E	E		E	E	E
Approach Delay (s)		66.0			26.1			78.8			72.8	
Approach LOS		E			C			E			E	

Intersection Summary				
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	173.2	Sum of lost time (s)	29.0	
Intersection Capacity Utilization	76.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	450	10	20	600	30	2200	1250
v/c Ratio	0.84	0.03	0.45	0.17	0.43	0.59	0.88
Control Delay	95.7	2.2	153.8	2.3	111.9	14.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.7	2.2	153.8	2.3	111.9	14.5	13.7
Queue Length 50th (ft)	301	0	27	21	39	518	331
Queue Length 95th (ft)	357	4	m#64	10	81	612	813
Internal Link Dist (ft)	1564			126		1018	
Turn Bay Length (ft)					315		
Base Capacity (vph)	643	355	44	3589	79	3722	1413
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.03	0.45	0.17	0.38	0.59	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	450	10	20	600	30	2200	1250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.91	1.00	0.91	1.00
Frt	1.00	0.85	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	1770	5085	1583
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	10	20	600	30	2200	1250
RTOR Reduction (vph)	0	8	0	0	0	0	268
Lane Group Flow (vph)	450	2	20	600	30	2200	982
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	31.4	34.4	3.0	139.7	6.9	143.6	143.6
Effective Green, g (s)	31.4	34.4	3.0	139.7	6.9	143.6	143.6
Actuated g/C Ratio	0.16	0.17	0.02	0.70	0.03	0.72	0.72
Clearance Time (s)	7.5	7.0	7.0	7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	538	272	26	3551	61	3651	1136
v/s Ratio Prot	c0.13	0.00	0.01	0.12	c0.02	0.43	
v/s Ratio Perm		0.00					c0.62
v/c Ratio	0.84	0.01	0.77	0.17	0.49	0.60	0.86
Uniform Delay, d1	81.8	68.6	98.2	10.3	94.8	14.0	20.9
Progression Factor	1.00	1.00	1.28	0.21	1.00	1.00	1.00
Incremental Delay, d2	10.9	0.0	79.8	0.1	6.1	0.7	8.8
Delay (s)	92.7	68.6	205.6	2.2	100.9	14.8	29.8
Level of Service	F	E	F	A	F	B	C
Approach Delay (s)	92.1			8.8		20.9	
Approach LOS	F			A		C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	951	3505	408	142	134	132
v/c Ratio	0.53	0.23	0.78	0.29	0.74	0.52	0.34
Control Delay	87.6	4.3	16.0	0.6	98.1	27.1	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.6	4.3	16.0	0.6	98.1	27.1	31.6
Queue Length 50th (ft)	81	82	550	0	173	37	72
Queue Length 95th (ft)	120	119	668	2	251	115	135
Internal Link Dist (ft)		1701	1154			995	
Turn Bay Length (ft)	575				435		
Base Capacity (vph)	256	4132	4497	1410	420	444	430
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.23	0.78	0.29	0.34	0.30	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	125	875	0	0	0	3225	375	0	0	0	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Lane Util. Factor	0.97	0.91				0.86	1.00				0.95	0.91
Frt	1.00	1.00				1.00	0.85				1.00	0.87
Flt Protected	0.95	1.00				1.00	1.00				0.95	0.99
Satd. Flow (prot)	3433	5085				6408	1583				1681	1469
Flt Permitted	0.95	1.00				1.00	1.00				0.95	0.99
Satd. Flow (perm)	3433	5085				6408	1583				1681	1469
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	951	0	0	0	3505	408	0	0	0	163	0
RTOR Reduction (vph)	0	0	0	0	0	0	75	0	0	0	0	91
Lane Group Flow (vph)	136	951	0	0	0	3505	333	0	0	0	142	43
Turn Type	Prot	NA		custom		NA	pm+ov	Split			Split	NA
Protected Phases	1	6				2	4	3	3		4	4
Permitted Phases				5			2					
Actuated Green, G (s)	13.5	146.3				126.3	147.0				20.7	20.7
Effective Green, g (s)	13.5	146.3				126.3	147.0				20.7	20.7
Actuated g/C Ratio	0.08	0.81				0.70	0.82				0.11	0.11
Clearance Time (s)	6.5	6.5				6.5	6.5				6.5	6.5
Vehicle Extension (s)	3.0	4.0				4.0	3.0				3.0	3.0
Lane Grp Cap (vph)	257	4132				4496	1349				193	168
v/s Ratio Prot	c0.04	0.19				c0.55	0.03				c0.08	0.03
v/s Ratio Perm							0.18					
v/c Ratio	0.53	0.23				0.78	0.25				0.74	0.26
Uniform Delay, d1	80.2	3.9				17.7	3.8				77.0	72.6
Progression Factor	1.00	1.00				0.78	0.18				1.00	1.00
Incremental Delay, d2	2.0	0.1				1.4	0.1				13.6	0.8
Delay (s)	82.2	4.0				15.1	0.8				90.6	73.4
Level of Service	F	A				B	A				F	E
Approach Delay (s)		13.8				13.7			0.0			75.8
Approach LOS		B				B			A			E

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	225
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	0.95
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1504
Flt Permitted	1.00
Satd. Flow (perm)	1504
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	245
RTOR Reduction (vph)	49
Lane Group Flow (vph)	83
Turn Type	pm+ov
Protected Phases	1
Permitted Phases	4
Actuated Green, G (s)	34.2
Effective Green, g (s)	34.2
Actuated g/C Ratio	0.19
Clearance Time (s)	6.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	340
v/s Ratio Prot	0.02
v/s Ratio Perm	0.04
v/c Ratio	0.24
Uniform Delay, d1	61.9
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	62.3
Level of Service	E
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	848	98	3043	43	22	22	22	163	136	1033
v/c Ratio	0.98	0.26	0.68	0.70	0.04	0.25	0.24	0.10	0.66	1.01	0.37
Control Delay	138.1	12.2	108.6	9.6	0.4	88.7	87.8	0.9	94.7	160.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.1	12.2	108.6	9.6	0.4	88.7	87.8	0.9	94.7	160.1	0.4
Queue Length 50th (ft)	113	169	120	276	0	26	26	0	98	~166	0
Queue Length 95th (ft)	#187	152	m153	358	m1	59	59	0	142	#325	0
Internal Link Dist (ft)		1154		740			701			434	
Turn Bay Length (ft)	800		415		350	195		195	240		300
Base Capacity (vph)	277	3320	177	4375	1223	422	445	493	247	134	2787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.26	0.55	0.70	0.04	0.05	0.05	0.04	0.66	1.01	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	750	30	90	2800	40	20	20	20	150	125	950
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.94	0.91		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	5056		1770	6408	1583	1770	1863	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	5056		1770	6408	1583	1770	1863	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	815	33	98	3043	43	22	22	22	163	136	1033
RTOR Reduction (vph)	0	1	0	0	0	11	0	0	21	0	0	0
Lane Group Flow (vph)	272	847	0	98	3043	32	22	22	1	163	136	1033
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Free
Protected Phases	1	6		5	2	8	7	7		8	8	
Permitted Phases						2			7			Free
Actuated Green, G (s)	10.0	116.8		14.7	121.5	134.5	7.5	7.5	7.5	13.0	13.0	180.0
Effective Green, g (s)	10.0	116.8		14.7	121.5	134.5	7.5	7.5	7.5	13.0	13.0	180.0
Actuated g/C Ratio	0.06	0.65		0.08	0.68	0.75	0.04	0.04	0.04	0.07	0.07	1.00
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	277	3280		144	4325	1182	73	77	65	247	134	2787
v/s Ratio Prot	0.05	0.17		c0.06	c0.47	0.00	0.01	0.01		0.05	c0.07	
v/s Ratio Perm						0.02			0.00			c0.37
v/c Ratio	0.98	0.26		0.68	0.70	0.03	0.30	0.29	0.01	0.66	1.01	0.37
Uniform Delay, d1	84.9	13.3		80.4	18.1	5.9	83.7	83.7	82.7	81.3	83.5	0.0
Progression Factor	1.09	0.88		1.18	0.50	1.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.3	0.2		7.5	0.6	0.0	3.2	2.8	0.1	6.9	81.8	0.4
Delay (s)	140.6	12.0		102.6	9.6	8.9	86.9	86.4	82.8	88.2	165.3	0.4
Level of Service	F	B		F	A	A	F	F	F	F	F	A
Approach Delay (s)		43.2			12.5			85.4			28.0	
Approach LOS		D			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	33	870	2554	462	734	571
v/c Ratio	0.35	0.24	0.77	0.18	0.68	0.76
Control Delay	110.7	7.8	5.9	1.4	68.4	67.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.7	7.8	5.9	1.4	68.4	67.3
Queue Length 50th (ft)	20	79	344	36	286	348
Queue Length 95th (ft)	42	121	356	m40	335	429
Internal Link Dist (ft)		3908	1326		784	
Turn Bay Length (ft)	600			800		550
Base Capacity (vph)	95	3601	3330	2557	1081	752
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.24	0.77	0.18	0.68	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	800	2350	425	675	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	0.97	0.91	0.91	0.88	0.94	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	5085	5085	2787	4990	2787
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	5085	5085	2787	4990	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	870	2554	462	734	571
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	33	870	2554	462	734	571
Turn Type	Prot	NA	NA	pt+ov	NA	pm+ov
Protected Phases	1	6	2	2 4	4	1
Permitted Phases						4
Actuated Green, G (s)	4.0	127.5	116.5	162.0	39.0	43.0
Effective Green, g (s)	4.0	127.5	116.5	162.0	39.0	43.0
Actuated g/C Ratio	0.02	0.71	0.65	0.90	0.22	0.24
Clearance Time (s)	7.0	6.5	6.5		7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0		3.5	3.0
Lane Grp Cap (vph)	76	3601	3291	2508	1081	774
v/s Ratio Prot	0.01	0.17	c0.50	0.17	0.15	c0.02
v/s Ratio Perm						0.19
v/c Ratio	0.43	0.24	0.78	0.18	0.68	0.74
Uniform Delay, d1	86.9	9.2	22.5	1.1	64.8	63.3
Progression Factor	1.17	0.83	0.22	1.29	1.00	1.00
Incremental Delay, d2	3.8	0.2	1.1	0.0	1.8	3.7
Delay (s)	105.8	7.8	6.0	1.4	66.5	67.0
Level of Service	F	A	A	A	E	E
Approach Delay (s)		11.4	5.3		66.7	
Approach LOS		B	A		E	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	1277	217	43	1957	87	528	261	98	11	11
v/c Ratio	0.20	0.57	0.18	0.48	0.79	0.11	0.86	0.85	0.34	0.04	0.03
Control Delay	88.0	38.3	29.5	100.3	42.0	3.5	85.4	93.9	67.7	61.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.0	38.3	29.5	100.3	42.0	3.5	85.4	93.9	67.7	61.0	0.2
Queue Length 50th (ft)	13	455	114	50	671	0	332	325	102	11	0
Queue Length 95th (ft)	m30	496	152	98	828	27	410	#482	167	32	0
Internal Link Dist (ft)		1326			2726			1066		653	
Turn Bay Length (ft)	345			225		500	1000				125
Base Capacity (vph)	55	2254	1235	97	2491	826	644	323	292	307	352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.57	0.18	0.44	0.79	0.11	0.82	0.81	0.34	0.04	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1175	200	40	1800	80	675	30	20	90	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.88	1.00	0.91	1.00	0.91	0.91		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	2787	1770	5085	1583	3221	1610		1593	1676	1478
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	2787	1770	5085	1583	3221	1610		1593	1676	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1277	217	43	1957	87	734	33	22	98	11	11
RTOR Reduction (vph)	0	0	0	0	0	46	0	2	0	0	0	9
Lane Group Flow (vph)	11	1277	217	43	1957	41	528	259	0	98	11	2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6						3
Actuated Green, G (s)	2.0	78.5	78.5	7.8	84.3	84.3	34.2	34.2		33.0	33.0	33.0
Effective Green, g (s)	2.0	78.5	78.5	7.8	84.3	84.3	34.2	34.2		33.0	33.0	33.0
Actuated g/C Ratio	0.01	0.44	0.44	0.04	0.47	0.47	0.19	0.19		0.18	0.18	0.18
Clearance Time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	19	2217	1215	76	2381	741	611	305		292	307	270
v/s Ratio Prot	0.01	0.25		c0.02	c0.38		c0.16	0.16		c0.06	0.01	
v/s Ratio Perm			0.08			0.03						0.00
v/c Ratio	0.58	0.58	0.18	0.57	0.82	0.05	0.86	0.85		0.34	0.04	0.01
Uniform Delay, d1	88.6	38.2	31.0	84.4	41.4	26.1	70.6	70.4		64.0	60.4	60.1
Progression Factor	0.94	0.97	0.92	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.2	1.0	0.3	11.2	3.3	0.1	12.5	20.4		3.1	0.2	0.1
Delay (s)	122.4	38.2	28.8	95.6	44.7	26.3	83.2	90.8		67.0	60.6	60.2
Level of Service	F	D	C	F	D	C	F	F		E	E	E
Approach Delay (s)		37.4			45.0			85.7			65.8	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.5
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	NWL	NWT
Lane Group Flow (vph)	76	1141	65	76	1576	380	734	212	435	337
v/c Ratio	0.52	0.57	0.09	0.47	0.78	0.44	0.92	0.38	0.58	0.91
Control Delay	92.7	42.7	0.2	109.0	19.8	2.9	67.4	25.0	36.4	78.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.7	42.7	0.2	109.0	19.8	2.9	67.4	25.0	36.4	78.4
Queue Length 50th (ft)	43	376	0	45	399	22	355	94	156	286
Queue Length 95th (ft)	#80	437	0	77	447	31	#457	167	190	#426
Internal Link Dist (ft)		620			1066			236		883
Turn Bay Length (ft)	410		500	410		1000	200		200	
Base Capacity (vph)	145	1997	719	167	2022	858	799	607	754	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.57	0.09	0.46	0.78	0.44	0.92	0.35	0.58	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	70	1050	60	70	1450	350	675	20	175	400	10	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1612		3433	1592	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.11	1.00		0.63	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	399	1612		2260	1592	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1141	65	76	1576	380	734	22	190	435	11	326
RTOR Reduction (vph)	0	0	39	0	0	229	0	70	0	0	67	0
Lane Group Flow (vph)	76	1141	26	76	1576	151	734	142	0	435	270	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	7.2	66.8	66.8	8.0	67.6	67.6	74.2	51.2		48.5	32.5	
Effective Green, g (s)	7.2	66.8	66.8	8.0	67.6	67.6	74.2	51.2		48.5	32.5	
Actuated g/C Ratio	0.04	0.39	0.39	0.05	0.40	0.40	0.44	0.30		0.29	0.19	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	145	1998	622	161	2022	629	793	485		755	304	
v/s Ratio Prot	c0.02	0.22		0.02	c0.31		c0.19	0.09		0.05	0.17	
v/s Ratio Perm			0.02			0.10	c0.21			0.11		
v/c Ratio	0.52	0.57	0.04	0.47	0.78	0.24	0.93	0.29		0.58	0.89	
Uniform Delay, d1	79.7	40.4	31.8	78.9	44.7	34.1	51.6	45.5		49.8	67.0	
Progression Factor	1.00	1.00	1.00	1.27	0.37	0.44	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	1.2	0.1	2.0	2.8	0.8	16.5	0.3		1.1	25.2	
Delay (s)	83.1	41.6	32.0	102.1	19.3	15.7	68.1	45.9		50.8	92.2	
Level of Service	F	D	C	F	B	B	E	D		D	F	
Approach Delay (s)		43.6			21.7			63.1			68.9	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	2120	2065	11
v/c Ratio	0.43	0.44	0.14
Control Delay	1.7	0.4	82.3
Queue Delay	0.0	0.0	0.0
Total Delay	1.7	0.4	82.3
Queue Length 50th (ft)	0	2	12
Queue Length 95th (ft)	197	5	35
Internal Link Dist (ft)	1066	1427	679
Turn Bay Length (ft)			
Base Capacity (vph)	4902	4733	291
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.43	0.44	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1950	1900	0	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)		-3%	4%		0%	
Total Lost time (s)		6.5	6.5		7.0	
Lane Util. Factor		0.91	0.91		1.00	
Frt		1.00	1.00		1.00	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		5162	4984		1770	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		5162	4984		1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2120	2065	0	11	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2120	2065	0	11	0
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		153.3	153.3		3.2	
Effective Green, g (s)		153.3	153.3		3.2	
Actuated g/C Ratio		0.90	0.90		0.02	
Clearance Time (s)		6.5	6.5		7.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		4654	4494		33	
v/s Ratio Prot		0.41	c0.41		c0.01	
v/s Ratio Perm						
v/c Ratio		0.46	0.46		0.33	
Uniform Delay, d1		1.4	1.4		82.3	
Progression Factor		1.46	0.19		1.00	
Incremental Delay, d2		0.2	0.2		5.9	
Delay (s)		2.2	0.5		88.2	
Level of Service		A	A		F	
Approach Delay (s)		2.2	0.5		88.2	
Approach LOS		A	A		F	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

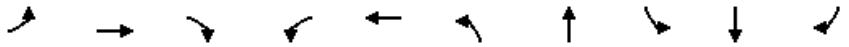
Lane Group	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	310	225	375	925	300	625
v/c Ratio	0.91	0.87	0.62	0.76	0.84	0.32
Control Delay	88.0	93.2	6.4	46.4	50.9	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.0	93.2	6.4	46.4	50.9	19.9
Queue Length 50th (ft)	290	216	0	423	197	180
Queue Length 95th (ft)	#453	#356	33	512	#330	223
Internal Link Dist (ft)	979		481	906		768
Turn Bay Length (ft)					250	
Base Capacity (vph)	362	271	615	1221	389	1931
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.83	0.61	0.76	0.77	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	150	60	225	0	375	0	625	300	300	625	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor		1.00		1.00	1.00			0.95		1.00	0.95	
Frt		0.97		1.00	0.85			0.95		1.00	1.00	
Flt Protected		0.98		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1785		1770	1583			3367		1770	3539	
Flt Permitted		0.98		0.95	1.00			1.00		0.12	1.00	
Satd. Flow (perm)		1785		1770	1583			3367		223	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	150	60	225	0	375	0	625	300	300	625	0
RTOR Reduction (vph)	0	6	0	0	320	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	304	0	225	55	0	0	889	0	300	625	0
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		28.2		21.9	21.9			52.8		81.9	81.9	
Effective Green, g (s)		28.2		21.9	21.9			52.8		81.9	81.9	
Actuated g/C Ratio		0.19		0.15	0.15			0.35		0.55	0.55	
Clearance Time (s)		6.0		6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		335		258	231			1185		359	1932	
v/s Ratio Prot		c0.17		c0.13	0.03			0.26		c0.13	0.18	
v/s Ratio Perm										c0.33		
v/c Ratio		0.91		0.87	0.24			0.75		0.84	0.32	
Uniform Delay, d1		59.6		62.7	56.7			42.8		35.3	18.8	
Progression Factor		1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2		27.0		26.0	0.5			4.4		15.4	0.4	
Delay (s)		86.7		88.6	57.2			47.2		50.6	19.2	
Level of Service		F		F	E			D		D	B	
Approach Delay (s)		86.7			69.0			47.2			29.4	
Approach LOS		F			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	272	1603	380	33	1364	408	527	190	245	136
v/c Ratio	1.05	1.14	0.46	0.63	1.02	0.47	1.14	0.36	0.86	0.34
Control Delay	139.8	122.5	17.5	126.8	90.1	56.7	142.0	65.9	96.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.8	122.5	17.5	126.8	90.1	56.7	142.0	65.9	96.6	4.6
Queue Length 50th (ft)	~334	~1149	128	37	~586	203	~706	97	267	0
Queue Length 95th (ft)	#530	#1278	179	#97	#684	262	#960	138	#388	21
Internal Link Dist (ft)		937			1943		2110		622	
Turn Bay Length (ft)	485		510	610		160		250		300
Base Capacity (vph)	260	1407	828	52	1336	866	461	585	317	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.14	0.46	0.63	1.02	0.47	1.14	0.32	0.77	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1475	350	30	1175	80	375	425	60	175	225	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.97	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	5037		3433	1828		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	5037		3433	1828		3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1603	380	33	1277	87	408	462	65	190	245	136
RTOR Reduction (vph)	0	0	202	0	4	0	0	0	0	0	0	115
Lane Group Flow (vph)	272	1603	178	33	1360	0	408	527	0	190	245	21
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	7		3	3		6	6	
Permitted Phases			2									6
Actuated Green, G (s)	26.6	66.0	66.0	4.0	43.4		42.9	42.9		26.1	26.1	26.1
Effective Green, g (s)	26.6	66.0	66.0	4.0	43.4		42.9	42.9		26.1	26.1	26.1
Actuated g/C Ratio	0.16	0.39	0.39	0.02	0.26		0.25	0.25		0.15	0.15	0.15
Clearance Time (s)	8.0	8.0	8.0	8.0	8.0		7.0	7.0		8.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	276	1373	614	41	1285		866	461		527	286	243
v/s Ratio Prot	0.15	c0.45		0.02	c0.27		0.12	c0.29		0.06	c0.13	
v/s Ratio Perm			0.11									0.01
v/c Ratio	0.99	1.17	0.29	0.80	1.06		0.47	1.14		0.36	0.86	0.09
Uniform Delay, d1	71.5	52.0	35.8	82.6	63.3		53.9	63.5		64.5	70.1	61.7
Progression Factor	1.11	1.16	2.65	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	47.9	83.1	1.1	69.0	42.0		0.4	87.4		0.4	21.5	0.2
Delay (s)	127.0	143.5	95.9	151.6	105.3		54.3	151.0		64.9	91.6	61.9
Level of Service	F	F	F	F	F		D	F		E	F	E
Approach Delay (s)		133.5			106.4			108.8			75.6	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	115.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	80	525	150	575	500	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	80	525	150	575	500	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1375	500	500			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1375	500	500			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	42	8	86			
cM capacity (veh/h)	138	571	1064			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	605	150	575	500	70
Volume Left	80	150	0	0	0
Volume Right	525	0	0	0	70
cSH	403	1064	1700	1700	1700
Volume to Capacity	1.50	0.14	0.34	0.29	0.04
Queue Length 95th (ft)	807	12	0	0	0
Control Delay (s)	263.6	8.9	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	263.6	1.8		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	84.6		
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

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Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	10	20	20	40	60	1125	30	100	2675	275
v/c Ratio	0.98	0.07	0.09	0.44	0.28	0.69	0.44	0.03	0.29	0.97	0.29
Control Delay	156.7	82.4	0.8	120.5	4.8	67.2	11.5	0.0	6.7	36.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.1	0.0
Total Delay	156.7	82.4	0.8	120.5	4.8	67.2	11.5	0.0	6.7	61.1	4.9
Queue Length 50th (ft)	159	12	0	25	0	25	293	0	26	1596	48
Queue Length 95th (ft)	#312	36	0	#62	0	#111	335	0	41	#1884	89
Internal Link Dist (ft)		602		1004			953			1235	
Turn Bay Length (ft)	80		80			360		390	380		
Base Capacity (vph)	128	142	216	45	143	87	2542	1161	348	2753	941
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	227	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.07	0.09	0.44	0.28	0.69	0.44	0.03	0.29	1.06	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	10	20	10	10	40	60	1125	30	100	2675	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	2050	1900
Grade (%)		2%			1%			0%			0%	
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624	1809	1508		1740	1516	1752	3505	1562	1752	3774	1237
Flt Permitted	0.95	1.00	1.00		0.98	1.00	0.03	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1624	1809	1508		1740	1516	54	3505	1562	400	3774	1237
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	10	20	10	10	40	60	1125	30	100	2675	275
RTOR Reduction (vph)	0	0	18	0	0	39	0	0	8	0	0	40
Lane Group Flow (vph)	125	10	2	0	20	1	60	1125	22	100	2675	235
Heavy Vehicles (%)	10%	4%	6%	6%	6%	6%	3%	3%	3%	3%	3%	30%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	1	0	1	1
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4	6		6	2		2
Actuated Green, G (s)	15.0	15.0	15.0		4.0	4.0	141.7	136.4	136.4	143.3	137.2	137.2
Effective Green, g (s)	15.0	15.0	15.0		4.0	4.0	141.7	136.4	136.4	143.3	137.2	137.2
Actuated g/C Ratio	0.08	0.08	0.08		0.02	0.02	0.75	0.72	0.72	0.75	0.72	0.72
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.5	7.5	7.0	7.5	7.5
Vehicle Extension (s)	7.0	7.0	7.0		3.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	128	142	119		36	31	87	2516	1121	345	2725	893
v/s Ratio Prot	c0.08	0.01			c0.01		c0.02	0.32		0.01	c0.71	
v/s Ratio Perm			0.00			0.00	0.49		0.01	0.21		0.19
v/c Ratio	0.98	0.07	0.01		0.56	0.03	0.69	0.45	0.02	0.29	0.98	0.26
Uniform Delay, d1	87.3	81.0	80.7		92.1	91.1	57.6	11.1	7.7	7.4	25.2	9.1
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	73.3	0.7	0.2		17.3	0.4	20.4	0.6	0.0	0.5	13.4	0.7
Delay (s)	160.6	81.8	80.8		109.4	91.5	78.0	11.7	7.7	7.8	38.6	9.8
Level of Service	F	F	F		F	F	E	B	A	A	D	A
Approach Delay (s)		145.2			97.4			14.9			35.0	
Approach LOS		F			F			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	28.5
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	20	27	107	106	10	700	350	1625	650	30
v/c Ratio	0.18	0.32	0.35	0.68	0.11	0.19	0.75	0.65	0.87	0.23	0.02
Control Delay	131.1	88.0	131.4	46.4	4.5	131.4	88.7	49.8	51.3	5.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.1	88.0	131.4	46.4	4.5	131.4	88.7	49.8	51.3	5.9	0.0
Queue Length 50th (ft)	17	17	48	24	12	17	586	303	1164	132	0
Queue Length 95th (ft)	46	57	95	115	43	46	694	457	1336	176	0
Internal Link Dist (ft)		1005		682			1789			2364	
Turn Bay Length (ft)	170		310			390		390	470		495
Base Capacity (vph)	55	63	129	200	1125	54	1021	570	2176	2959	1335
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.32	0.21	0.54	0.09	0.19	0.69	0.61	0.75	0.22	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	30	10	200	10	700	350	1625	650	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.93		1.00	0.87	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1740		1732	1514	1550	1752	3504	1567	3399	3504	1567
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1740		1732	1514	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	10	10	30	10	200	10	700	350	1625	650	30
RTOR Reduction (vph)	0	10	0	0	90	36	0	0	116	0	0	6
Lane Group Flow (vph)	10	10	0	27	17	70	10	700	234	1625	650	24
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	5.2	5.2		10.6	10.6	141.0	3.8	66.3	66.3	130.4	192.9	192.9
Effective Green, g (s)	5.2	5.2		10.6	10.6	141.0	3.8	66.3	66.3	130.4	192.9	192.9
Actuated g/C Ratio	0.02	0.02		0.04	0.04	0.59	0.02	0.28	0.28	0.54	0.80	0.80
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	38	37		76	66	953	27	965	431	1842	2810	1256
v/s Ratio Prot	0.01	c0.01		c0.02	0.01	0.04	0.01	c0.20		c0.48	0.19	
v/s Ratio Perm						0.01			0.15			0.02
v/c Ratio	0.26	0.28		0.36	0.26	0.07	0.37	0.73	0.54	0.88	0.23	0.02
Uniform Delay, d1	115.8	115.8		111.6	111.2	21.5	117.2	78.9	74.2	48.3	5.8	4.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	4.0		2.8	2.1	0.0	8.4	3.4	2.5	5.5	0.1	0.0
Delay (s)	119.4	119.8		114.5	113.2	21.6	125.5	82.2	76.7	53.8	5.9	4.8
Level of Service	F	F		F	F	C	F	F	E	D	A	A
Approach Delay (s)		119.7			72.9			80.8			39.7	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	240.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBU	SBT	SBR
Lane Group Flow (vph)	1175	10	2325	10	500	300
v/c Ratio	0.95	0.02	0.85	0.23	0.17	0.29
Control Delay	77.0	1.4	23.5	89.3	39.7	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	1.4	23.5	89.3	39.7	22.7
Queue Length 50th (ft)	764	0	829	13	182	161
Queue Length 95th (ft)	865	3	1063	m40	206	228
Internal Link Dist (ft)	1564		126		1018	
Turn Bay Length (ft)				315		
Base Capacity (vph)	1278	609	2741	44	2863	1022
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.02	0.85	0.23	0.17	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	1175	10	0	2325	10	500	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.0		7.5	7.0	7.5	7.5
Lane Util. Factor	0.97	1.00		0.91	1.00	0.91	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1583		5085	1770	5085	1583
Flt Permitted	0.95	1.00		1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1583		5085	1770	5085	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1175	10	0	2325	10	500	300
RTOR Reduction (vph)	0	6	0	0	0	0	131
Lane Group Flow (vph)	1175	4	0	2325	10	500	169
Turn Type	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	4	1	1	6	5	2	
Permitted Phases		4					2
Actuated Green, G (s)	72.4	72.4		103.6	2.0	112.6	112.6
Effective Green, g (s)	72.4	72.4		103.6	2.0	112.6	112.6
Actuated g/C Ratio	0.36	0.36		0.52	0.01	0.56	0.56
Clearance Time (s)	7.5	7.0		7.5	7.0	7.5	7.5
Vehicle Extension (s)	3.0	3.0		4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	1242	573		2634	17	2862	891
v/s Ratio Prot	c0.34			c0.46	0.01	0.10	
v/s Ratio Perm		0.00					c0.11
v/c Ratio	0.95	0.01		0.88	0.59	0.17	0.19
Uniform Delay, d1	61.9	40.8		42.8	98.6	21.2	21.4
Progression Factor	1.00	1.00		0.52	0.81	1.84	11.61
Incremental Delay, d2	14.4	0.0		3.3	42.6	0.1	0.5
Delay (s)	76.3	40.8		25.4	122.4	39.1	248.7
Level of Service	E	D		C	F	D	F
Approach Delay (s)	76.0			25.4		117.8	
Approach LOS	E			C		F	

Intersection Summary			
HCM 2000 Control Delay	56.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	848	98	3043	43	22	22	22	163	136	1033
v/c Ratio	1.26	0.25	0.68	0.84	0.03	0.25	0.24	0.10	0.86	1.32	0.37
Control Delay	221.0	10.7	107.5	10.2	0.3	88.7	87.8	0.9	119.2	255.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	221.0	10.7	107.5	10.2	0.3	88.7	87.8	0.9	119.2	255.6	0.4
Queue Length 50th (ft)	~128	113	0	347	0	26	26	0	100	~206	0
Queue Length 95th (ft)	#197	128	m153	510	m1	59	59	0	#171	#362	0
Internal Link Dist (ft)		1154		740			701			434	
Turn Bay Length (ft)	800		415		350	195		195	240		300
Base Capacity (vph)	194	3404	177	3641	1248	422	445	493	190	103	2787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.25	0.55	0.84	0.03	0.05	0.05	0.04	0.86	1.32	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	750	30	90	2800	40	20	20	20	150	125	950
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0
Lane Util. Factor	0.94	0.91		1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	5056		1770	5085	1583	1770	1863	1583	3433	1863	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	5056		1770	5085	1583	1770	1863	1583	3433	1863	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	815	33	98	3043	43	22	22	22	163	136	1033
RTOR Reduction (vph)	0	1	0	0	0	10	0	0	21	0	0	0
Lane Group Flow (vph)	245	847	0	98	3043	33	22	22	1	163	136	1033
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Free
Protected Phases	1	6		5	2	8	7	7		8	8	
Permitted Phases						2			7			Free
Actuated Green, G (s)	7.0	119.8		14.7	127.5	137.5	7.5	7.5	7.5	10.0	10.0	180.0
Effective Green, g (s)	7.0	119.8		14.7	127.5	137.5	7.5	7.5	7.5	10.0	10.0	180.0
Actuated g/C Ratio	0.04	0.67		0.08	0.71	0.76	0.04	0.04	0.04	0.06	0.06	1.00
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	194	3365		144	3601	1209	73	77	65	190	103	2787
v/s Ratio Prot	c0.05	0.17		0.06	c0.60	0.00	0.01	0.01		0.05	c0.07	
v/s Ratio Perm						0.02			0.00			c0.37
v/c Ratio	1.26	0.25		0.68	0.85	0.03	0.30	0.29	0.01	0.86	1.32	0.37
Uniform Delay, d1	86.5	12.1		80.4	19.1	5.1	83.7	83.7	82.7	84.3	85.0	0.0
Progression Factor	1.10	0.85		1.17	0.45	1.66	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	152.3	0.2		7.5	1.5	0.0	3.2	2.8	0.1	30.6	196.9	0.4
Delay (s)	247.7	10.5		101.5	10.2	8.5	86.9	86.4	82.8	114.9	281.9	0.4
Level of Service	F	B		F	B	A	F	F	F	F	F	A
Approach Delay (s)		63.7			12.9			85.4			43.1	
Approach LOS		E			B			F			D	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	1304	217	43	1929	87	734	55	98	11	11
v/c Ratio	0.21	0.64	0.19	0.48	0.84	0.11	0.93	0.13	0.34	0.04	0.03
Control Delay	89.4	44.8	34.5	100.3	48.7	3.9	86.5	39.5	67.7	61.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.4	44.8	34.5	100.3	48.7	3.9	86.5	39.5	67.7	61.0	0.2
Queue Length 50th (ft)	13	470	116	50	703	0	441	36	102	11	0
Queue Length 95th (ft)	m29	511	157	98	861	29	#554	79	167	32	0
Internal Link Dist (ft)		1326			2726			1066		653	
Turn Bay Length (ft)	345			225		500	1000				125
Base Capacity (vph)	52	2052	1125	97	2290	767	801	421	292	307	352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.64	0.19	0.44	0.84	0.11	0.92	0.13	0.34	0.04	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1200	200	40	1775	80	675	30	20	90	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	9	9	10
Total Lost time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.88	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	2787	1770	5085	1583	3433	1751		1593	1676	1478
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	2787	1770	5085	1583	3433	1751		1593	1676	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1304	217	43	1929	87	734	33	22	98	11	11
RTOR Reduction (vph)	0	0	0	0	0	50	0	13	0	0	0	9
Lane Group Flow (vph)	11	1304	217	43	1929	37	734	42	0	98	11	2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6						3
Actuated Green, G (s)	2.0	71.4	71.4	7.8	77.2	77.2	41.3	41.3		33.0	33.0	33.0
Effective Green, g (s)	2.0	71.4	71.4	7.8	77.2	77.2	41.3	41.3		33.0	33.0	33.0
Actuated g/C Ratio	0.01	0.40	0.40	0.04	0.43	0.43	0.23	0.23		0.18	0.18	0.18
Clearance Time (s)	6.5	7.0	7.0	6.5	7.0	7.0	6.0	6.0		7.0	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	19	2017	1105	76	2180	678	787	401		292	307	270
v/s Ratio Prot	0.01	0.26		c0.02	c0.38		c0.21	0.02		c0.06	0.01	
v/s Ratio Perm			0.08			0.02						0.00
v/c Ratio	0.58	0.65	0.20	0.57	0.88	0.06	0.93	0.10		0.34	0.04	0.01
Uniform Delay, d1	88.6	44.1	35.5	84.4	47.3	30.1	68.0	54.8		64.0	60.4	60.1
Progression Factor	0.94	0.98	0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.2	1.5	0.4	11.2	5.7	0.2	17.9	0.2		3.1	0.2	0.1
Delay (s)	122.6	44.8	34.0	95.6	53.0	30.2	85.9	54.9		67.0	60.6	60.2
Level of Service	F	D	C	F	D	C	F	D		E	E	E
Approach Delay (s)		43.9			53.0			83.8			65.8	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	55.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	272	1576	380	33	1277	87	408	527	190	245	136
v/c Ratio	0.90	0.89	0.48	0.60	0.92	0.17	0.39	0.96	0.36	0.86	0.34
Control Delay	106.2	60.6	14.6	120.9	70.8	2.2	48.3	86.1	65.9	96.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	60.6	14.6	120.9	70.8	2.2	48.3	86.1	65.9	96.6	4.6
Queue Length 50th (ft)	159	651	110	37	520	0	185	575	97	267	0
Queue Length 95th (ft)	#246	#750	212	#97	#620	12	239	#823	138	#388	21
Internal Link Dist (ft)		937			1943			2110		622	
Turn Bay Length (ft)	485		510	610		1000	160		250		300
Base Capacity (vph)	302	1767	798	55	1393	526	1050	559	585	317	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.89	0.48	0.60	0.92	0.17	0.39	0.94	0.32	0.77	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1450	350	30	1175	80	375	425	60	175	225	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0		8.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1828		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1828		3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1576	380	33	1277	87	408	462	65	190	245	136
RTOR Reduction (vph)	0	0	251	0	0	64	0	0	0	0	0	115
Lane Group Flow (vph)	272	1576	129	33	1277	23	408	527	0	190	245	21
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	7		3	3		6	6	
Permitted Phases			2			7						6
Actuated Green, G (s)	16.6	57.5	57.5	4.1	45.0	45.0	51.3	51.3		26.1	26.1	26.1
Effective Green, g (s)	16.6	57.5	57.5	4.1	45.0	45.0	51.3	51.3		26.1	26.1	26.1
Actuated g/C Ratio	0.10	0.34	0.34	0.02	0.26	0.26	0.30	0.30		0.15	0.15	0.15
Clearance Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0		8.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	335	1719	535	42	1346	419	1035	551		527	286	243
v/s Ratio Prot	0.08	c0.31		0.02	c0.25		0.12	c0.29		0.06	c0.13	
v/s Ratio Perm			0.08			0.01						0.01
v/c Ratio	0.81	0.92	0.24	0.79	0.95	0.05	0.39	0.96		0.36	0.86	0.09
Uniform Delay, d1	75.2	54.0	40.5	82.5	61.4	46.6	47.0	58.3		64.5	70.1	61.7
Progression Factor	1.01	1.01	3.47	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.0	8.7	1.0	62.3	15.0	0.2	0.2	27.5		0.4	21.5	0.2
Delay (s)	88.7	63.2	141.4	144.8	76.4	46.9	47.3	85.7		64.9	91.6	61.9
Level of Service	F	E	F	F	E	D	D	F		E	F	E
Approach Delay (s)		79.7			76.1			69.0			75.6	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Existing Merge-Diverge-Weave – AM & PM

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Site 28
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing AM	Analysis Year	
Project Description	SB Fairfaxy Co Pkwy Diverge at Franconia Springfield Pkwy		

Inputs

Upstream Adj Ramp		Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	5098	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	1683	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5098	0.98	Level	2	0	0.990	1.00	5254
Ramp	1683	0.98	Level	2	0	0.990	1.00	1735
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 3319 pc/h

V_3 or V_{av34} 1935 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5254	Exhibit 13-8	6750	No
$V_{FO} = V_F - V_R$	3519	Exhibit 13-8	6750	No
V_R	1735	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3319	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.584 (Exhibit 13-12)

S_R = 47.4 mph (Exhibit 13-12)

S_0 = 56.7 mph (Exhibit 13-12)

S = 50.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Site 28
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing PM	Analysis Year	

Project Description SB Fairfaxy Co Pkwy Diverge at Franconia Springfield Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1933	V_D = veh/h
	Ramp Volume, V_R: 470	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1933	0.98	Level	2	0	0.990	1.00	1992
Ramp	470	0.98	Level	2	0	0.990	1.00	484
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 1163 pc/h

V_3 or V_{av34} 829 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1992	Exhibit 13-8	6750	No
$V_{FO} = V_F - V_R$	1508	Exhibit 13-8	6750	No
V_R	484	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1163	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 12.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.472 (Exhibit 13-12)

S_R = 48.9 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 53.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gusrtavo Cuentas	Freeway/Dir of Travel	WB Franconia Springfield Pkwy
Agency or Company	Dewberry	Junction	Site 29
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing AM	Analysis Year	

Project Description: NB Fffx Co Pkwy Merge to WB Franconia Springfield Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 700	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 857	V_D = veh/h
	Ramp Volume, V_R: 654	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	857	0.98	Level	2	0	0.990	1.00	883
Ramp	654	0.98	Level	2	0	0.990	1.00	674
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 527 pc/h

V_3 or V_{av34} = 356 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1557	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1201	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 10.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.285 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = 55.0 mph (Exhibit 13-11)

S = 52.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gusrtavo Cuentas	Freeway/Dir of Travel	WB Franconia Springfield Pkwy
Agency or Company	Dewberry	Junction	Site 29
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing PM	Analysis Year	

Project Description NB Fffx Co Pkwy Merge to WB Franconia Springfield Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 700	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2940	V_D = veh/h
	Ramp Volume, V_R: 1667	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2940	0.98	Level	2	0	0.990	1.00	3030
Ramp	1667	0.98	Level	2	0	0.990	1.00	1718
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 1809 pc/h

V_3 or V_{av34} = 1221 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4748	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3527	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.405 (Exibit 13-11)

S_R = 49.7 mph (Exhibit 13-11)

S_0 = 52.4 mph (Exhibit 13-11)

S = 50.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 37
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing AM	Analysis Year	

Project Description SB Barta Rd Merge to SB Fairfax Co Pkwy - Site 37

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1355	V_D = veh/h
	Ramp Volume, V_R: 59	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1355	0.98	Level	2	0	0.990	1.00	1396
Ramp	59	0.98	Level	2	0	0.990	1.00	61
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1396 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1457	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1457	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 1.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.163 (Exibit 13-11)

S_R = 52.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 52.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 37
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing PM	Analysis Year	

Project Description SB Barta Rd Merge to SB Fairfax Co Pkwy - Site 37

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 220	V_D = veh/h
	Ramp Volume, V_R: 258	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	220	0.98	Level	2	0	0.990	1.00	227
Ramp	258	0.98	Level	2	0	0.990	1.00	266
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 227 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	493	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	493	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = -6.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.152 (Exibit 13-11)

S_R = 53.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 38a
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing AM	Analysis Year	

Project Description SB Fairfax Co Pkwy Diverge to Barta Rd - Site 38a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2291	V_D = veh/h
	Ramp Volume, V_R: 936	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2291	0.98	Level	2	0	0.990	1.00	2361
Ramp	936	0.98	Level	2	0	0.990	1.00	965
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 1328 pc/h

V_3 or V_{av34} 516 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2361	Exhibit 13-8	9000	No
$V_{FO} = V_F - V_R$	1396	Exhibit 13-8	9000	No
V_R	965	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1328	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 12.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.515 (Exhibit 13-12)

S_R = 48.3 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 52.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 38a
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	Existing PM	Analysis Year	

Project Description SB Fairfax Co Pkwy Diverge to Barta Rd - Site 38a

Inputs

Upstream Adj Ramp		Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	822	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	602	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	822	0.98	Level	2	0	0.990	1.00	847
Ramp	602	0.98	Level	2	0	0.990	1.00	620
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 679 pc/h

V_3 or V_{av34} 84 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	847	Exhibit 13-8	9000	No
$V_{FO} = V_F - V_R$	227	Exhibit 13-8	9000	No
V_R	620	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	679	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 6.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.484 (Exhibit 13-12)

S_R = 48.7 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 50.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Fairfax County Pkwy & Barta Rd
Date Performed	1/8/2014	Jurisdiction	Site 39a
Analysis Time Period	Existing AM	Analysis Year	

Project Description: Merge from SB Barta Rd to NB Fairfax Country Pkwy - Site 39a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 750	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 980	V_D = veh/h
	Ramp Volume, V_R: 55	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	980	0.98	Level	2	0	0.990	1.00	1010
Ramp	55	0.98	Level	2	0	0.990	1.00	57
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 604 pc/h

V_3 or V_{av34} = 406 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1067	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	661	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 5.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.276 (Exibit 13-11)

S_R = 51.4 mph (Exhibit 13-11)

S_0 = 55.0 mph (Exhibit 13-11)

S = 52.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Fairfax County Pkwy & Barta Rd
Date Performed	1/8/2014	Jurisdiction	Site 39a
Analysis Time Period	Existing PM	Analysis Year	

Project Description: Merge from SB Barta Rd to NB Fairfax Country Pkwy - Site 39a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 750	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1668	V_D = veh/h
	Ramp Volume, V_R: 485	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1668	0.98	Level	2	0	0.990	1.00	1719
Ramp	485	0.98	Level	2	0	0.990	1.00	500
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1029 pc/h

V_3 or V_{av34} = 690 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2219	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1529	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.286 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = 54.3 mph (Exhibit 13-11)

S = 52.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Gustavo Cuentas*
Agency or Company	*Dewberry*
Date Performed	*1/9/2014*
Analysis Time Period	*Existing AM*

Site Information

Highway/Direction of Travel	*NB Fairfax County Pkwy*
From/To	
Jurisdiction	*Site 40*
Analysis Year	

Project Description *NB Fairfax County Pkwy at Loop Ramp from Barta Rd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*980*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*55.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*55.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*337*	pc/h/ln
S	*55.0*	mph
D = v_p / S	*6.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Gustavo Cuentas*
Agency or Company	*Dewberry*
Date Performed	*1/9/2014*
Analysis Time Period	*Existing PM*

Site Information

Highway/Direction of Travel	*NB Fairfax County Pkwy*
From/To	
Jurisdiction	*Site 40*
Analysis Year	

Project Description *NB Fairfax County Pkwy at Loop Ramp from Barta Rd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1668*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*55.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*55.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*573*	pc/h/ln
S	*55.0*	mph
D = v_p / S	*10.4*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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Weave between Rolling Rd and Boudinot Dr Site 41

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing AM

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 41
Analysis Year	

Project Description *Weave between Rolling Rd and Boudinot Dr Site 41*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	1600ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1155	0.98	2	0	1.5	1.2	0.990	1.00	1190
V_{RF}	347	0.98	2	0	1.5	1.2	0.990	1.00	358
V_{FR}	259	0.98	2	0	1.5	1.2	0.990	1.00	267
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1190							V =	1815
V_W	625								
VR	0.344								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	625 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	936 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	342 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1278 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	95

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1815 pc/h	Weaving intensity factor, W	0.189
Weaving segment capacity, c_w	6901 veh/h	Weaving segment speed, S	43.7 mph
Weaving segment v/c ratio	0.260	Average weaving speed, S_W	44.4 mph
Weaving segment density, D	10.4 pc/mi/ln	Average non-weaving speed, S_{NW}	43.3 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	6065 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Rolling Rd and Boudinot Dr Site 41

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing PM

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 41
Analysis Year	

Project Description *Weave between Rolling Rd and Boudinot Dr Site 41*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	1600ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	409	0.98	2	0	1.5	1.2	0.990	1.00	422
V_{RF}	176	0.98	2	0	1.5	1.2	0.990	1.00	181
V_{FR}	69	0.98	2	0	1.5	1.2	0.990	1.00	71
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	422							V =	674
V_W	252								
VR	0.374								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	252 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	563 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	184 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	747 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	34

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	674 pc/h	Weaving intensity factor, W	0.124
Weaving segment capacity, c_w	6355 veh/h	Weaving segment speed, S	46.9 mph
Weaving segment v/c ratio	0.105	Average weaving speed, S_W	46.1 mph
Weaving segment density, D	3.6 pc/mi/ln	Average non-weaving speed, S_{NW}	47.4 mph
Level of Service, LOS	A	Maximum weaving length, L_{MAX}	6390 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing PM

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 44
Analysis Year	

Project Description *NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	475ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	899	0.98	2	0	1.5	1.2	0.990	1.00	927
V_{RF}	328	0.98	2	0	1.5	1.2	0.990	1.00	338
V_{FR}	897	0.98	2	0	1.5	1.2	0.990	1.00	924
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	927							V =	2189
V_W	1262								
VR	0.577								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1262 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1376 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1376 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	22

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2189 pc/h	Weaving intensity factor, W	0.523
Weaving segment capacity, c_w	4122 veh/h	Weaving segment speed, S	38.1 mph
Weaving segment v/c ratio	0.526	Average weaving speed, S_W	38.0 mph
Weaving segment density, D	14.4 pc/mi/ln	Average non-weaving speed, S_{NW}	38.3 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	8734 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing AM

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 44
Analysis Year	

Project Description *NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	475ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	358	0.98	2	0	1.5	1.2	0.990	1.00	369
V_{RF}	348	0.98	2	0	1.5	1.2	0.990	1.00	359
V_{FR}	680	0.98	2	0	1.5	1.2	0.990	1.00	701
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	369							V =	1429
V_W	1060								
VR	0.742								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1060 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1174 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1174 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	9

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1429 pc/h	Weaving intensity factor, W	0.461
Weaving segment capacity, c_w	3203 veh/h	Weaving segment speed, S	39.4 mph
Weaving segment v/c ratio	0.442	Average weaving speed, S_W	38.9 mph
Weaving segment density, D	9.1 pc/mi/ln	Average non-weaving speed, S_{NW}	40.7 mph
Level of Service, LOS	A	Maximum weaving length, L_{MAX}	10786 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing AM

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	825ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1118	0.98	2	0	1.5	1.2	0.990	1.00	1152
V_{RF}	781	0.98	2	0	1.5	1.2	0.990	1.00	805
V_{FR}	565	0.98	2	0	1.5	1.2	0.990	1.00	582
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1152							V =	2539
V_W	1387								
VR	0.546								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1387 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1498 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	107 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1605 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	48

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2539 pc/h	Weaving intensity factor, W	0.382
Weaving segment capacity, c_w	4350 veh/h	Weaving segment speed, S	38.2 mph
Weaving segment v/c ratio	0.578	Average weaving speed, S_W	40.3 mph
Weaving segment density, D	22.1 pc/mi/ln	Average non-weaving speed, S_{NW}	36.0 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	8372 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing PM

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	825ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	849	0.98	2	0	1.5	1.2	0.990	1.00	875
V_{RF}	776	0.98	2	0	1.5	1.2	0.990	1.00	800
V_{FR}	741	0.98	2	0	1.5	1.2	0.990	1.00	764
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	875							V =	2439
V_W	1564								
VR	0.641								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1564 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1675 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	50 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1725 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	36

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2439 pc/h	Weaving intensity factor, W	0.404
Weaving segment capacity, c_w	3706 veh/h	Weaving segment speed, S	37.9 mph
Weaving segment v/c ratio	0.652	Average weaving speed, S_W	39.9 mph
Weaving segment density, D	21.4 pc/mi/ln	Average non-weaving speed, S_{NW}	34.8 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	9524 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between NB Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing AM

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between NB Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	425ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	312	0.98	2	0	1.5	1.2	0.990	1.00	322
V_{RF}	545	0.98	2	0	1.5	1.2	0.990	1.00	562
V_{FR}	1162	0.98	2	0	1.5	1.2	0.990	1.00	1198
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	322							V =	2082
V_W	1760								
VR	0.845								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1760 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1814 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1814 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	7

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2082 pc/h	Weaving intensity factor, W	0.710
Weaving segment capacity, c_w	2811 veh/h	Weaving segment speed, S	35.2 mph
Weaving segment v/c ratio	0.733	Average weaving speed, S_W	35.5 mph
Weaving segment density, D	19.7 pc/mi/ln	Average non-weaving speed, S_{NW}	34.0 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	12134 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between NB Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	Existing PM

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between NB Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	425ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	707	0.98	2	0	1.5	1.2	0.990	1.00	729
V_{RF}	277	0.98	2	0	1.5	1.2	0.990	1.00	285
V_{FR}	718	0.98	2	0	1.5	1.2	0.990	1.00	740
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	729							V =	1754
V_W	1025								
VR	0.584								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1025 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1079 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1079 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	15

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1754 pc/h	Weaving intensity factor, W	0.471
Weaving segment capacity, c_w	4066 veh/h	Weaving segment speed, S	39.2 mph
Weaving segment v/c ratio	0.427	Average weaving speed, S_W	38.8 mph
Weaving segment density, D	14.9 pc/mi/ln	Average non-weaving speed, S_{NW}	39.8 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	8829 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Southbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	AM Existing	Analysis Year	
Project Description	SB Fairfax County Parkway Diverge to Telegraph Rd		

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	900	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	2441	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	293	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2441	0.98	Level	2	0	0.990	1.00	2516
Ramp	293	0.98	Level	2	0	0.990	1.00	302
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2516 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2516	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	2214	Exhibit 13-8	4500	No
V_R	302	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2516	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.455 (Exhibit 13-12)

S_R= 49.1 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 49.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Southbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	PM Existing	Analysis Year	
Project Description	SB Fairfax County Parkway Diverge to Telegraph Rd		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 900	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1813	V_D = veh/h
	Ramp Volume, V_R: 775	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1813	0.98	Level	2	0	0.990	1.00	1868
Ramp	775	0.98	Level	2	0	0.990	1.00	799
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1868 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1868	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	1069	Exhibit 13-8	4500	No
V_R	799	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1868	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 12.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.500 (Exhibit 13-12)

S_R= 48.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 48.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	AM Existing	Analysis Year	

Project Description Telegraph Rd Merge onto SB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1000	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2148	V_D = veh/h
	Ramp Volume, V_R: 408	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2148	0.98	Level	2	0	0.990	1.00	2214
Ramp	408	0.98	Level	2	0	0.990	1.00	420
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2214 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2634	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2634	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 19.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.305 (Exibit 13-11)

S_R = 51.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	PM Existing	Analysis Year	

Project Description: Telegraph Rd Merge onto SB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1000	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1038	V_D = veh/h
	Ramp Volume, V_R: 169	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1038	0.98	Level	2	0	0.990	1.00	1070
Ramp	169	0.98	Level	2	0	0.990	1.00	174
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1070 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1244	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1244	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 8.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.265 (Exibit 13-11)

S_R = 51.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	AM Existing	Analysis Year	

Project Description Telegraph Rd Merge onto NB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 850	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1255	V_D = veh/h
	Ramp Volume, V_R: 206	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1255	0.98	Level	2	0	0.990	1.00	1293
Ramp	206	0.98	Level	2	0	0.990	1.00	212
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1293 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1505	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1505	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 11.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.279 (Exibit 13-11)

S_R = 51.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	PM Existing	Analysis Year	

Project Description Telegraph Rd Merge onto NB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 850	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1470	V_D = veh/h
	Ramp Volume, V_R: 206	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1470	0.98	Level	2	0	0.990	1.00	1515
Ramp	206	0.98	Level	2	0	0.990	1.00	212
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1515 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1727	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1727	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 13.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.283 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Northbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	AM Existing	Analysis Year	

Project Description NB Fairfax County Parkway Diverge to Telegraph Rd

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 640	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1406	V_D = veh/h
	Ramp Volume, V_R: 151	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1406	0.98	Level	2	0	0.990	1.00	1449
Ramp	151	0.98	Level	2	0	0.990	1.00	156
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1449 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1449	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	1293	Exhibit 13-8	4500	No
V_R	156	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1449	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 11.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.442 (Exhibit 13-12)

S_R= 49.3 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 49.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Northbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	PM Existing	Analysis Year	

Project Description NB Fairfax County Parkway Diverge to Telegraph Rd

Site Information

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	640	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	2003	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	533	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2003	0.98	Level	2	0	0.990	1.00	2064
Ramp	533	0.98	Level	2	0	0.990	1.00	549
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2064 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2064	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	1515	Exhibit 13-8	4500	No
V_R	549	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2064	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 16.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.477 (Exhibit 13-12)

S_R= 48.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 48.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Site 28
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - No Build	Analysis Year	
Project Description	SB Fairfaxy Co Pkwy Diverge at Franconia Springfield Pkwy		

Inputs

Upstream Adj Ramp		Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	6300	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	2325	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6300	0.98	Level	2	0	0.990	1.00	6493
Ramp	2325	0.98	Level	2	0	0.990	1.00	2396
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 4240 pc/h

V_3 or V_{av34} 2253 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6493	Exhibit 13-8	6750	No
$V_{FO} = V_F - V_R$	4097	Exhibit 13-8	6750	No
V_R	2396	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4240	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 39.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.644 (Exhibit 13-12)

S_R = 46.6 mph (Exhibit 13-12)

S_0 = 55.4 mph (Exhibit 13-12)

S = 49.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Site 28
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - No Build	Analysis Year	
Project Description	SB Fairfaxy Co Pkwy Diverge at Franconia Springfield Pkwy		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2250	V_D = veh/h
	Ramp Volume, V_R: 700	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2250	0.98	Level	2	0	0.990	1.00	2319
Ramp	700	0.98	Level	2	0	0.990	1.00	721
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 1440 pc/h

V_3 or V_{av34} 879 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2319	Exhibit 13-8	6750	No
$V_{FO} = V_F - V_R$	1598	Exhibit 13-8	6750	No
V_R	721	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1440	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 15.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.493 (Exhibit 13-12)

S_R = 48.6 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 52.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gusrtavo Cuentas	Freeway/Dir of Travel	WB Franconia Springfield Pkwy
Agency or Company	Dewberry	Junction	Site 29
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - No Build	Analysis Year	

Project Description NB Fffx Co Pkwy Merge to WB Franconia Springfield Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 850	V_D = veh/h
	Ramp Volume, V_R: 950	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	850	0.98	Level	2	0	0.990	1.00	876
Ramp	950	0.98	Level	2	0	0.990	1.00	979
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 876 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1855	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1855	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = -8.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.031 (Exibit 13-11)

S_R = 54.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 54.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gusrtavo Cuentas	Freeway/Dir of Travel	WB Franconia Springfield Pkwy
Agency or Company	Dewberry	Junction	Site 29
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - No Build	Analysis Year	

Project Description NB Fffx Co Pkwy Merge to WB Franconia Springfield Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 3375	V_D = veh/h
	Ramp Volume, V_R: 2100	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3375	0.98	Level	2	0	0.990	1.00	3478
Ramp	2100	0.98	Level	2	0	0.990	1.00	2164
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3478 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5642	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5642	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 20.3 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 1.106 (Exibit 13-11)

S_R = 40.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 40.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 37
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - No Build	Analysis Year	

Project Description SB Barta Rd Merge to SB Fairfax Co Pkwy - Site 37

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	1475
Ramp Volume, V_R	75
Freeway Free-Flow Speed, S_{FF}	55.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1475	0.98	Level	2	0	0.990	1.00	1520
Ramp	75	0.98	Level	2	0	0.990	1.00	77
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 1520 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1597	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1597	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 2.2 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.165 (Exibit 13-11)
S_R = 52.9 mph (Exhibit 13-11)
S_0 = N/A mph (Exhibit 13-11)
S = 52.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 37
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - No Build	Analysis Year	

Project Description SB Barta Rd Merge to SB Fairfax Co Pkwy - Site 37

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 375	V_D = veh/h
	Ramp Volume, V_R: 300	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	375	0.98	Level	2	0	0.990	1.00	386
Ramp	300	0.98	Level	2	0	0.990	1.00	309
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 386 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	695	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	695	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = -4.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.154 (Exibit 13-11)

S_R = 53.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 38a
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - No Build	Analysis Year	

Project Description SB Fairfax Co Pkwy Diverge to Barta Rd - Site 38a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2550	V_D = veh/h
	Ramp Volume, V_R: 1075	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2550	0.98	Level	2	0	0.990	1.00	2628
Ramp	1075	0.98	Level	2	0	0.990	1.00	1108
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 1503 pc/h

V_3 or V_{av34} 562 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2628	Exhibit 13-8	9000	No
$V_{FO} = V_F - V_R$	1520	Exhibit 13-8	9000	No
V_R	1108	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1503	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 14.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.528 (Exhibit 13-12)

S_R = 48.1 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 52.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 38a
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - No Build	Analysis Year	

Project Description SB Fairfax Co Pkwy Diverge to Barta Rd - Site 38a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1000	V_D = veh/h
	Ramp Volume, V_R: 550	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1000	0.98	Level	2	0	0.990	1.00	1031
Ramp	550	0.98	Level	2	0	0.990	1.00	567
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 688 pc/h

V_3 or V_{av34} 171 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1031	Exhibit 13-8	9000	No
$V_{FO} = V_F - V_R$	464	Exhibit 13-8	9000	No
V_R	567	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	688	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 7.0 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.479 (Exhibit 13-12)

S_R = 48.8 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 52.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Fairfax County Pkwy & Barta Rd
Date Performed	1/8/2014	Jurisdiction	Site 39a
Analysis Time Period	2017 AM - No Build	Analysis Year	

Project Description: Merge from SB Barta Rd to NB Fairfax Country Pkwy - Site 39a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 750	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1175	V_D = veh/h
	Ramp Volume, V_R: 75	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1175	0.98	Level	2	0	0.990	1.00	1211
Ramp	75	0.98	Level	2	0	0.990	1.00	77
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 725 pc/h

V_3 or V_{av34} = 486 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1288	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	802	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 7.0 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.277 (Exibit 13-11)

S_R = 51.4 mph (Exhibit 13-11)

S_0 = 55.0 mph (Exhibit 13-11)

S = 52.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Fairfax County Pkwy & Barta Rd
Date Performed	1/8/2014	Jurisdiction	Site 39a
Analysis Time Period	2017 PM - No Build	Analysis Year	

Project Description: Merge from SB Barta Rd to NB Fairfax Country Pkwy - Site 39a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 750	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1925	V_D = veh/h
	Ramp Volume, V_R: 500	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1925	0.98	Level	2	0	0.990	1.00	1984
Ramp	500	0.98	Level	2	0	0.990	1.00	515
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1187 pc/h

V_3 or V_{av34} = 797 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2499	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1702	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 13.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.290 (Exibit 13-11)

S_R = 51.2 mph (Exhibit 13-11)

S_0 = 53.9 mph (Exhibit 13-11)

S = 52.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Gustavo Cuentas*
Agency or Company	*Dewberry*
Date Performed	*1/9/2014*
Analysis Time Period	*2017 AM - No Build*

Site Information

Highway/Direction of Travel	*NB Fairfax County Pkwy*
From/To	
Jurisdiction	*Site 40*
Analysis Year	

Project Description *NB Fairfax County Pkwy at Loop Ramp from Barta Rd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1175*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*55.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*55.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*404*	pc/h/ln
S	*55.0*	mph
D = v_p / S	*7.3*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Gustavo Cuentas*
Agency or Company	*Dewberry*
Date Performed	*1/9/2014*
Analysis Time Period	*2017 PM - No Build*

Site Information

Highway/Direction of Travel	*NB Fairfax County Pkwy*
From/To	
Jurisdiction	*Site 40*
Analysis Year	

Project Description *NB Fairfax County Pkwy at Loop Ramp from Barta Rd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2075*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*55.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*55.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*713*	pc/h/ln
S	*55.0*	mph
D = v_p / S	*13.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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Weave between Rolling Rd and Boudinot Dr Site 41

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - No Build

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 41
Analysis Year	

Project Description *Weave between Rolling Rd and Boudinot Dr Site 41*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	1600ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1175	0.98	2	0	1.5	1.2	0.990	1.00	1211
V_{RF}	500	0.98	2	0	1.5	1.2	0.990	1.00	515
V_{FR}	350	0.98	2	0	1.5	1.2	0.990	1.00	361
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1211							V =	2087
V_W	876								
VR	0.420								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	876 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1187 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	346 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1533 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	97

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2087 pc/h	Weaving intensity factor, W	0.218
Weaving segment capacity, c_w	5661 veh/h	Weaving segment speed, S	42.2 mph
Weaving segment v/c ratio	0.365	Average weaving speed, S_W	43.7 mph
Weaving segment density, D	12.4 pc/mi/ln	Average non-weaving speed, S_{NW}	41.2 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	6903 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Rolling Rd and Boudinot Dr Site 41

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - No Build

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 41
Analysis Year	

Project Description *Weave between Rolling Rd and Boudinot Dr Site 41*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	1600ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	600	0.98	2	0	1.5	1.2	0.990	1.00	618
V_{RF}	200	0.98	2	0	1.5	1.2	0.990	1.00	206
V_{FR}	75	0.98	2	0	1.5	1.2	0.990	1.00	77
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	618							V =	901
V_W	283								
VR	0.314								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	283 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	594 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	224 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	818 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	49

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	901 pc/h	Weaving intensity factor, W	0.133
Weaving segment capacity, c_w	7565 veh/h	Weaving segment speed, S	46.6 mph
Weaving segment v/c ratio	0.118	Average weaving speed, S_W	45.9 mph
Weaving segment density, D	4.8 pc/mi/ln	Average non-weaving speed, S_{NW}	46.9 mph
Level of Service, LOS	A	Maximum weaving length, L_{MAX}	5736 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB I-95 Hot Lanes
Agency or Company	Dewberry	Junction	Site 43
Date Performed	1/17/2014	Jurisdiction	
Analysis Time Period	2017 PM - No Build	Analysis Year	

Project Description: New Ramp Merge to SB I-95 Hot Lanes - Site 43

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 875	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 4675	V_D = veh/h
	Ramp Volume, V_R: 200	
	Freeway Free-Flow Speed, S_{FF}: 60.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4675	0.98	Level	2	0	0.990	1.00	4818
Ramp	200	0.98	Level	2	0	0.990	1.00	206
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.602 using Equation (Exhibit 13-6)

V_{12} = 2900 pc/h

V_3 or V_{av34} = 1918 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5024	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3106	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 24.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.347 (Exibit 13-11)

S_R = 53.8 mph (Exhibit 13-11)

S_0 = 54.9 mph (Exhibit 13-11)

S = 54.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - No Build

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 44
Analysis Year	

Project Description *NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	475ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	675	0.98	2	0	1.5	1.2	0.990	1.00	696
V_{RF}	325	0.98	2	0	1.5	1.2	0.990	1.00	335
V_{FR}	750	0.98	2	0	1.5	1.2	0.990	1.00	773
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	696							V =	1804
V_W	1108								
VR	0.614								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1108 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1222 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1222 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	17

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1804 pc/h	Weaving intensity factor, W	0.476
Weaving segment capacity, c_w	3869 veh/h	Weaving segment speed, S	39.1 mph
Weaving segment v/c ratio	0.462	Average weaving speed, S_W	38.7 mph
Weaving segment density, D	11.5 pc/mi/ln	Average non-weaving speed, S_{NW}	39.9 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	9191 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - No Build

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 44
Analysis Year	

Project Description *NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	475ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1225	0.98	2	0	1.5	1.2	0.990	1.00	1263
V_{RF}	200	0.98	2	0	1.5	1.2	0.990	1.00	206
V_{FR}	625	0.98	2	0	1.5	1.2	0.990	1.00	644
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1263							V =	2113
V_W	850								
VR	0.402								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	850 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	964 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	964 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	30

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2113 pc/h	Weaving intensity factor, W	0.395
Weaving segment capacity, c_w	5907 veh/h	Weaving segment speed, S	40.8 mph
Weaving segment v/c ratio	0.354	Average weaving speed, S_W	40.1 mph
Weaving segment density, D	12.9 pc/mi/ln	Average non-weaving speed, S_{NW}	41.3 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	6707 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - No Build

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	825ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1200	0.98	2	0	1.5	1.2	0.990	1.00	1237
V_{RF}	750	0.98	2	0	1.5	1.2	0.990	1.00	773
V_{FR}	925	0.98	2	0	1.5	1.2	0.990	1.00	953
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1237							V =	2963
V_W	1726								
VR	0.583								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1726 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1837 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	124 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1961 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	51

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2963 pc/h	Weaving intensity factor, W	0.447
Weaving segment capacity, c_w	4079 veh/h	Weaving segment speed, S	36.3 mph
Weaving segment v/c ratio	0.719	Average weaving speed, S_W	39.2 mph
Weaving segment density, D	27.2 pc/mi/ln	Average non-weaving speed, S_{NW}	32.8 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	8807 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - No Build

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	825ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1075	0.98	2	0	1.5	1.2	0.990	1.00	1108
V_{RF}	500	0.98	2	0	1.5	1.2	0.990	1.00	515
V_{FR}	725	0.98	2	0	1.5	1.2	0.990	1.00	747
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1108							V =	2370
V_W	1262								
VR	0.532								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1262 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1373 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	98 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1471 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	46

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2370 pc/h	Weaving intensity factor, W	0.357
Weaving segment capacity, c_w	4463 veh/h	Weaving segment speed, S	39.0 mph
Weaving segment v/c ratio	0.526	Average weaving speed, S_W	40.8 mph
Weaving segment density, D	20.3 pc/mi/ln	Average non-weaving speed, S_{NW}	37.1 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	8209 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between NB Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - No Build

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between NB Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	425ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	575	0.98	2	0	1.5	1.2	0.990	1.00	593
V_{RF}	575	0.98	2	0	1.5	1.2	0.990	1.00	593
V_{FR}	950	0.98	2	0	1.5	1.2	0.990	1.00	979
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	593							V =	2165
V_W	1572								
VR	0.726								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1572 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1626 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1626 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	13

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2165 pc/h	Weaving intensity factor, W	0.651
Weaving segment capacity, c_w	3273 veh/h	Weaving segment speed, S	35.9 mph
Weaving segment v/c ratio	0.655	Average weaving speed, S_W	36.2 mph
Weaving segment density, D	20.1 pc/mi/ln	Average non-weaving speed, S_{NW}	35.2 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	10587 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between NB Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - No Build

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between NB Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	425ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	850	0.98	2	0	1.5	1.2	0.990	1.00	876
V_{RF}	275	0.98	2	0	1.5	1.2	0.990	1.00	283
V_{FR}	700	0.98	2	0	1.5	1.2	0.990	1.00	721
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	876							V =	1880
V_W	1004								
VR	0.534								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1004 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1058 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1058 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	19

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1880 pc/h	Weaving intensity factor, W	0.464
Weaving segment capacity, c_w	4450 veh/h	Weaving segment speed, S	39.3 mph
Weaving segment v/c ratio	0.418	Average weaving speed, S_W	38.9 mph
Weaving segment density, D	15.9 pc/mi/ln	Average non-weaving speed, S_{NW}	39.8 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	8227 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Southbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM No Build	Analysis Year	
Project Description	SB Fairfax County Parkway Diverge to Telegraph Rd		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 900	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2370	V_D = veh/h
	Ramp Volume, V_R: 400	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2370	0.98	Level	2	0	0.990	1.00	2443
Ramp	400	0.98	Level	2	0	0.990	1.00	412
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2443 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2443	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	2031	Exhibit 13-8	4500	No
V_R	412	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2443	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.465 (Exhibit 13-12)

S_R= 49.0 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 49.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Southbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM No Build	Analysis Year	

Project Description SB Fairfax County Parkway Diverge to Telegraph Rd

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 900	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1495	V_D = veh/h
	Ramp Volume, V_R: 675	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1495	0.98	Level	2	0	0.990	1.00	1541
Ramp	675	0.98	Level	2	0	0.990	1.00	696
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1541 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1541	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	845	Exhibit 13-8	4500	No
V_R	696	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1541	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 9.4 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.491 (Exhibit 13-12)

S_R= 48.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 48.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM No Build	Analysis Year	

Project Description Telegraph Rd Merge onto SB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1000	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1970	V_D = veh/h
	Ramp Volume, V_R: 320	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1970	0.98	Level	2	0	0.990	1.00	2030
Ramp	320	0.98	Level	2	0	0.990	1.00	330
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2030 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2360	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2360	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.292 (Exibit 13-11)

S_R = 51.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM No Build	Analysis Year	

Project Description Telegraph Rd Merge onto SB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1000	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 835	V_D = veh/h
	Ramp Volume, V_R: 40	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	835	0.98	Level	2	0	0.990	1.00	861
Ramp	40	0.98	Level	2	0	0.990	1.00	41
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 861 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	902	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	902	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 6.2 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.261 (Exibit 13-11)

S_R = 51.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM No Build	Analysis Year	

Project Description Telegraph Rd Merge onto NB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 850	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 845	V_D = veh/h
	Ramp Volume, V_R: 725	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	845	0.98	Level	2	0	0.990	1.00	871
Ramp	725	0.98	Level	2	0	0.990	1.00	747
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 871 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1618	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1618	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.281 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM No Build	Analysis Year	

Project Description Telegraph Rd Merge onto NB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 850	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1265	V_D = veh/h
	Ramp Volume, V_R: 325	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1265	0.98	Level	2	0	0.990	1.00	1304
Ramp	325	0.98	Level	2	0	0.990	1.00	335
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1304 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1639	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1639	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.282 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Northbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM No Build	Analysis Year	
Project Description	NB Fairfax County Parkway Diverge to Telegraph Rd		

Site Information

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 640	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 875	V_D = veh/h
	Ramp Volume, V_R: 30	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	875	0.98	Level	2	0	0.990	1.00	902
Ramp	30	0.98	Level	2	0	0.990	1.00	31
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 902 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	902	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	871	Exhibit 13-8	4500	No
V_R	31	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	902	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 6.2 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.431 (Exhibit 13-12)

S_R= 49.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 49.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Northbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM No Build	Analysis Year	

Project Description NB Fairfax County Parkway Diverge to Telegraph Rd

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	640	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	1745	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	480	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1745	0.98	Level	2	0	0.990	1.00	1798
Ramp	480	0.98	Level	2	0	0.990	1.00	495
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1798 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1798	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	1303	Exhibit 13-8	4500	No
V_R	495	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1798	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 14.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.473 (Exhibit 13-12)

S_R= 48.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 48.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Site 28
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - Alt 1	Analysis Year	
Project Description	SB Fairfaxy Co Pkwy Diverge at Franconia Springfield Pkwy		

Inputs

Upstream Adj Ramp		Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	6350	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	2400	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6350	0.98	Level	2	0	0.990	1.00	6544
Ramp	2400	0.98	Level	2	0	0.990	1.00	2473
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 4305 pc/h

V_3 or V_{av34} 2239 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6544	Exhibit 13-8	6750	No
$V_{FO} = V_F - V_R$	4071	Exhibit 13-8	6750	No
V_R	2473	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4305	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 39.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.651 (Exhibit 13-12)

S_R = 46.5 mph (Exhibit 13-12)

S_0 = 55.5 mph (Exhibit 13-12)

S = 49.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Site 28
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - Alt 1	Analysis Year	
Project Description	SB Fairfaxy Co Pkwy Diverge at Franconia Springfield Pkwy		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2250	V_D = veh/h
	Ramp Volume, V_R: 700	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2250	0.98	Level	2	0	0.990	1.00	2319
Ramp	700	0.98	Level	2	0	0.990	1.00	721
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 1440 pc/h

V_3 or V_{av34} 879 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2319	Exhibit 13-8	6750	No
$V_{FO} = V_F - V_R$	1598	Exhibit 13-8	6750	No
V_R	721	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1440	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 15.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.493 (Exhibit 13-12)

S_R = 48.6 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 52.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gusrtavo Cuentas	Freeway/Dir of Travel	WB Franconia Springfield Pkwy
Agency or Company	Dewberry	Junction	Site 29
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - Alt 1	Analysis Year	
Project Description	NB Fffx Co Pkwy Merge to WB Franconia Springfield Pkwy		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 875	V_D = veh/h
	Ramp Volume, V_R: 950	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	875	0.98	Level	2	0	0.990	1.00	902
Ramp	950	0.98	Level	2	0	0.990	1.00	979
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 902 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1881	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1881	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = -8.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.032 (Exibit 13-11)

S_R = 54.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 54.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gusrtavo Cuentas	Freeway/Dir of Travel	WB Franconia Springfield Pkwy
Agency or Company	Dewberry	Junction	Site 29
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - Alt 1	Analysis Year	

Project Description NB Fffx Co Pkwy Merge to WB Franconia Springfield Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 3375	V_D = veh/h
	Ramp Volume, V_R: 2150	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3375	0.98	Level	2	0	0.990	1.00	3478
Ramp	2150	0.98	Level	2	0	0.990	1.00	2216
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3478 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5694	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5694	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 20.7 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 1.165 (Exibit 13-11)

S_R = 39.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 39.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 37
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - Alt 1	Analysis Year	

Project Description SB Barta Rd Merge to SB Fairfax Co Pkwy - Site 37

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1525	V_D = veh/h
	Ramp Volume, V_R: 75	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1525	0.98	Level	2	0	0.990	1.00	1572
Ramp	75	0.98	Level	2	0	0.990	1.00	77
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1572 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1649	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1649	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 2.6 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.166 (Exibit 13-11)

S_R = 52.8 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 52.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 37
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - Alt 1	Analysis Year	

Project Description SB Barta Rd Merge to SB Fairfax Co Pkwy - Site 37

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 500	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 375	V_D = veh/h
	Ramp Volume, V_R: 300	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	375	0.98	Level	2	0	0.990	1.00	386
Ramp	300	0.98	Level	2	0	0.990	1.00	309
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 386 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	695	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	695	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = -4.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.154 (Exibit 13-11)

S_R = 53.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 38a
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 AM - Alt 1	Analysis Year	

Project Description SB Fairfax Co Pkwy Diverge to Barta Rd - Site 38a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 4	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2600	V_D = veh/h
	Ramp Volume, V_R: 1075	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2600	0.98	Level	2	0	0.990	1.00	2680
Ramp	1075	0.98	Level	2	0	0.990	1.00	1108
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 1517 pc/h

V_3 or V_{av34} 581 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2680	Exhibit 13-8	9000	No
$V_{FO} = V_F - V_R$	1572	Exhibit 13-8	9000	No
V_R	1108	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1517	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 14.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.528 (Exhibit 13-12)

S_R = 48.1 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 52.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Site 38a
Date Performed	1/9/2014	Jurisdiction	
Analysis Time Period	2017 PM - Alt 1	Analysis Year	

Project Description SB Fairfax Co Pkwy Diverge to Barta Rd - Site 38a

Inputs

Upstream Adj Ramp		Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	1000	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	575	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1000	0.98	Level	2	0	0.990	1.00	1031
Ramp	575	0.98	Level	2	0	0.990	1.00	593
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 using Equation (Exhibit 13-7)

V_{12} = 707 pc/h

V_3 or V_{av34} 162 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1031	Exhibit 13-8	9000	No
$V_{FO} = V_F - V_R$	438	Exhibit 13-8	9000	No
V_R	593	Exhibit 13-10	4000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	707	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 7.2 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.481 (Exhibit 13-12)

S_R = 48.7 mph (Exhibit 13-12)

S_0 = 60.3 mph (Exhibit 13-12)

S = 51.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Fairfax County Pkwy & Barta Rd
Date Performed	1/8/2014	Jurisdiction	Site 39a
Analysis Time Period	2017 AM - Alt 1	Analysis Year	

Project Description: Merge from SB Barta Rd to NB Fairfax Country Pkwy - Site 39a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 750	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1175	V_D = veh/h
	Ramp Volume, V_R: 75	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1175	0.98	Level	2	0	0.990	1.00	1211
Ramp	75	0.98	Level	2	0	0.990	1.00	77
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 725 pc/h

V_3 or V_{av34} = 486 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1288	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	802	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 7.0 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.277 (Exibit 13-11)

S_R = 51.4 mph (Exhibit 13-11)

S_0 = 55.0 mph (Exhibit 13-11)

S = 52.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Pkwy
Agency or Company	Dewberry	Junction	Fairfax County Pkwy & Barta Rd
Date Performed	1/8/2014	Jurisdiction	Site 39a
Analysis Time Period	2017 PM - Alt 1	Analysis Year	

Project Description: Merge from SB Barta Rd to NB Fairfax Country Pkwy - Site 39a

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 750	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1950	V_D = veh/h
	Ramp Volume, V_R: 500	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1950	0.98	Level	2	0	0.990	1.00	2010
Ramp	500	0.98	Level	2	0	0.990	1.00	515
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1203 pc/h

V_3 or V_{av34} = 807 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2525	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1718	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.290 (Exibit 13-11)

S_R = 51.2 mph (Exhibit 13-11)

S_0 = 53.9 mph (Exhibit 13-11)

S = 52.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Gustavo Cuentas*
Agency or Company	*Dewberry*
Date Performed	*1/9/2014*
Analysis Time Period	*2017 AM - Alt 1*

Site Information

Highway/Direction of Travel	*NB Fairfax County Pkwy*
From/To	
Jurisdiction	*Site 40*
Analysis Year	

Project Description *NB Fairfax County Pkwy at Loop Ramp from Barta Rd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1175*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*55.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*55.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*404*	pc/h/ln
S	*55.0*	mph
D = v_p / S	*7.3*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*Gustavo Cuentas*
Agency or Company	*Dewberry*
Date Performed	*1/9/2014*
Analysis Time Period	*2017 PM - Alt 1*

Site Information

Highway/Direction of Travel	*NB Fairfax County Pkwy*
From/To	
Jurisdiction	*Site 40*
Analysis Year	

Project Description *NB Fairfax County Pkwy at Loop Ramp from Barta Rd*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2100*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*55.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*55.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*721*	pc/h/ln
S	*55.0*	mph
D = v_p / S	*13.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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Weave between Rolling Rd and Boudinot Dr Site 41

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - Alt 1

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 41
Analysis Year	

Project Description *Weave between Rolling Rd and Boudinot Dr Site 41*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	1600ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1200	0.98	2	0	1.5	1.2	0.990	1.00	1237
V_{RF}	475	0.98	2	0	1.5	1.2	0.990	1.00	490
V_{FR}	400	0.98	2	0	1.5	1.2	0.990	1.00	412
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1237							V =	2139
V_W	902								
VR	0.422								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	902 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1213 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	352 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1565 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	99

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2139 pc/h	Weaving intensity factor, W	0.222
Weaving segment capacity, c_w	5635 veh/h	Weaving segment speed, S	42.0 mph
Weaving segment v/c ratio	0.376	Average weaving speed, S_W	43.6 mph
Weaving segment density, D	12.7 pc/mi/ln	Average non-weaving speed, S_{NW}	40.9 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	6926 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Rolling Rd and Boudinot Dr Site 41

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - Alt 1

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 41
Analysis Year	

Project Description *Weave between Rolling Rd and Boudinot Dr Site 41*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	1600ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	600	0.98	2	0	1.5	1.2	0.990	1.00	618
V_{RF}	200	0.98	2	0	1.5	1.2	0.990	1.00	206
V_{FR}	75	0.98	2	0	1.5	1.2	0.990	1.00	77
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	618							V =	901
V_W	283								
VR	0.314								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	283 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	594 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	224 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	818 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	49

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	901 pc/h	Weaving intensity factor, W	0.133
Weaving segment capacity, c_w	7565 veh/h	Weaving segment speed, S	46.6 mph
Weaving segment v/c ratio	0.118	Average weaving speed, S_W	45.9 mph
Weaving segment density, D	4.8 pc/mi/ln	Average non-weaving speed, S_{NW}	46.9 mph
Level of Service, LOS	A	Maximum weaving length, L_{MAX}	5736 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB I-95 Hot Lanes
Agency or Company	Dewberry	Junction	Site 43
Date Performed	1/17/2014	Jurisdiction	
Analysis Time Period	2017 PM - Alt 1	Analysis Year	

Project Description: New Ramp Merge to SB I-95 Hot Lanes - Site 43

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 875	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 4725	V_D = veh/h
	Ramp Volume, V_R: 200	
	Freeway Free-Flow Speed, S_{FF}: 60.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4725	0.98	Level	2	0	0.990	1.00	4870
Ramp	200	0.98	Level	2	0	0.990	1.00	206
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.602 using Equation (Exhibit 13-6)

V_{12} = 2932 pc/h

V_3 or V_{av34} = 1938 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5076	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3138	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 24.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.350 (Exibit 13-11)

S_R = 53.7 mph (Exhibit 13-11)

S_0 = 54.8 mph (Exhibit 13-11)

S = 54.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - Alt 1

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 44
Analysis Year	

Project Description *NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	475ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	650	0.98	2	0	1.5	1.2	0.990	1.00	670
V_{RF}	325	0.98	2	0	1.5	1.2	0.990	1.00	335
V_{FR}	775	0.98	2	0	1.5	1.2	0.990	1.00	799
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	670							V =	1804
V_W	1134								
VR	0.629								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1134 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1248 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1248 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	16

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1804 pc/h	Weaving intensity factor, W	0.484
Weaving segment capacity, c_w	3780 veh/h	Weaving segment speed, S	39.0 mph
Weaving segment v/c ratio	0.473	Average weaving speed, S_W	38.6 mph
Weaving segment density, D	11.6 pc/mi/ln	Average non-weaving speed, S_{NW}	39.7 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	9368 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - Alt 1

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 44
Analysis Year	

Project Description *NB Farifax Co Pkwy Weave btwn I-95 and Boudinot Dr - Site 44*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	4	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	475ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1275	0.98	2	0	1.5	1.2	0.990	1.00	1314
V_{RF}	175	0.98	2	0	1.5	1.2	0.990	1.00	180
V_{FR}	600	0.98	2	0	1.5	1.2	0.990	1.00	618
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1314							V =	2112
V_W	798								
VR	0.378								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	798 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	912 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	912 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	31

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2112 pc/h	Weaving intensity factor, W	0.378
Weaving segment capacity, c_w	6289 veh/h	Weaving segment speed, S	41.2 mph
Weaving segment v/c ratio	0.332	Average weaving speed, S_W	40.4 mph
Weaving segment density, D	12.8 pc/mi/ln	Average non-weaving speed, S_{NW}	41.7 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	6434 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - Alt 1

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	825ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1275	0.98	2	0	1.5	1.2	0.990	1.00	1314
V_{RF}	750	0.98	2	0	1.5	1.2	0.990	1.00	773
V_{FR}	925	0.98	2	0	1.5	1.2	0.990	1.00	953
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1314							V =	3040
V_W	1726								
VR	0.568								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1726 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1837 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	140 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1977 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	54

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	3040 pc/h	Weaving intensity factor, W	0.450
Weaving segment capacity, c_w	4185 veh/h	Weaving segment speed, S	36.1 mph
Weaving segment v/c ratio	0.719	Average weaving speed, S_W	39.1 mph
Weaving segment density, D	28.1 pc/mi/ln	Average non-weaving speed, S_{NW}	32.7 mph
Level of Service, LOS	D	Maximum weaving length, L_{MAX}	8629 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - Alt 1

Site Information

Freeway/Dir of Travel	SB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	825ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1075	0.98	2	0	1.5	1.2	0.990	1.00	1108
V_{RF}	500	0.98	2	0	1.5	1.2	0.990	1.00	515
V_{FR}	725	0.98	2	0	1.5	1.2	0.990	1.00	747
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	1108							V =	2370
V_W	1262								
VR	0.532								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1262 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1373 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	98 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1471 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	46

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2370 pc/h	Weaving intensity factor, W	0.357
Weaving segment capacity, c_w	4463 veh/h	Weaving segment speed, S	39.0 mph
Weaving segment v/c ratio	0.526	Average weaving speed, S_W	40.8 mph
Weaving segment density, D	20.3 pc/mi/ln	Average non-weaving speed, S_{NW}	37.1 mph
Level of Service, LOS	C	Maximum weaving length, L_{MAX}	8209 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between NB Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 AM - Alt 1

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between NB Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	425ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	650	0.98	2	0	1.5	1.2	0.990	1.00	670
V_{RF}	450	0.98	2	0	1.5	1.2	0.990	1.00	464
V_{FR}	900	0.98	2	0	1.5	1.2	0.990	1.00	928
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	670							V =	2062
V_W	1392								
VR	0.675								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	1392 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1446 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1446 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	14

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	2062 pc/h	Weaving intensity factor, W	0.594
Weaving segment capacity, c_w	3520 veh/h	Weaving segment speed, S	36.9 mph
Weaving segment v/c ratio	0.580	Average weaving speed, S_W	37.0 mph
Weaving segment density, D	18.6 pc/mi/ln	Average non-weaving speed, S_{NW}	36.7 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	9943 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Weave between NB Fairfax County Pkwy and I-95 - Site 45

FREEWAY WEAVING WORKSHEET

General Information

Analyst	Gustavo Cuentas
Agency/Company	Dewberry
Date Performed	1/8/2014
Analysis Time Period	2017 PM - Alt 1

Site Information

Freeway/Dir of Travel	NB Fairfax County Pkwy
Weaving Segment Location	Site 45
Analysis Year	

Project Description *Weave between NB Fairfax County Pkwy and I-95 - Site 45*

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	3	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	425ft	Freeway maximum capacity, C_{IFL}	2250
Freeway free-flow speed, FFS	50 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	850	0.98	2	0	1.5	1.2	0.990	1.00	876
V_{RF}	275	0.98	2	0	1.5	1.2	0.990	1.00	283
V_{FR}	675	0.98	2	0	1.5	1.2	0.990	1.00	696
V_{RR}	0	0.98	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	876							V =	1855
V_W	979								
VR	0.528								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	979 lc/h
Interchange density, ID	0.5 int/mi	Weaving lane changes, LC_W	1033 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	0 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	1033 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	19

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	1855 pc/h	Weaving intensity factor, W	0.455
Weaving segment capacity, c_w	4502 veh/h	Weaving segment speed, S	39.5 mph
Weaving segment v/c ratio	0.408	Average weaving speed, S_W	39.0 mph
Weaving segment density, D	15.7 pc/mi/ln	Average non-weaving speed, S_{NW}	40.0 mph
Level of Service, LOS	B	Maximum weaving length, L_{MAX}	8153 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Southbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM Alt 1	Analysis Year	
Project Description	SB Fairfax County Parkway Diverge to Telegraph Rd		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 900	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2495	V_D = veh/h
	Ramp Volume, V_R: 450	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2495	0.98	Level	2	0	0.990	1.00	2571
Ramp	450	0.98	Level	2	0	0.990	1.00	464
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2571 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2571	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	2107	Exhibit 13-8	4500	No
V_R	464	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2571	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 18.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.470 (Exhibit 13-12)

S_R= 48.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 48.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Southbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM Alt 1	Analysis Year	
Project Description	SB Fairfax County Parkway Diverge to Telegraph Rd		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 900	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1545	V_D = veh/h
	Ramp Volume, V_R: 675	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1545	0.98	Level	2	0	0.990	1.00	1592
Ramp	675	0.98	Level	2	0	0.990	1.00	696
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1592 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1592	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	896	Exhibit 13-8	4500	No
V_R	696	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1592	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 9.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.491 (Exhibit 13-12)

S_R= 48.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 48.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM Alt 1	Analysis Year	

Project Description Telegraph Rd Merge onto SB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1000	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 2060	V_D = veh/h
	Ramp Volume, V_R: 320	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2060	0.98	Level	2	0	0.990	1.00	2123
Ramp	320	0.98	Level	2	0	0.990	1.00	330
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2123 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2453	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2453	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 18.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.296 (Exibit 13-11)

S_R = 51.1 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	SB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM Alt 1	Analysis Year	

Project Description Telegraph Rd Merge onto SB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 1000	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 890	V_D = veh/h
	Ramp Volume, V_R: 60	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	890	0.98	Level	2	0	0.990	1.00	917
Ramp	60	0.98	Level	2	0	0.990	1.00	62
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 917 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	979	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	979	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 6.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.261 (Exibit 13-11)

S_R = 51.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM Alt 1	Analysis Year	

Project Description Telegraph Rd Merge onto NB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 850	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 870	V_D = veh/h
	Ramp Volume, V_R: 725	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	870	0.98	Level	2	0	0.990	1.00	897
Ramp	725	0.98	Level	2	0	0.990	1.00	747
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 897 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1644	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1644	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.282 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	NB Fairfax County Parkway
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy & Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM Alt 1	Analysis Year	

Project Description Telegraph Rd Merge onto NB Fairfax Co Pkwy

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A: 850	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1300	V_D = veh/h
	Ramp Volume, V_R: 300	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1300	0.98	Level	2	0	0.990	1.00	1340
Ramp	300	0.98	Level	2	0	0.990	1.00	309
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1340 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1649	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1649	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.282 (Exibit 13-11)

S_R = 51.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 51.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Northbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 AM Alt 1	Analysis Year	

Project Description NB Fairfax County Parkway Diverge to Telegraph Rd

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☑ No	☐ Off	Deceleration Lane Length L_D	640	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	910	L_{down} =	ft
V_u =	veh/h	Ramp Volume, V_R	40	V_D =	veh/h
		Freeway Free-Flow Speed, S_{FF}	55.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	910	0.98	Level	2	0	0.990	1.00	938
Ramp	40	0.98	Level	2	0	0.990	1.00	41
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 938 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	938	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	897	Exhibit 13-8	4500	No
V_R	41	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	938	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 6.6 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.432 (Exhibit 13-12)

S_R= 49.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 49.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	Gustavo Cuentas	Freeway/Dir of Travel	Northbound Fairfax Co Pkwy
Agency or Company	Dewberry	Junction	Fairfax Co Pkwy &Telegraph Rd
Date Performed	1/7/2014	Jurisdiction	
Analysis Time Period	2017 PM Alt 1	Analysis Year	

Project Description NB Fairfax County Parkway Diverge to Telegraph Rd

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A:	☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 640	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F: 1880	V_D = veh/h
	Ramp Volume, V_R: 580	
	Freeway Free-Flow Speed, S_{FF}: 55.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1880	0.98	Level	2	0	0.990	1.00	1938
Ramp	580	0.98	Level	2	0	0.990	1.00	598
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1938 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1938	Exhibit 13-8	4500	No
$V_{FO} = V_F - V_R$	1340	Exhibit 13-8	4500	No
V_R	598	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1938	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 15.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.482 (Exhibit 13-12)

S_R = 48.7 mph (Exhibit 13-12)

S_0 = N/A mph (Exhibit 13-12)

S = 48.7 mph (Exhibit 13-13)

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APPENDIX E

AIR QUALITY

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E.1 EMISSIONS ESTIMATIONS AND METHODOLOGY

The U.S. Army has considered all foreseeable direct and indirect sources of air emission associated with the proposed action. *Direct emissions* are emissions that are caused or initiated by a federal action and occur at the same time and place as the action. *Indirect emissions* are reasonably foreseeable emissions that are caused by the action but might occur later in time and/or be farther removed in distance from the action itself, and that the federal agency can practicably control. More specifically, project-related direct emissions would result from the following:

- *Construction activities*: The use of non-road equipment (e.g., bulldozers, backhoes), worker vehicles, the use of volatile organic compound (VOC) paints, paving off-gasses, and fugitive particles from surface disturbances
- *Operational activities*: Commuting by new personnel and equipment are exempt from permitting under 9VAC5-80-1105 (i.e., gaseous fuel burning units w/ max heat input less than 50,000,000 Btu/hr and diesel generators with electrical output of 1,125 kW). Notably, The portion of an action that includes major or minor new or modified stationary sources that require a permit under the new source review (NSR) program (Section 110(a)(2)(c) and Section 173 of the Act) or the prevention of significant deterioration program (title I, part C of the Act) are exempt from the GCR.

E.1.1 Construction Emissions

All direct and indirect emissions associated with Alternative 1 were estimated. The construction emissions were generated by estimating equipment use for construction and roadway improvement projects to support the Army's mission of establishing optimal land use and optimal allocation of resources. A detailed description of the proposed action and a list of the proposed short- and long-term projects is in Section 2 of the EIS.

Demolition and construction emissions associated with the use of construction equipment (e.g., bulldozers, backhoes), worker vehicles, the use of VOC paints, paving off-gasses, and fugitive particles from surface disturbances are presented in Table E-1 for all years of construction under Alternative 1. This section also outlines all the calculations and assumptions made to derive these construction emission estimations.

E.1.1.1 Heavy Construction Equipment

Pollutant emissions resulting from activities associated with constructing the proposed buildings, parking facilities, and roadways were estimated. The typical construction would involve such activities as demolition of existing buildings or structures, utility installation, road construction, site clearing and grading, building construction, and asphalt paving.

Construction would involve the use of various non-road equipment, power generators, and trucks. Pieces of equipment to be used for building construction include, but are not limited to, backhoes, loaders, excavators, air compressors, dozers, cranes, pavers, graders, rollers, and heavy trucks. Information regarding the number of pieces and types of construction equipment to be used on the project, the schedule for deployment of equipment (monthly and annually), and the approximate daily operating time (including power level or usage factor) were estimated for each individual construction project based on a schedule of construction activity.

Emissions from construction activities were estimated based on the projected construction activity schedule, the number of vehicles/pieces of equipment, and vehicle/equipment utilization rates. Emission factors for heavy-duty diesel equipment were obtained from USEPA's *NONROAD2005 Emissions Model* (USEPA

2005a). The equipment and vehicle operation hours were estimated based on R.S.Means' *Building Cost Construction Data*, 64th annual edition (Waier 2006), and field experience from similar projects.

Table E-1. Estimated Construction Emissions - Alternative 1

			Construction Emissions (tpy)			
Year	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Year 1	27.8	45.1	7.9	3.7	5.4	7.5
Year 2	39.4	61.8	9.7	5.0	7.9	9.6
Year 3	29.8	40.5	4.7	3.0	5.1	7.5
Year 4	15.7	20.9	2.8	1.7	2.8	4.2
Year 5	40.5	50.7	5.0	3.9	6.9	10.3
Year 6	44.4	61.2	7.3	5.4	8.7	11.8
Year 1	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	17.7	44.3	4.3	3.1	5.4	4.4
Worker Trip Emissions	10.1	0.8	<0.1	<0.1	<0.1	0.7
Architectural Coating Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	0.9
Paving Off Gas Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	2.3
Fugitive Dust Emissions	<0.1	<0.1	3.6	0.5	<0.1	<0.1
Total	27.8	45.1	7.9	3.7	5.4	6.1
Year 2	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	24.9	60.6	4.3	4.2	7.9	5.6
Worker Trip Emissions	14.4	1.1	<0.1	<0.1	<0.1	1.0
Architectural Coating Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	2.1
Paving Off Gas Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fugitive Dust Emissions	<0.1	<0.1	5.3	0.8	<0.1	<0.1
Total	39.4	61.8	9.7	5.0	7.9	7.8
Year 3	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	16.1	39.4	2.8	2.7	5.1	3.7
Worker Trip Emissions	13.8	1.1	<0.1	<0.1	<0.1	1.0
Architectural Coating Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	2.8
Paving Off Gas Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fugitive Dust Emissions	<0.1	<0.1	1.8	0.3	<0.1	<0.1
Total	29.8	40.5	4.7	3.0	5.1	5.8
Year 4	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	8.5	20.4	1.5	1.4	2.8	1.9
Worker Trip Emissions	7.2	0.6	<0.1	<0.1	<0.1	0.5
Architectural Coating Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	1.8
Paving Off Gas Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fugitive Dust Emissions	<0.1	<0.1	1.3	0.2	<0.1	<0.1
Total	15.7	20.9	2.8	1.7	2.8	3.1
Year 5	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	20.4	49.1	3.8	3.7	6.8	4.6
Worker Trip Emissions	20.1	1.6	0.1	0.1	<0.1	1.4
Architectural Coating Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	4.3
Paving Off Gas Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fugitive Dust Emissions	<0.1	<0.1	1.1	0.2	<0.1	<0.1
Total	40.5	50.7	5.0	3.9	6.9	7.7
Year 6	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	25.0	59.7	5.2	5.0	8.6	5.6
Worker Trip Emissions	19.4	1.5	0.1	0.1	<0.1	1.4
Architectural Coating Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	1.9
Paving Off Gas Emissions	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fugitive Dust Emissions	<0.1	<0.1	2.1	0.3	<0.1	<0.1
Total	44.4	61.2	7.3	5.4	8.7	8.9

Emission factors in grams of pollutant per hour were multiplied by the estimated running time to calculate total grams of pollutant from each piece of equipment. Finally, these total grams of pollutant were converted to tons of pollutant. The following formula was used to calculate hourly emissions from non-road engine sources, including cranes, backhoes, and the like:

$M_i = (N \times EF_i)$

where: M_i = mass of emissions of ith pollutant during inventory period

N = source population (units)

EF_i = average emissions of ith pollutant per unit of use (e.g., grams per hour)

The total annual emissions for Alternative 1 are summarized in Table E-2.

Table E-2. Estimated Annual Emissions from Construction Equipment - Alternative 1

	Annual Emissions (tpy)					
Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Year 1	17.8	44.3	4.3	3.1	5.4	4.4
Year 2	24.9	60.6	4.3	4.2	7.9	5.6
Year 3	16.1	39.4	2.8	2.7	5.1	3.7
Year 4	8.5	20.4	1.5	1.4	2.8	1.9
Year 5	20.4	49.1	3.8	3.7	6.8	4.6
Year 6	25.0	59.7	5.2	5.0	8.6	5.6

Source: USEPA 2005a and SQAQMD 1993

E.1.1.2 Construction Worker Vehicle Operations

Emissions due to construction worker vehicle use were included in the analysis. Emission factors for motor vehicles were conservatively calculated using the USEPA MOVES mobile emissions model. These emission factors were then multiplied by the vehicle operational hours to determine motor vehicle emissions. The analysis assumed conservatively that the worker's vehicle would drive 30 miles per day at an average speed of 35 miles per hour. The total annual emissions for Alternative 1 are summarized in Table E-3.

Table E-3. Estimated Annual Emissions from Construction Worker Vehicles - Alternative 1

			Annual Emissions (tpy)			
Year	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Year 1	10.1	0.8	<0.1	<0.1	<0.1	0.7
Year 2	14.5	1.1	<0.1	<0.1	<0.1	1.0
Year 3	13.8	1.1	<0.1	<0.1	<0.1	1.0
Year 4	7.2	0.6	<0.1	<0.1	<0.1	0.5
Year 5	20.1	1.6	0.1	0.1	0.1	1.4
Year 6	19.4	1.5	0.1	0.1	<0.1	1.4

Source: USEPA 2012 and SQAQMD 1993

E.1.1.3 Emissions from Architectural Coatings

Emission factors relating emissions to total square footage to be built were used to estimate VOC emissions from architectural coating activities – primarily painting activities. For office space, the area to be painted was assumed to be approximately twice the heated area of the facility, and the dry film thickness was assumed to be three millimeters (mm). The following formula was used to calculate emissions from the painting of the facilities:

$E = [(F \times G) / 1000] \times H$

where: E = emissions of VOCs from architectural coatings

F = pounds of VOC emissions per gallon

G = total area to be coated (floor area x 2)

H = paint coverage.

A sample calculation for architectural coating VOC emissions during construction of an example facility is provided below:

Floor area = 100,000 ft^2

E = [(2.09) [lb/gallon] / 400 [ft^2/gallon] x [(100,000 [ft^2] x 2)]]/2,000 [lb/ton]

= 0.208 tons

The total annual emissions for Alternative 1 are summarized in Table E-4. In addition, estimated emissions from the potential construction are presented in Appendix E.2.

Table E-4. Annual VOC Emissions from Architectural Coatings - Alternative 1

Year	Annual VOC Emissions (tpy)
Year 1	2.3
Year 2	3.0
Year 3	2.8
Year 4	1.8
Year 5	4.3
Year 6	4.8

Source: SQAQMD 1993 and 9-VAC-5 Chapter 45 - Part II Article 5

E.1.1.4 Asphalt Curing Emissions

Asphalt paving would generate emissions from (1) asphalt curing, (2) operation of onsite paving equipment, and (3) operation of motor vehicles, including paving material delivery trucks and worker commuting vehicles. Because the emissions resulting from the operation of onsite paving equipment, trucks, and vehicles were included in the previous section, only asphalt curing-related emissions are discussed in this section. Asphalt curing-related VOC emissions were calculated based on the amount of paving for the onsite parking lot and proposed roadways. The following assumption was used in VOC emission calculations for asphalt curing (SQAQMD 1993):

E = area paved x 2.62 lb VOC/acre

A sample calculation is provided below:

Paved area = 100 acres

E = 100 acres x 2.62 lb VOC/acre/2000 lb/ton

= 0.131 ton

Due to the minimal paving for all alternatives, negligible off gas emissions are anticipated.

E.1.1.5 Surface Disturbance

The quantity of dust emissions from construction operations is proportional to the area of land being worked and to the level of construction activity. The following assumptions were used in $PM_{2.5}$ emission calculations for fugitive dust emissions (USEPA 1995 and USEPA 2005b).

E = open area x EF x PM_{10}/TSP x $PM_{2.5}/PM_{10}$ x capture fraction

where: open area = number of acres open

EF = 80 lb TSP/acre

PM_{10}/TSP = 0.45 lb PM_{10}/lb TSP

TSP = total suspended particulates

$PM_{2.5}/PM_{10}$ = 0.15 lb $PM_{2.5}$/lb PM_{10}

Capture fraction = 0.5

A sample calculation is provided below:

Disturbed area = 100 acres

E = 100 ac x 80 lb TSP /acre x 0.45 lb PM_{10}/lb TSP x 0.15 lb $PM_{2.5}$/ lb PM_{10} x 2000 lb/ton

= 1.35 tons

The total annual emissions for Alternative 1 are summarized in Table E-5.

Table E-5. Annual $PM_{2.5}$ Emissions from Surface Disturbance - Alternative 1

Year	Annual emissions (tpy)	
	PM_{10}	$PM_{2.5}$
Year 1	3.6	0.5
Year 2	5.3	0.8
Year 3	1.8	0.3
Year 4	1.3	0.2
Year 5	1.1	0.2
Year 6	2.1	0.3

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E.2 EMISSIONS CALCULATIONS

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Table E-6. Project Areas and Durations

Project Name	Year	Area			Duration (days)		
		Clearing [Acres]	Building [Sqft]	Paving [Acres]	Clearing	Building	Paving
ST 01-New PX - Clearing	1	24.37	0	0	20	0	0
ST 01-New PX - Building	1	0	270,000	0	0	336	0
ST 01-New PX - Paving	1	0	0	16.78	0	0	9
ST 02-PAL - Clearing	1	5.41	0	0	10	0	0
ST 02-PAL - Building	1	0	103,402	0	0	276	0
ST 02-PAL - Paving	1	0	0	2.05	0	0	2
ST 03-National Intrepid Center of Excellence - Clearing	1	2.81	0	0	9	0	0
ST 03-National Intrepid Center of Excellence - Building	1	0	18,078	0	0	123	0
ST 03-National Intrepid Center of Excellence - Paving	1	0	0	0.57	0	0	1
ST 04-Mulligan Road Phase II - Clearing	1	32.06	0	0	23	0	0
ST 04-Mulligan Road Phase II - Paving	1	0	0	20.04	0	0	10
ST 05-Fisher House 1 - Clearing	1	1.8	0	0	8	0	0
ST 05-Fisher House 1 - Building	1	0	10,000	0	0	108	0
ST 05-Fisher House 1 - Paving	1	0	0	0.64	0	0	1
ST 06-USO Family Center - Clearing	1	3.46	0	0	9	0	0
ST 06-USO Family Center - Building	1	0	25,000	0	0	135	0
ST 06-USO Family Center - Paving	1	0	0	0.59	0	0	1
ST 07-DAAF Firehouse Expansion - Clearing	1	0.43	0	0	8	0	0
ST 07-DAAF Firehouse Expansion - Building	1	0	4,050	0	0	97	0
ST 07-DAAF Firehouse Expansion - Paving	1	0	0	0.01	0	0	1
ST 08-CDC 144 - Clearing	1	3.69	0	0	9	0	0
ST 08-CDC 144 - Building	1	0	13,020	0	0	113	0
ST 08-CDC 144 - Paving	1	0	0	1.05	0	0	1
ST 09-Family Travel Camp Phase 1 - Clearing	1	9.66	0	0	12	0	0
ST 09-Family Travel Camp Phase 1 - Building	1	0	1,658	0	0	93	0
ST 09-Family Travel Camp Phase 1 - Paving	1	0	0	1.6	0	0	1
ST 11-CDC 1 - Clearing	2	3.21	0	0	9	0	0
ST 11-CDC 1 - Building	2	0	10,640	0	0	109	0
ST 11-CDC 1 - Paving	2	0	0	2.32	0	0	2
ST 12-CDC 2 - Clearing	2	0.5	0	0	8	0	0
ST 12-CDC 2 - Building	2	0	10,640	0	0	109	0
ST 12-CDC 2 - Paving	2	0	0	0.22	0	0	1
ST 13-Access Road & Control Point - Lieber Gate - Clearing	2	8.02	0	0	11	0	0
ST 13-Access Road & Control Point - Lieber Gate - Building	2	0	1,500	0	0	93	0
ST 13-Access Road & Control Point - Lieber Gate - Paving	2	0	0	6.01	0	0	3
ST 14-Regional Stormwater Management Facility - Clearing	2	3.51	0	0	9	0	0
ST 14-Regional Stormwater Management Facility - Paving	2	0	0	0.23	0	0	1

Project Name	Year	Area			Duration (days)		
		Clearing [Acres]	Building [Sqft]	Paving [Acres]	Clearing	Building	Paving
ST 15-AAFES Car Wash - Clearing	2	0.13	0	0	8	0	0
ST 15-AAFES Car Wash - Building	2	0	1,350	0	0	92	0
ST 15-AAFES Car Wash - Paving	2	0	0	0.1	0	0	1
ST 16-PX - Demolition	2	3.2	0	0	30	0	0
ST 17-Reconfigure Golf Course - Clearing	2	33.86	0	0	60	0	0
ST 17-Reconfigure Golf Course - Paving	2	0	0	1.3	0	0	30
ST 18-NMUSA -Roads and Infrastructure - Clearing	2	16.55	0	0	60	0	0
ST 18-NMUSA -Roads and Infrastructure - Paving	2	0	0	8.28	0	0	90
ST 19-INSCOM Phase 1 - Clearing	2	5.49	0	0	10	0	0
ST 19-INSCOM Phase 1 - Building	2	0	420,000	0	0	354	0
ST 19-INSCOM Phase 1 - Paving	2	0	0	1.08	0	0	1
ST 20-South Post Fire Station - Clearing	2	1.46	0	0	8	0	0
ST 20-South Post Fire Station - Building	2	0	10,297	0	0	109	0
ST 20-South Post Fire Station - Paving	2	0	0	0.07	0	0	1
ST 21-AAFES Car Care Center - Clearing	2	0.16	0	0	8	0	0
ST 21-AAFES Car Care Center - Building	2	0	9,000	0	0	106	0
ST 21-AAFES Car Care Center Station - Paving	2	0	0	0.01	0	0	1
ST 22-Pet Care Center - Clearing	2	1	0	0	8	0	0
ST 22-Pet Care Center - Building	2	0	5,200	0	0	99	0
ST 22-Pet Care Center Station - Paving	2	0	0	0.2	0	0	1
ST 23-NGA Canine Training/ Rest Facility - Clearing	2	0.49	0	0	8	0	0
ST 23-NGA Canine Training/ Rest Facility - Building	2	0	1,200	0	0	92	0
ST 23-NGA Canine Training/ Rest Facility Station - Paving	2	0	0	0.03	0	0	1
ST 24-Fairfax County School Expansion - Clearing	2	6.25	0	0	11	0	0
ST 24-Fairfax County School Expansion - Building	2	0	98,400	0	0	267	0
ST 24-Fairfax County School Expansion - Paving	2	0	0	2.01	0	0	2
ST 25-Casual Dining Restaurant - Clearing	3	0.2	0	0	8	0	0
ST 25-Casual Dining Restaurant - Building	3	0	6,500	0	0	102	0
ST 25-Casual Dining Restaurant - Paving	3	0	0	0.15	0	0	1
ST 26-INSCOM Phase 2 - Clearing	3	5.49	0	0	10	0	0
ST 26-INSCOM Phase 2 - Building	3	0	188,000	0	0	354	0
ST 26-INSCOM Phase 2 - Paving	3	0	0	1.08	0	0	1
ST 27-NMUSA Phase 1 - Clearing	3	16.55	0	0	16	0	0
ST 27-NMUSA Phase 1 - Building	3	0	195,130	0	0	344	0
ST 27-NMUSA Phase 1 - Paving	3	0	0	8.28	0	0	5
ST 28-Main Post Commissary - Clearing	3	19.44	0	0	17	0	0
ST 28-Main Post Commissary - Building	3	0	132,000	0	0	328	0
ST 28-Main Post Commissary - Paving	3	0	0	2.18	0	0	2
ST 29-DLA Visitor Control Center - Clearing	3	0.46	0	0	8	0	0

Project Name	Year	Area			Duration (days)		
		Clearing [Acres]	Building [Sqft]	Paving [Acres]	Clearing	Building	Paving
ST 29-DLA Visitor Control Center - Building	3	0	2,960	0	0	95	0
ST 29-DLA Visitor Control Center - Paving	3	0	0	0.35	0	0	1
ST 30-Fisher House 2 - Clearing	3	1.8	0	0	8	0	0
ST 30-Fisher House 2 - Building	3	0	10,000	0	0	108	0
ST 30-Fisher House 2 - Paving	3	0	0	0.5	0	0	1
ST 31-Family Travel Camp Phase 2 - Clearing	3	1.26	0	0	8	0	0
ST 31-Family Travel Camp Phase 2 - Paving	3	0	0	0.94	0	0	1
ST 32-249th Infantry HQ - Clearing	4	10.52	0	0	13	0	0
ST 32-249th Infantry HQ - Building	4	0	81,783	0	0	237	0
ST 32-249th Infantry HQ - Paving	4	0	0	4.11	0	0	3
ST 33-INSCOM Phase 3 - Clearing	4	5.49	0	0	10	0	0
ST 33-INSCOM Phase 3 - Building	4	0	194,000	0	0	354	0
ST 33-INSCOM Phase 3 - Paving	4	0	0	1.08	0	0	1
ST 34-NMUSA Phase 2 - Clearing	4	16.55	0	0	16	0	0
ST 34-NMUSA Phase 2 - Building	4	0	36,667	0	0	156	0
ST 34-NMUSA Phase 2 - Paving	4	0	0	8.28	0	0	5
ST 35-Retail Fuel Point - Clearing	4	1.04	0	0	8	0	0
ST 35-Retail Fuel Point - Building	4	0	784	0	0	91	0
ST 35-Retail Fuel Point - Paving	4	0	0	0.78	0	0	1
ST 36-29th Infantry HQ - Clearing	5	7.37	0	0	11	0	0
ST 36-29th Infantry HQ - Building	5	0	33,258	0	0	150	0
ST 36-29th Infantry HQ - Paving	5	0	0	0.76	0	0	1
ST 37-Medical Office Building - Clearing	5	0.6	0	0	8	0	0
ST 37-Medical Office Building - Building	5	0	21,948	0	0	130	0
ST 37-Medical Office Building - Paving	5	0	0	0.45	0	0	1
ST 38-NMUSA Phase 3 - Clearing	5	16.55	0	0	16	0	0
ST 38-NMUSA Phase 3 - Building	5	0	36,667	0	0	156	0
ST 38-NMUSA Phase 3 - Paving	5	0	0	8.28	0	0	5
ST 39-Multipurpose Fields - Clearing	5	2.35	0	0	9	0	0
ST 39-Multipurpose Fields - Paving	5	0	0	0.36	0	0	30
ST 40-DLA Parking Garage - Clearing	5	1.2	0	0	8	0	0
ST 40-DLA Parking Garage - Building	5	0	700,000	0	0	356	0
ST 40-DLA Parking Garage - Paving	5	0	0	0.4	0	0	1
ST 41-NMUSA Phase 4 - Clearing	6	16.55	0	0	16	0	0
ST 41-NMUSA Phase 4 - Building	6	0	36,667	0	0	156	0
ST 41-NMUSA Phase 4 - Paving	6	0	0	8.28	0	0	5
ST 42-Unaccompanied Enlisted Personnel Barracks - Clearing	6	0.61	0	0	8	0	0
ST 42-Unaccompanied Enlisted Personnel Barracks - Building	6	0	103,960	0	0	277	0
ST 42-Unaccompanied Enlisted Personnel Barracks - Paving	6	0	0	0.2	0	0	1

Project Name	Year	Area			Duration (days)		
		Clearing [Acres]	Building [Sqft]	Paving [Acres]	Clearing	Building	Paving
ST 43-OSEG Training Compound - Clearing	6	9.02	0	0	12	0	0
ST 43-OSEG Training Compound - Building	6	0	91,531	0	0	255	0
ST 43-OSEG Training Compound - Paving	6	0	0	3.15	0	0	2
ST 44-Baseball Field Replacement - Clearing	6	0.92	0	0	8	0	0
ST 45-Secure Admin Facility - Clearing	6	3.85	0	0	2	0	0
ST 45-Secure Admin Facility - Building	6	0	107,193	0	0	283	0
ST 45-Secure Admin Facility - Paving	6	0	0	0.35	0	0	1
ST 46-INSCOM Phase 4 - Clearing	6	5.49	0	0	10	0	0
ST 46-INSCOM Phase 4 - Building	6	0	105,000	0	0	279	0
ST 46-INSCOM Phase 4 - Paving	6	0	0	1.08	0	0	1
ST 47-Relgious Education Center - Clearing	6	1.12	0	0	8	0	0
ST 47-Relgious Education Center - Building	6	0	18,093	0	0	123	0
ST 47-Relgious Education Center - Paving	6	0	0	0.63	0	0	1
ST 48-INSCOM Warehouse - Clearing	6	6.85	0	0	11	0	0
ST 48-INSCOM Warehouse - Building	6	0	57,116	0	0	193	0
ST 48-INSCOM Warehouse - Paving	6	0	0	0.56	0	0	1
ST 49-911th Engineering Company Operations Complex - Clearing	6	6.85	0	0	11	0	0
ST 49-911th Engineering Company Operations Complex - Building	6	0	39,810	0	0	162	0
ST 49-911th Engineering Company Operations Complex - Paving	6	0	0	0.67	0	0	1
ST 50-Vehicle Maintenance Shop - Clearing	6	0.35	0	0	8	0	0
ST 50-Vehicle Maintenance Shop - Building	6	0	25,565	0	0	136	0
ST 50-Vehicle Maintenance Shop - Paving	6	0	0	0.24	0	0	1
ST 51-Network Enterprise Center Information Systems Facility - Clearing	6	0.85	0	0	8	0	0
ST 51-Network Enterprise Center Information Systems Facility - Building	6	0	75,000	0	0	225	0
ST 51-Network Enterprise Center Information Systems Facility - Paving	6	0	0	0.11	0	0	1
ST 52-DLA HQ Building - Clearing	6	3.86	0	0	9	0	0
ST 52-DLA HQ Building - Building	6	0	267,000	0	0	355	0
ST 52-DLA HQ Building - Paving	6	0	0	1.82	0	0	1

Table E-7. Annual Equipment Use

Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Generator Sets	11,319	14,966	9,317	5,866	13,020	19,593
Air Compressors	11,319	14,966	9,317	5,866	13,020	19,593
Pavers	392	945	84	70	266	112
Plate Compactors	18,056	23,308	18,904	9,576	26,424	32,008
Rollers	1,316	3,192	238	210	602	294
Scrapers	1,519	3,416	756	532	476	889
Cement & Mortar Mixers	31,206	39,844	32,998	16,688	45,976	55,902
Cranes	31,206	39,844	32,998	16,688	45,976	55,902
Graders	1,519	3,416	756	532	476	889
Off-highway Trucks	33,117	44,205	33,838	17,290	46,718	56,903
Tractors/Loaders/Backhoes	32,725	43,260	33,754	17,220	46,452	56,791
Crawler Tractor/Dozers	1,519	3,416	756	532	476	889

Table E-8. Heavy Equipment Emissions

Project	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
ST 01-New PX - Clearing	0.40	1.09	0.40	0.09	0.16	0.12
ST 01-New PX - Building	7.10	17.71	1.25	1.21	2.10	1.71
ST 01-New PX - Paving	0.11	0.22	0.02	0.02	0.03	0.02
ST 02-PAL - Clearing	0.07	0.18	0.07	0.01	0.03	0.02
ST 02-PAL - Building	3.66	9.27	0.65	0.63	1.09	0.90
ST 02-PAL - Paving	0.01	0.02	<0.01	<0.01	<0.01	<0.01
ST 03-National Intrepid Center of Excellence - Clearing	0.06	0.16	0.06	0.01	0.02	0.02
ST 03-National Intrepid Center of Excellence - Building	0.97	2.35	0.17	0.17	0.29	0.23
ST 03-National Intrepid Center of Excellence - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 04-Mulligan Road Phase II - Clearing	0.61	1.67	0.61	0.13	0.24	0.19
ST 04-Mulligan Road Phase II - Paving	0.16	0.33	0.03	0.03	0.05	0.03
ST 05-Fisher House 1 - Clearing	0.05	0.15	0.05	0.01	0.02	0.02
ST 05-Fisher House 1 - Building	0.85	2.06	0.15	0.15	0.25	0.20
ST 05-Fisher House 1 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 06-USO Family Center - Clearing	0.06	0.16	0.06	0.01	0.02	0.02
ST 06-USO Family Center - Building	1.06	2.58	0.19	0.18	0.31	0.25
ST 06-USO Family Center - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 07-DAAF Firehouse Expansion - Clearing	0.05	0.15	0.05	0.01	0.02	0.02
ST 07-DAAF Firehouse Expansion - Building	0.76	1.85	0.13	0.13	0.23	0.18
ST 07-DAAF Firehouse Expansion - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 08-CDC 144 - Clearing	0.06	0.16	0.06	0.01	0.02	0.02
ST 08-CDC 144 - Building	0.89	2.16	0.16	0.15	0.26	0.21
ST 08-CDC 144 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 09-Family Travel Camp Phase 1 - Clearing	0.08	0.22	0.08	0.02	0.03	0.02
ST 09-Family Travel Camp Phase 1 - Building	0.73	1.78	0.13	0.12	0.22	0.17
ST 09-Family Travel Camp Phase 1 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 11-CDC 1 - Clearing	0.08	0.18	0.01	0.01	0.03	0.01
ST 11-CDC 1 - Building	0.84	2.01	0.15	0.14	0.25	0.19
ST 11-CDC 1 - Paving	0.01	0.02	<0.01	<0.01	<0.01	<0.01
ST 12-CDC 2 - Clearing	0.07	0.16	0.01	0.01	0.03	0.01
ST 12-CDC 2 - Building	0.84	2.01	0.15	0.14	0.25	0.19
ST 12-CDC 2 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01

Project	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
ST 13-- Lieber Gate - Clearing	0.09	0.22	0.02	0.01	0.03	0.02
ST 13- Lieber Gate - Building	0.71	1.72	0.13	0.12	0.22	0.16
ST 13-- Lieber Gate - Paving	0.02	0.04	<0.01	<0.01	0.01	<0.01
ST 14- Stormwater Management Facility - Clearing	0.08	0.18	0.01	0.01	0.03	0.01
ST 14- Stormwater Management Facility - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 15-AAFES Car Wash - Clearing	0.07	0.16	0.01	0.01	0.03	0.01
ST 15-AAFES Car Wash - Building	0.71	1.70	0.12	0.12	0.21	0.16
ST 15-AAFES Car Wash - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 16-PX - Demolition	0.26	0.61	0.04	0.04	0.09	0.04
ST 17-Reconfigure Golf Course - Clearing	2.06	4.89	0.33	0.32	0.75	0.36
ST 17-Reconfigure Golf Course - Paving	0.11	0.24	0.02	0.02	0.03	0.02
ST 18-NMUSA -Roads and Infrastructure - Clearing	1.03	2.45	0.17	0.16	0.38	0.18
ST 18-NMUSA -Roads and Infrastructure - Paving	0.51	1.07	0.09	0.09	0.16	0.09
ST 19-INSCOM Phase 1 - Clearing	0.09	0.20	0.01	0.01	0.03	0.01
ST 19-INSCOM Phase 1 - Building	11.81	29.40	2.08	2.02	3.61	2.82
ST 19-INSCOM Phase 1 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 20-South Post Fire Station - Clearing	0.07	0.16	0.01	0.01	0.03	0.01
ST 20-South Post Fire Station - Building	0.84	2.01	0.15	0.14	0.25	0.19
ST 20-South Post Fire Station - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 21-AAFES Car Care Center - Clearing	0.07	0.16	0.01	0.01	0.03	0.01
ST 21-AAFES Car Care Center - Building	0.81	1.96	0.14	0.14	0.25	0.19
ST 21-AAFES Car Care Center Station - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 22-Pet Care Center - Clearing	0.07	0.16	0.01	0.01	0.03	0.01
ST 22-Pet Care Center - Building	0.76	1.83	0.13	0.13	0.23	0.18
ST 22-Pet Care Center Station - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 23-NGA Canine Training/ Rest Facility - Clearing	0.07	0.16	0.01	0.01	0.03	0.01
ST 23-NGA Canine Training/ Rest Facility - Building	0.71	1.70	0.12	0.12	0.21	0.16
ST 23-NGA Canine Training/ Facility Station - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 24-Fairfax County School Expansion - Clearing	0.09	0.22	0.02	0.01	0.03	0.02
ST 24-Fairfax County School Expansion - Building	2.05	4.93	0.36	0.35	0.62	0.47
ST 24-Fairfax County School Expansion - Paving	0.01	0.02	<0.01	<0.01	<0.01	<0.01
ST 25-Casual Dining Restaurant - Clearing	0.07	0.15	0.01	0.01	0.03	0.01
ST 25-Casual Dining Restaurant - Building	0.76	1.82	0.13	0.13	0.24	0.17
ST 25-Casual Dining Restaurant - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 26-INSCOM Phase 2 - Clearing	0.08	0.19	0.01	0.01	0.03	0.01
ST 26-INSCOM Phase 2 - Building	4.42	10.98	0.78	0.76	1.39	1.05
ST 26-INSCOM Phase 2 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 27-NMUSA Phase 1 - Clearing	0.26	0.61	0.04	0.04	0.10	0.04
ST 27-NMUSA Phase 1 - Building	4.30	10.67	0.76	0.73	1.36	1.02
ST 27-NMUSA Phase 1 - Paving	0.03	0.06	<0.01	<0.01	0.01	<0.01
ST 28-Main Post Commissary - Clearing	0.28	0.65	0.05	0.04	0.11	0.05
ST 28-Main Post Commissary - Building	4.10	10.18	0.72	0.70	1.29	0.97
ST 28-Main Post Commissary - Paving	0.01	0.02	<0.01	<0.01	<0.01	<0.01
ST 29-DLA Visitor Control Center - Clearing	0.07	0.15	0.01	0.01	0.03	0.01
ST 29-DLA Visitor Control Center - Building	0.71	1.69	0.12	0.12	0.22	0.16
ST 29-DLA Visitor Control Center - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 30-Fisher House 2 - Clearing	0.07	0.15	0.01	0.01	0.03	0.01
ST 30-Fisher House 2 - Building	0.81	1.92	0.14	0.14	0.25	0.18
ST 30-Fisher House 2 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01

Project	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
ST 31-Family Travel Camp Phase 2 - Clearing	0.07	0.15	0.01	0.01	0.03	0.01
ST 31-Family Travel Camp Phase 2 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 32-249th Infantry HQ - Clearing	0.21	0.47	0.03	0.03	0.08	0.03
ST 32-249th Infantry HQ - Building	1.74	4.08	0.30	0.29	0.55	0.39
ST 32-249th Infantry HQ - Paving	0.01	0.02	<0.01	<0.01	<0.01	<0.01
ST 33-INSCOM Phase 3 - Clearing	0.08	0.18	0.01	0.01	0.03	0.01
ST 33-INSCOM Phase 3 - Building	4.31	10.55	0.76	0.73	1.39	1.00
ST 33-INSCOM Phase 3 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 34-NMUSA Phase 2 - Clearing	0.26	0.58	0.04	0.04	0.10	0.04
ST 34-NMUSA Phase 2 - Building	1.14	2.69	0.20	0.19	0.36	0.25
ST 34-NMUSA Phase 2 - Paving	0.03	0.05	<0.01	<0.01	0.01	<0.01
ST 35-Retail Fuel Point - Clearing	0.06	0.14	0.01	0.01	0.03	0.01
ST 35-Retail Fuel Point - Building	0.67	1.57	0.12	0.11	0.21	0.15
ST 35-Retail Fuel Point - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 36-29th Infantry HQ - Clearing	0.08	0.18	0.02	0.02	0.03	0.01
ST 36-29th Infantry HQ - Building	1.06	2.48	0.20	0.19	0.35	0.23
ST 36-29th Infantry HQ - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 37-Medical Office Building - Clearing	0.06	0.13	0.01	0.01	0.02	0.01
ST 37-Medical Office Building - Building	0.92	2.15	0.17	0.17	0.30	0.20
ST 37-Medical Office Building - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 38-NMUSA Phase 3 - Clearing	0.24	0.53	0.05	0.05	0.10	0.04
ST 38-NMUSA Phase 3 - Building	1.11	2.58	0.20	0.20	0.36	0.24
ST 38-NMUSA Phase 3 - Paving	0.03	0.05	<0.01	<0.01	0.01	<0.01
ST 39-Multipurpose Fields - Clearing	0.07	0.15	0.01	0.01	0.03	0.01
ST 39-Multipurpose Fields - Paving	0.10	0.20	0.02	0.02	0.03	0.02
ST 40-DLA Parking Garage - Clearing	0.06	0.13	0.01	0.01	0.02	0.01
ST 40-DLA Parking Garage - Building	16.68	40.52	3.13	3.03	5.55	3.82
ST 40-DLA Parking Garage - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 41-NMUSA Phase 4 - Clearing	0.21	0.49	0.05	0.05	0.10	0.04
ST 41-NMUSA Phase 4 - Building	1.06	2.47	0.21	0.21	0.35	0.23
ST 41-NMUSA Phase 4 - Paving	0.02	0.05	0.01	<0.01	0.01	<0.01
ST 42-Unaccompanied Personnel Barracks - Clearing	0.05	0.12	0.01	0.01	0.02	0.01
ST 42-Unaccompanied Personnel Barracks - Building	3.07	7.48	0.64	0.62	1.06	0.70
ST 42-Unaccompanied Personnel Barracks - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 43-OSEG Training Compound - Clearing	0.08	0.18	0.02	0.02	0.04	0.01
ST 43-OSEG Training Compound - Building	1.73	4.03	0.35	0.34	0.58	0.38
ST 43-OSEG Training Compound - Paving	0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 44-Baseball Field Replacement - Clearing	0.05	0.12	0.01	0.01	0.02	0.01
ST 45-Secure Admin Facility - Clearing	0.01	0.03	<0.01	<0.01	0.01	<0.01
ST 45-Secure Admin Facility - Building	3.14	7.65	0.65	0.63	1.08	0.72
ST 45-Secure Admin Facility - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 46-INSCOM Phase 4 - Clearing	0.07	0.15	0.02	0.02	0.03	0.01
ST 46-INSCOM Phase 4 - Building	3.09	7.54	0.64	0.62	1.07	0.71
ST 46-INSCOM Phase 4 - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 47-Relgious Education Center - Clearing	0.05	0.12	0.01	0.01	0.02	0.01
ST 47-Relgious Education Center - Building	0.83	1.95	0.17	0.16	0.28	0.18
ST 47-Relgious Education Center - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 48-INSCOM Warehouse - Clearing	0.07	0.17	0.02	0.02	0.03	0.01
ST 48-INSCOM Warehouse - Building	1.31	3.05	0.26	0.26	0.44	0.29

Project	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
ST 48-INSCOM Warehouse - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 49-911th ECO Complex - Clearing	0.07	0.17	0.02	0.02	0.03	0.01
ST 49-911th ECO Complex - Building	1.10	2.56	0.22	0.21	0.37	0.24
ST 49-911th ECO Complex - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 50-Vehicle Maintenance Shop - Clearing	0.05	0.12	0.01	0.01	0.02	0.01
ST 50-Vehicle Maintenance Shop - Building	0.92	2.15	0.19	0.18	0.31	0.20
ST 50-Vehicle Maintenance Shop - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 51-NECIS Facility - Clearing	0.05	0.12	0.01	0.01	0.02	0.01
ST 51- NECIS Facility - Building	1.53	3.56	0.31	0.30	0.51	0.33
ST 51- NECIS Facility - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
ST 52-DLA HQ Building - Clearing	0.06	0.14	0.02	0.01	0.03	0.01
ST 52-DLA HQ Building - Building	6.34	15.21	1.30	1.26	2.17	1.43
ST 52-DLA HQ Building - Paving	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Total Non-Road	112.66	273.60	21.92	20.19	36.58	25.71

Sources: USEPA 2012 and SQAQMD 1993

Table E-9. Architectural Coating Emissions (Paint)

Project	Floor Area	Wall Surface	VOC [tons]
ST 01-New PX - Building	270,000	540,000	1.41
ST 02-PAL - Building	103,402	206,804	0.54
ST 03-National Intrepid Center of Excellence - Building	18,078	36,156	0.09
ST 05-Fisher House 1 - Building	10,000	20,000	0.05
ST 06-USO Family Center - Building	25,000	50,000	0.13
ST 07-DAAF Firehouse Expansion - Building	4,050	8,100	0.02
ST 08-CDC 144 - Building	13,020	26,040	0.07
ST 09-Family Travel Camp Phase 1 - Building	1,658	3,316	0.01
ST 11-CDC 1 - Building	10,640	21,280	0.06
ST 12-CDC 2 - Building	10,640	21,280	0.06
ST 13-Access Road & Control Point - Lieber Gate - Building	1,500	3,000	0.01
ST 15-AAFES Car Wash - Building	1,350	2,700	0.01
ST 19-INSCOM Phase 1 - Building	420,000	840,000	2.19
ST 20-South Post Fire Station - Building	10,297	20,594	0.05
ST 21-AAFES Car Care Center - Building	9,000	18,000	0.05
ST 22-Pet Care Center - Building	5,200	10,400	0.03
ST 23-NGA Canine Training/ Rest Facility - Building	1,200	2,400	0.01
ST 24-Fairfax County School Expansion - Building	98,400	196,800	0.51
ST 25-Casual Dining Restaurant - Building	6,500	13,000	0.03
ST 26-INSCOM Phase 2 - Building	188,000	376,000	0.98
ST 27-NMUSA Phase 1 - Building	195,130	390,260	1.02
ST 28-Main Post Commissary - Building	132,000	264,000	0.69
ST 29-DLA Visitor Control Center - Building	2,960	5,920	0.02
ST 30-Fisher House 2 - Building	10,000	20,000	0.05
ST 32-249th Infantry HQ - Building	81,783	163,566	0.43
ST 33-INSCOM Phase 3 - Building	194,000	388,000	1.01
ST 34-NMUSA Phase 2 - Building	36,667	73,334	0.19
ST 35-Retail Fuel Point - Building	784	1,568	0.00
ST 36-29th Infantry HQ - Building	33,258	66,516	0.17
ST 37-Medical Office Building - Building	21,948	43,896	0.11
ST 38-NMUSA Phase 3 - Building	36,667	73,334	0.19
ST 40-DLA Parking Garage - Building	700,000	1,400,000	3.66
ST 41-NMUSA Phase 4 - Building	36,667	73,334	0.19
ST 42-Unaccompanied Enlisted Personnel Barracks - Building	103,960	207,920	0.54
ST 43-OSEG Training Compound - Building	91,531	183,062	0.48
ST 45-Secure Admin Facility - Building	107,193	214,386	0.56
ST 46-INSCOM Phase 4 - Building	105,000	210,000	0.55
ST 47-Relgious Education Center - Building	18,093	36,186	0.09
ST 48-INSCOM Warehouse - Building	57,116	114,232	0.30
ST 49-911th Engineering Company Operations Complex - Building	39,810	79,620	0.21
ST 50-Vehicle Maintenance Shop - Building	25,565	51,130	0.13
ST 51-Network Enterprise Center Information Systems Facility - Building	75,000	150,000	0.39
ST 52-DLA HQ Building - Building	267,000	534,000	1.40

Note: EFVOC = 2.09 lbs/gallon x 2.5 gallons/1,000 sqft = 5.225 lbs/1,000 sqft
Sources: SQAQMD 1993 and 9 VAC 5 Chapter 45, Article 5

Table E-10. Paving Off-Gas Emissions

Project	Paved Area	VOC [tons]
ST 01-New PX - Building	16.78	0.02
ST 02-PAL - Building	2.05	<0.01
ST 03-National Intrepid Center of Excellence - Building	0.57	<0.01
ST 05-Fisher House 1 - Building	20.04	0.03
ST 06-USO Family Center - Building	0.64	<0.01
ST 07-DAAF Firehouse Expansion - Building	0.59	<0.01
ST 08-CDC 144 - Building	0.01	<0.01
ST 09-Family Travel Camp Phase 1 - Building	1.05	<0.01
ST 11-CDC 1 - Building	1.60	<0.01
ST 12-CDC 2 - Building	2.32	<0.01
ST 13-Access Road & Control Point - Lieber Gate - Building	0.22	<0.01
ST 15-AAFES Car Wash - Building	6.01	0.01
ST 19-INSCOM Phase 1 - Building	0.23	<0.01
ST 20-South Post Fire Station - Building	0.10	<0.01
ST 21-AAFES Car Care Center - Building	1.30	<0.01
ST 22-Pet Care Center - Building	8.28	<0.01
ST 23-NGA Canine Training/ Rest Facility - Building	1.08	<0.01
ST 24-Fairfax County School Expansion - Building	0.07	<0.01
ST 25-Casual Dining Restaurant - Building	0.01	<0.01
ST 26-INSCOM Phase 2 - Building	0.20	<0.01
ST 27-NMUSA Phase 1 - Building	0.03	<0.01
ST 28-Main Post Commissary - Building	2.01	<0.01
ST 29-DLA Visitor Control Center - Building	0.15	<0.01
ST 30-Fisher House 2 - Building	1.08	<0.01
ST 32-249th Infantry HQ - Building	8.28	0.01
ST 33-INSCOM Phase 3 - Building	2.18	<0.01
ST 34-NMUSA Phase 2 - Building	0.35	<0.01
ST 35-Retail Fuel Point - Building	0.50	<0.01
ST 36-29th Infantry HQ - Building	0.94	<0.01
ST 37-Medical Office Building - Building	4.11	0.01
ST 38-NMUSA Phase 3 - Building	1.08	<0.01
ST 40-DLA Parking Garage - Building	8.28	0.01
ST 41-NMUSA Phase 4 - Building	0.78	<0.01
ST 42-Unaccompanied Enlisted Personnel Barracks - Building	0.76	<0.01
ST 43-OSEG Training Compound - Building	0.45	<0.01
ST 45-Secure Admin Facility - Building	8.28	0.01
ST 46-INSCOM Phase 4 - Building	0.36	<0.01
ST 47-Relgious Education Center - Building	0.40	<0.01
ST 48-INSCOM Warehouse - Building	8.28	0.01
ST 49-911th Engineering Company Operations Complex - Building	0.20	<0.01
ST 50-Vehicle Maintenance Shop - Building	3.15	<0.01
ST 51-Network Enterprise Center Information Systems Facility - Building	0.35	<0.01
ST 52-DLA HQ Building - Building	1.08	<0.01

Note: EFVOC = 2.62 lbs/1,000 acre

Table E-11. Fugitive Dust Emissions

Project	Duration of Grading [days]	Cleared Area [acres]	PM_{10} [tons]	$PM_{2.5}$ [tons]
ST 01-New PX - Building	20	24.37	1.10	0.16
ST 02-PAL - Building	10	5.41	0.19	0.03
ST 03-National Intrepid Center of Excellence - Building	9	2.81	0.10	0.01
ST 05-Fisher House 1 - Building	23	32.06	1.53	0.23
ST 06-USO Family Center - Building	8	1.80	0.06	0.01
ST 07-DAAF Firehouse Expansion - Building	9	3.46	0.12	0.02
ST 08-CDC 144 - Building	8	0.43	0.01	<0.01
ST 09-Family Travel Camp Phase 1 - Building	9	3.69	0.13	0.02
ST 11-CDC 1 - Building	12	9.66	0.37	0.05
ST 12-CDC 2 - Building	9	3.21	0.11	0.02
ST 13-Access Road & Control Point - Lieber Gate - Building	8	0.50	0.02	<0.01
ST 15-AAFES Car Wash - Building	11	8.02	0.30	0.04
ST 19-INSCOM Phase 1 - Building	9	3.51	0.12	0.02
ST 20-South Post Fire Station - Building	8	0.13	<0.01	<0.01
ST 21-AAFES Car Care Center - Building	30	3.20	0.17	0.03
ST 22-Pet Care Center - Building	60	33.86	2.74	0.41
ST 23-NGA Canine Training/ Rest Facility - Building	60	16.55	1.34	0.20
ST 24-Fairfax County School Expansion - Building	10	5.49	0.20	0.03
ST 25-Casual Dining Restaurant - Building	8	1.46	0.05	0.01
ST 26-INSCOM Phase 2 - Building	8	0.16	0.01	<0.01
ST 27-NMUSA Phase 1 - Building	8	1.00	0.03	0.01
ST 28-Main Post Commissary - Building	8	0.49	0.02	<0.01
ST 29-DLA Visitor Control Center - Building	11	6.25	0.23	0.03
ST 30-Fisher House 2 - Building	8	0.20	0.01	<0.01
ST 32-249th Infantry HQ - Building	10	5.49	0.20	0.03
ST 33-INSCOM Phase 3 - Building	16	16.55	0.69	0.10
ST 34-NMUSA Phase 2 - Building	17	19.44	0.82	0.12
ST 35-Retail Fuel Point - Building	8	0.46	0.02	<0.01
ST 36-29th Infantry HQ - Building	8	1.80	0.06	0.01
ST 37-Medical Office Building - Building	8	1.26	0.04	0.01
ST 38-NMUSA Phase 3 - Building	13	10.52	0.41	0.06
ST 40-DLA Parking Garage - Building	10	5.49	0.20	0.03
ST 41-NMUSA Phase 4 - Building	16	16.55	0.69	0.10
ST 42-Unaccompanied Personnel Barracks - Building	8	1.04	0.04	0.01
ST 43-OSEG Training Compound - Building	11	7.37	0.27	0.04
ST 45-Secure Admin Facility - Building	8	0.60	0.02	<0.01
ST 46-INSCOM Phase 4 - Building	16	16.55	0.69	0.10
ST 47-Relgious Education Center - Building	9	2.35	0.08	0.01
ST 48-INSCOM Warehouse - Building	8	1.20	0.04	0.01
ST 49-911th ECOC - Building	16	16.55	0.69	0.10
ST 50-Vehicle Maintenance Shop - Building	8	0.61	0.02	<0.01
ST 51-NECIS Facility - Building	12	9.02	0.34	0.05
ST 52-DLA HQ Building - Building	8	0.92	0.03	<0.01

Sources: USEPA 1995 and USEPA 2005b

Notes: $PM_{10}/TSP = 0.45$

$PM_{2.5}/PM_{10} = 0.15$

EF TSP = 80 lbs/acre/day

Table E-12. Worker Trip Emissions

Project	VMT	EF CO	CO [tons]	EF NO_x	NO_x [tons]	EF PM_{10}	PM_{10} [tons]	EF $PM_{2.5}$	$PM_{2.5}$	EF SO_2	SO_2	EF VOC	VOC
ST 01-New PX - Clearing	18,274	4.05	0.08	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 01-New PX - Building	1,551,312	4.05	6.92	0.32	0.54	0.01	0.02	0.01	0.02	0.01	0.02	0.29	0.50
ST 01-New PX - Paving	5,664	4.05	0.03	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 02-PAL - Clearing	2,029	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 02-PAL - Building	488,016	4.05	2.18	0.32	0.17	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.16
ST 02-PAL - Paving	154	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 03-NICE - Clearing	947	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 03- NICE - Building	38,023	4.05	0.17	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 03- NICE - Paving	21	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 04-Mulligan Road Phase II - Clearing	27,652	4.05	0.12	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 04-Mulligan Road Phase II - Paving	7,514	4.05	0.03	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 05-Fisher House 1 - Clearing	541	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 05-Fisher House 1 - Building	18,468	4.05	0.08	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 05-Fisher House 1 - Paving	24	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 06-USO Family Center - Clearing	1,167	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 06-USO Family Center - Building	57,713	4.05	0.26	0.32	0.02	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.02
ST 06-USO Family Center - Paving	22	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 07-DAAF Firehouse Expansion - Clearing	129	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 07-DAAF Firehouse Expansion - Building	6,718	4.05	0.03	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 07-DAAF Firehouse Expansion - Paving	0	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 08-CDC 144 - Clearing	1,244	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 08-CDC 144 - Building	25,159	4.05	0.11	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 08-CDC 144 - Paving	39	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 09-Family Travel Camp Phase 1 - Clearing	4,346	4.05	0.02	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 09-Family Travel Camp Phase 1 - Building	2,637	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 09-Family Travel Camp Phase 1 - Paving	60	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 11-CDC 1 - Clearing	1,082	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 11-CDC 1 - Building	19,832	4.05	0.09	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 11-CDC 1 - Paving	174	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 12-CDC 2 - Clearing	150	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 12-CDC 2 - Building	19,832	4.05	0.09	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 12-CDC 2 - Paving	8	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 13- Lieber Gate - Clearing	3,306	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 13-- Lieber Gate - Building	2,385	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 13- Lieber Gate - Paving	676	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 14- Stormwater Facility - Clearing	1,183	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 14- Stormwater Facility - Paving	9	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 15-AAFES Car Wash - Clearing	38	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01

Project	VMT	EF CO	CO [tons]	EF NO_x	NO_x [tons]	EF PM_{10}	PM_{10} [tons]	EF $PM_{2.5}$	$PM_{2.5}$	EF SO_2	SO_2	EF VOC	VOC
ST 15-AAFES Car Wash - Building	2,124	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 15-AAFES Car Wash - Paving	4	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 16-PX - Demolition	3,595	4.05	0.02	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 17-Reconfigure Golf Course - Clearing	76,193	4.05	0.34	0.32	0.03	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.02
ST 17-Reconfigure Golf Course - Paving	1,465	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 18-NMUSA -- Clearing	37,240	4.05	0.17	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 18-NMUSA -- Paving	27,930	4.05	0.12	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 19-INSCOM Phase 1 - Clearing	2,060	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 19-INSCOM Phase 1 - Building	2,542,428	4.05	11.33	0.32	0.88	0.01	0.03	0.01	0.03	0.01	0.03	0.29	0.81
ST 19-INSCOM Phase 1 - Paving	40	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 20-South Post Fire Station - Clearing	437	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 20-South Post Fire Station - Building	19,193	4.05	0.09	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 20-South Post Fire Station - Paving	3	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 21-AAFES Car Care Center - Clearing	48	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 21-AAFES Car Care Center - Building	16,313	4.05	0.07	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 21-AAFES Car Care Center - Paving	0	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 22-Pet Care Center - Clearing	301	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 22-Pet Care Center - Building	8,803	4.05	0.04	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 22-Pet Care Center Station - Paving	8	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 23-NGA Canine Training/Facility - Clearing	147	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 23-NGA Canine Training/Facility - Building	1,888	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 23-NGA Canine Training/Facility - Paving	1	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 24-Fairfax County School - Clearing	2,579	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 24-Fairfax County School - Building	449,265	4.05	2.00	0.32	0.16	0.01	0.01	0.01	0.01	0.01	<0.01	0.29	0.14
ST 24-Fairfax County School - Paving	151	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 25-Casual Dining Restaurant - Clearing	60	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 25-Casual Dining Restaurant - Building	11,337	4.05	0.05	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 25-Casual Dining Restaurant - Paving	6	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 26-INSCOM Phase 2 - Clearing	2,060	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 26-INSCOM Phase 2 - Building	1,138,039	4.05	5.07	0.32	0.40	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.36
ST 26-INSCOM Phase 2 - Paving	40	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 27-NMUSA Phase 1 - Clearing	9,931	4.05	0.04	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 27-NMUSA Phase 1 - Building	1,147,833	4.05	5.12	0.32	0.40	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.37
ST 27-NMUSA Phase 1 - Paving	1,552	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 28-Main Post Commissary - Clearing	12,391	4.05	0.06	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 28-Main Post Commissary - Building	740,362	4.05	3.30	0.32	0.26	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.24
ST 28-Main Post Commissary - Paving	164	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 29-DLA Visitor Control Center - Clearing	139	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 29-DLA Visitor Control Center - Building	4,809	4.05	0.02	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 29-DLA Visitor Control Center - Paving	13	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 30-Fisher House 2 - Clearing	541	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01

Project	VMT	EF CO	CO [tons]	EF NO_x	NO_x [tons]	EF PM_{10}	PM_{10} [tons]	EF $PM_{2.5}$	$PM_{2.5}$	EF SO_2	SO_2	EF VOC	VOC
ST 30-Fisher House 2 - Building	18,468	4.05	0.08	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 30-Fisher House 2 - Paving	19	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 31-Family Travel Camp Phase 2 - Clearing	377	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 31-Family Travel Camp Phase 2 - Paving	35	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 32-249th Infantry HQ - Clearing	5,128	4.05	0.02	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 32-249th Infantry HQ - Building	331,442	4.05	1.48	0.32	0.12	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.11
ST 32-249th Infantry HQ - Paving	462	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 33-INSCOM Phase 3 - Clearing	2,060	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 33-INSCOM Phase 3 - Building	1,174,360	4.05	5.23	0.32	0.41	0.01	0.02	0.01	0.01	0.01	0.01	0.29	0.38
ST 33-INSCOM Phase 3 - Paving	40	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 34-NMUSA Phase 2 - Clearing	9,931	4.05	0.04	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 34-NMUSA Phase 2 - Building	97,813	4.05	0.44	0.32	0.03	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.03
ST 34-NMUSA Phase 2 - Paving	1,552	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 35-Retail Fuel Point - Clearing	313	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 35-Retail Fuel Point - Building	1,220	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 35-Retail Fuel Point - Paving	29	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 36-29th Infantry HQ - Clearing	3,042	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 36-29th Infantry HQ - Building	85,307	4.05	0.38	0.32	0.03	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.03
ST 36-29th Infantry HQ - Paving	29	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 37-Medical Office Building - Clearing	180	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 37-Medical Office Building - Building	48,790	4.05	0.22	0.32	0.02	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.02
ST 37-Medical Office Building - Paving	17	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 38-NMUSA Phase 3 - Clearing	9,931	4.05	0.04	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 38-NMUSA Phase 3 - Building	97,813	4.05	0.44	0.32	0.03	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.03
ST 38-NMUSA Phase 3 - Paving	1,552	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 39-Multipurpose Fields - Clearing	795	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 39-Multipurpose Fields - Paving	406	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 40-DLA Parking Garage - Clearing	361	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 40-DLA Parking Garage - Building	4,261,320	4.05	19.00	0.32	1.48	0.01	0.05	0.01	0.05	0.01	0.04	0.29	1.36
ST 40-DLA Parking Garage - Paving	15	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 41-NMUSA Phase 4 - Clearing	9,931	4.05	0.04	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 41-NMUSA Phase 4 - Building	97,813	4.05	0.44	0.32	0.03	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.03
ST 41-NMUSA Phase 4 - Paving	1,552	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 42-UPH - Clearing	183	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 42- UPH - Building	492,427	4.05	2.20	0.32	0.17	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.16
ST 42- UPH - Paving	8	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 43-OSEG Training Compound - Clearing	4,058	4.05	0.02	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 43-OSEG Training Compound - Building	399,121	4.05	1.78	0.32	0.14	0.01	0.01	0.01	<0.01	0.01	<0.01	0.29	0.13
ST 43-OSEG Training Compound - Paving	236	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 44-Baseball Field Replacement - Clearing	277	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 45-Secure Admin Facility - Clearing	289	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01

Project	VMT	EF CO	CO [tons]	EF NO_x	NO_x [tons]	EF PM_{10}	PM_{10} [tons]	EF $PM_{2.5}$	$PM_{2.5}$	EF SO_2	SO_2	EF VOC	VOC
ST 45-Secure Admin Facility - Building	518,739	4.05	2.31	0.32	0.18	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.17
ST 45-Secure Admin Facility - Paving	13	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 46-INSCOM Phase 4 - Clearing	2,060	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 46-INSCOM Phase 4 - Building	500,945	4.05	2.23	0.32	0.17	0.01	0.01	0.01	0.01	0.01	0.01	0.29	0.16
ST 46-INSCOM Phase 4 - Paving	40	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 47-Relgious Education Center - Clearing	337	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 47-Relgious Education Center - Building	38,055	4.05	0.17	0.32	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.01
ST 47-Relgious Education Center - Paving	24	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 48-INSCOM Warehouse - Clearing	2,827	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 48-INSCOM Warehouse - Building	188,500	4.05	0.84	0.32	0.07	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.06
ST 48-INSCOM Warehouse - Paving	21	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 49-911th ECOC - Clearing	2,827	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 49-911th ECOC - Building	110,282	4.05	0.49	0.32	0.04	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.04
ST 49-911th ECOC - Paving	25	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 50-Vehicle Maintenance Shop - Clearing	106	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 50-Vehicle Maintenance Shop - Building	59,454	4.05	0.27	0.32	0.02	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.02
ST 50-Vehicle Maintenance Shop - Paving	9	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 51-NECISF - Clearing	255	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 51- NECISF - Building	288,563	4.05	1.29	0.32	0.10	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	0.09
ST 51- NECISF - Paving	4	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 52-DLA HQ Building - Clearing	1,304	4.05	0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01
ST 52-DLA HQ Building - Building	1,620,824	4.05	7.22	0.32	0.56	0.01	0.02	0.01	0.02	0.01	0.02	0.29	0.52
ST 52-DLA HQ Building - Paving	68	4.05	<0.01	0.32	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.29	<0.01

Sources: USEPA 2012 and SQAQMD 1993

Table E-13. Estimated Construction Emissions - ST40 and ST52

		Estimated Annual Air Emissions (tpy)					
Project - ST 40-DLA Parking Garage		**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	Clearing	0.06	0.13	0.01	0.01	0.02	0.01
Heavy Equipment Emissions	Building	16.68	40.52	3.13	3.03	5.55	3.82
Heavy Equipment Emissions	Paving	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Worker Trip Emissions	Clearing	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Worker Trip Emissions	Building	19	1.48	0.05	0.05	0.04	3.66
Worker Trip Emissions	Paving	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Architectural Coating Emissions	Building	-	-	-	-	-	1.46
Paving Off-gas Emissions	Paving	-	-	-	-	-	0.0005
Fugitive Dust Emissions	Clearing	-	-	0.04	0.01	-	-
	Total	**35.7**	**42.1**	**3.2**	**3.1**	**5.6**	**8.9**
Alternative 1 (Year 5)		40.5	50.7	5	3.9	6.9	10.3
Alternative 2 (Year 5)		4.8	8.6	1.8	0.8	1.3	1.3
		Estimated Annual Air Emissions (tpy)					
Project - ST 52-DLA HQ Building		**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	Clearing	0.06	0.14	0.02	0.01	0.03	0.01
Heavy Equipment Emissions	Building	6.34	15.21	1.30	1.26	2.17	1.43
Heavy Equipment Emissions	Paving	0.0029	0.0063	0.0006	0.0006	0.0011	0.0005
Worker Trip Emissions	Clearing	0.01	<0.1	<0.1	<0.1	<0.1	<0.1
Worker Trip Emissions	Building	7.22	0.56	<0.1	<0.1	<0.1	<0.1
Worker Trip Emissions	Paving	-	-	-	-	-	0
Architectural Coating Emissions	Building	-	-	-	-	-	1.4
Paving Off-gas Emissions	Paving	-	-	-	-	-	0.0024
Fugitive Dust Emissions	Clearing	-	-	0.14	0.02	-	-
	Total	**13.6**	**15.9**	**1.5**	**1.3**	**2.2**	**2.8**
Alternative 1 (Year 6)		44.4	44.4	61.2	7.3	5.4	8.7
Alternative 2 (Year 6)		30.8	30.8	45.3	5.8	4.1	6.5

Table E-14. Estimated Construction Emissions - Alternative 2

Activity/Source	**NO_x**	**$PM_{2.5}$**	**SO_2**	**VOC**
Construction Emissions (Year 1)	45.1	3.7	5.4	7.5
Construction Emissions (Year 2)	61.8	5.0	7.9	9.6
Construction Emissions (Year 3)	40.5	3.0	5.1	7.5
Construction Emissions (Year 4)	20.9	1.7	2.8	4.2
Construction Emissions (Year 5)	8.6	0.8	1.3	1.3
Construction Emissions (Year 6)	45.3	4.1	6.5	8.9
Average	**37.0**	**3.0**	**4.8**	**6.5**

Table E-15. Estimated Construction Emissions - Alternative 3

Activity/Source	Estimated Annual Air Emissions (tpy)			
	NO_x	$PM_{2.5}$	SO_2	VOC
Estimated Construction Emissions Shifted to Long-Term Projects				
Construction Emissions (Year 1)	0.0	0.0	0.0	0.0
Construction Emissions (Year 2)	14.6	1.6	1.7	1.6
Construction Emissions (Year 3)	28.9	2.2	3.7	4.0
Construction Emissions (Year 4)	5.1	0.5	0.7	0.6
Construction Emissions (Year 5)	3.4	0.4	0.6	0.3
Construction Emissions (Year 6)	22.5	2.1	3.3	3.2
Short-Term Construction Emission (Alternative 1)				
Construction Emissions (Year 1)	45.1	3.7	5.4	7.5
Construction Emissions (Year 2)	61.8	5	7.9	9.6
Construction Emissions (Year 3)	40.5	3	5.1	7.5
Construction Emissions (Year 4)	20.9	1.7	2.8	4.2
Construction Emissions (Year 5)	50.7	3.9	6.9	10.3
Construction Emissions (Year 6)	61.2	5.4	8.7	11.8
Short-Term Construction Emission (Alternative 3)				
Construction Emissions (Year 1)	45.1	3.7	5.4	7.5
Construction Emissions (Year 2)	47.2	3.4	6.2	8.1
Construction Emissions (Year 3)	11.6	0.8	1.4	3.5
Construction Emissions (Year 4)	15.8	1.2	2.1	3.6
Construction Emissions (Year 5)	47.3	3.5	6.3	10.0
Construction Emissions (Year 6)	38.7	3.3	5.4	8.6
Average	**34.3**	**2.7**	**4.5**	**6.9**

Table E-16 Heating Emissions

General Information									
Heating Fuel	Natural Gas								
Region	South								
Heating Requirements	101.2	Btu/sf							
Heating Value	1,020	Btu/scf							
Annual Fuel Use	0.0992	scf/yr/sqft							
Pollutant		**CO**	**NO_x**	**VOC**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Emission Factors (lb/1,000 scf)		8.4E+01	1.9E+02	5.5E+00	6.0E-01	7.6E+00	7.6E+00	1.2E+05
Emission Factors (tpy/1,000 sf)		4.2E-03	9.4E-03	2.7E-04	3.0E-05	3.8E-04	3.8E-04	6.0E+00
Alternative 1	**Heated Area (Sqft)**	**Annual Emissions [tpy]**						
Short-Term	2,771,982	11.6	26.1	0.8	0.1	1.0	1.0	16,501
Long-Term	2,406,000	10.0	22.7	0.7	0.1	0.9	0.9	14,323
Total	5,177,982	21.6	48.8	1.4	0.2	2.0	2.0	30,824
Alternative 2								
Short-Term	2,504,982	10.4	23.6	0.7	0.1	0.9	0.9	14,912
Long-Term	1,173,000	4.9	11.1	0.3	0.0	0.4	0.4	6,983
Total	3,677,982	15.3	34.7	1.0	0.1	1.4	1.4	21,895
Alternative 3								
Short-Term	1,327,459	5.5	12.5	0.4	0.0	0.5	0.5	7,902
Long-Term	3,850,523	16.0	36.3	1.1	0.1	1.5	1.5	22,922
Total	5,177,982	21.6	48.8	1.4	0.2	2.0	2.0	30,824

Sources: USEPA 1995 and DOE 2003

Table E-17 Worker Commutes

General Information								
Miles per Trip	14							
Number of Days	260							
Number of Trips	2							
Commuting Factor	0.6							
Miles/Employee	4368	Emission Factors [lbs/mile]						
	Year	CO	NO_x	VOC	$S0_2$	PM_{10}	$PM_{2.5}$	CO_2
	2017	3.3E-03	2.8E-04	5.9E-05	1.0E-05	1.1E-05	1.0E-05	1.0E-03
	2030	3.0E-03	1.5E-04	4.0E-05	8.7E-06	1.0E-05	9.4E-06	9.2E-04
Alternative 1	**Additional Personnel**	Annual Emissions [tpy]						
Short-Term	4,755	34.5	2.9	0.6	0.1	0.1	0.1	10.6
Long-Term	12,030	80.1	3.8	1.1	0.2	0.3	0.2	24.1
Total	16,785	114.6	6.7	1.7	0.3	0.4	0.4	34.7
Alternative 2								
Short-Term	3,755	27.3	2.3	0.5	0.1	0.1	0.1	8.4
Long-Term	5,530	36.8	1.8	0.5	0.1	0.1	0.1	11.1
Total	9,285	64.1	4.0	1.0	0.2	0.2	0.2	19.5
Alternative 3								
Short-Term	1,589	11.5	1.0	0.2	0.0	0.0	0.0	3.5
Long-Term	15,196	101.2	4.9	1.3	0.3	0.3	0.3	30.5
Total	16,785	112.7	5.8	1.5	0.3	0.4	0.3	34.0

Source: USEPA 2012

Table E-18 Emissions from Generators Exempt from Permitting

Unit Information								
Rated Capacity	1,100	**bkW**						
Horsepower	1,475	**hp**						
Hours of Operation	100	**hr/yr**						
			NO_x	CO	VOC	PM	SO_x	CO_2
Emission Factor	**(g/hp-hr)**		8.92	1.30	0.16	0.133	<0.1	1.150
			Emissions (tpy)					
			NO_x	CO	VOC	PM	SO_x	CO_2
	Number of Units	1	1.45	0.21	0.03	0.02	<0.1	85
Alternative 1 and 2								
Short-Term	Number of Units	12	17.4	2.5	0.3	0.3	<0.1	1,018
Alternative 3								
Short-Term	Number of Units	8	11.6	1.7	0.2	0.2	<0.1	679
Long-Term	Number of Units	4	5.8	0.8	0.1	0.1	<0.1	339

1. Sources: USEPA 1995, and Caterpillar 2011.
2. Assume PM = PM_{10}= $PM_{2.5}$.
3. Generator operates on ultra low sulfur diesel with a sulfur content of 15 ppm (0.0015% sulfur content).
4. Assumes back-up generators exempt from permitting for ST03, ST07, ST13, ST18, ST20, ST23, ST29, ST32, ST43, ST45, ST49, and ST51.

Table E-19 Total Operational Emissions (tpy)

	Annual Emissions (tpy)						
	CO	**NO_x**	**VOC**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Alternative 1							
Short-Term Projects	48.6	46.4	1.7	0.2	1.4	1.4	17,530
Long-Term Projects	90.1	26.5	1.7	0.3	1.2	1.2	14,347
Total	138.7	72.9	3.4	0.5	2.6	2.6	31,877
Alternative 2							
Short-Term Projects	40.2	43.3	1.5	0.2	1.3	1.3	15,938
Long-Term Projects	41.7	12.8	0.8	0.1	0.6	0.6	6,994
Total	81.9	56.1	2.3	0.3	1.9	1.8	22,932
Alternative 3							
Short-Term Projects	18.8	25.1	0.8	0.1	0.7	0.7	8,584
Long-Term Projects	118.0	46.9	2.5	0.4	1.9	1.9	23,292
Total	136.8	72.0	3.3	0.5	2.6	2.6	31,876

Sources: USEPA 1995, EIA 2007, USEPA 2012

References

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E.3 RECORD OF NON-APPLICABILITY (RONA)

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RECORD OF NON-APPLICABILITY

In Accordance with the Clean Air Act- General Conformity Rule For
The Proposed Real Property Master Plan, Fort Belvoir, Virginia.

August 20, 2014

The Army's proposed action is to adopt and implement an updated Real Property Master Plan (RPMP) for Fort Belvoir's Main Post and the Fort Belvoir North Area (FBNA) and to implement the plan's proposed short-term development. Following full implementation of the 2005 Defense Base Closure and Realignment Commission (BRAC) recommendations for Fort Belvoir, the September 2011 Main Post and FBNA workforce was 39,000. Future growth projections for Main Post and the FBNA indicate an increase of about 17,000 personnel by 2030. If fully accommodated, the September 2011 workforce would expand to approximately 56,000 by 2030. The proposed Real Property Master Plan includes short-term construction, demolition, and roadway improvement projects and long-term construction and developments projects to support the Army's mission of establishing optimal land use and optimal allocation of resources. A detailed description of the proposed action and a list of the proposed short- and long-term projects is in Section 2 of the EIS.

Construction activities including the use of construction equipment, worker vehicles (e.g., bulldozers, paving equipment), use of VOC paints, fugitive particles from surface disturbances were included in the analysis. General Conformity under the Clean Air Act, Section 176 has been evaluated according to the requirements of 40 CFR 93.153, Subpart B. Regardless of the alternative ultimately implemented, the requirements of this rule are not applicable because:

> The highest total annual direct and indirect emissions from this action have been estimated at 61.2 tons NO_X, 11.8 tons VOCs, 5.4 tons $PM_{2.5}$, and 8.7 tons SO_2 per year, which would be below the conformity threshold values of 50 tons VOCs and 100 tons for SO_2, $PM_{2.5}$, and NO_X.

Supported documentation and emission estimates:

(X) Are Attached
( ) Appear in the NEPA Documentation
( ) Other (Not Necessary)

_____

Michelle D. Mitchell
Colonel, U.S. Army
Garrison Commander

_____

Date

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APPENDIX F

NATURAL RESOURCES COORDINATION

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CORRESPONDENCE

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July 16, 2013

Mr. John Bullard
Regional Administrator
National Marine Fisheries Service
Northeast Region
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: Fort Belvoir Real Property Master Plan Environmental Impact Statement
Preliminary Coordination

Dear Mr. Bullard

The United States (U.S.) Army Garrison Fort Belvoir is in the process of developing a new Real Property Master Plan (RPMP) for Fort Belvoir's Main Post and the Fort Belvoir North Area (FBNA). They are also preparing an EIS to address adoption of the RPMP and implementation of the plan's proposed short-term (2012 – 2017) development projects. These include 52 site development and seven transportation improvement projects. The EIS will also, to the extent that we have information, address ten long-term (2018 – 2030) development and ten long-term transportation improvement projects.

Fort Belvoir last prepared a master plan in 1993 and amended it in 2002 and 2007. In light of the substantial changes that have occurred on post since 1993, the amended 1993 master plan no longer serves to adequately guide the management and use of real property assets – land, facilities, resources, and infrastructure – on the installation.

Most projects addressed by the new RPMP would be located in the central, upland portion of the Main Post, and many would be located on previously-developed and previously disturbed areas. The short-term projects include 52 site development projects covering a wide range of uses (professional/medical/institutional buildings, elementary schools, parking garages, the new Post Exchange and Commissary, and facilities for other support services). There are also seven short-term transportation projects including intersection improvements, transit hubs, new access control points, and roadway improvements. Some projects, such as the Fort Belvoir Travel Camp, the National Museum of the Army, and the Richmond Highway-Telegraph Road Connector (Mulligan Road) have already been evaluated through the NEPA process, but will be included in this EIS as well to provide the full picture of the RPMP's impacts.

7137 Wilson Road, Marshall, VA 20115

540-349-3263
540-219-0322

The RPMP also addresses ten long-term development "projects" and ten long-term transportation projects. The long-term development projects are really potential suitable sites for development or redevelopment in the future. The long-term transportation projects are largely road and intersection improvements. While the RPMP EIS will be the only NEPA document prepared for the short-term projects, additional NEPA documentation will be prepared for the long-term projects as more specific design information becomes available.

None of the short or long-term projects involve direct impacts to Accotink Creek, Pohick Creek, Dogue Creek, Accotink Bay, Pohick Bay, Gunston Cove, or the Potomac River. The thrust of the RPMP is to reserve large tracts of buildable areas for future campuses and/or phased infill type development. These buildable areas have been configured to the extent feasible to avoid ecologically sensitive areas.

We would like your help in describing: what listed, proposed, and candidate species may be in the action area; what critical or proposed critical habitats may be in the area; and any points-of-contact you think would be helpful. If you need further information, please contact me at 540-219-032. Thank you for your assistance.

Sincerely

Janet C. O'Neill

Janet C. O'Neill
Carter's Run Environmental Corporation

Copies to:

Mr. Marc Russell
Environmental Program Manager-NEPA
DPW-Environmental Division (ENRD)
9430 Jackson Loop, Bldg 1442, Suite 200
Fort Belvoir, VA 22060-5116

Ms. Penny Douglas
AECOM
975 North Washington Street, Suite 300
Alexandria, VA 22314-1939

Carver, Craig

From: JanetO'Neill <janet1118@verizon.net>
Sent: Tuesday, July 23, 2013 12:39 PM
To: christine.vaccaro@noaa.gov
Cc: Douglas, Penny
Subject: Fort Belvoir Real Property Master Plan EIS

Carter's Run Environmental Corporation

Dear Ms. Vaccaro,

Thank you for your telephone call this morning. This email is to confirm that the National Marine Fisheries Service has no concern with adoption of the proposed Fort Belvoir Real Property Master Plan as described in my July 16, 2013 letter, because the plan would not result in any work within the Potomac River or its embayments. If the plan changes, and work within tidal waters is proposed, we will re-coordinate and afford NMFS an opportunity to review and comment.

Thank you, and have a great day.

Janet O'Neill
Carter's Run Environmental Corporation

Carver, Craig

From: Christine Vaccaro - NOAA Federal <christine.vaccaro@noaa.gov>
Sent: Tuesday, July 23, 2013 12:56 PM
To: JanetO'Neill
Cc: Douglas, Penny
Subject: Re: Fort Belvoir Real Property Master Plan EIS

Dear Ms. O'Neill,
That is correct. Because your project will not create any impacts that could possibly effect listed species (i.e., in the Potomac River or other large tidal river), you do not need to coordinate any further with us and we have no concerns with your project.

Cheers,

Chris Vaccaro
Fisheries Biologist
Protected Resources Division
NOAA Fisheries/NERO
Gloucester, MA
Phone: 978-281-9167
Email: christine.vaccaro@noaa.gov

On Tue, Jul 23, 2013 at 12:38 PM, JanetO'Neill <janet1118@verizon.net> wrote:

Carter's Run Environmental Corporation

Dear Ms. Vaccaro,

Thank you for your telephone call this morning. This email is to confirm that the National Marine Fisheries Service has no concern with adoption of the proposed Fort Belvoir Real Property Master Plan as described in my July 16, 2013 letter, because the plan would not result in any work within the Potomac River or its embayments. If the plan changes, and work within tidal waters is proposed, we will re-coordinate and afford NMFS an opportunity to review and comment.

Thank you, and have a great day.

Janet O'Neill
Carter's Run Environmental Corporation

Janet O'Neill

From: JanetO'Neill <janet1118@verizon.net>
Sent: Monday, July 22, 2013 1:48 PM
To: Janet O'Neill
Subject: Fwd: no subject
Attachments: NHServicePDF- Fort Belvoir RPMP EIS.pdf; Fort_Belvoir_USGS_Project_Map.pdf

Jul 22, 2013 12:46:52 PM, janet1118@verizon.net wrote:

Carter's Run Environmental Corporation

Dear Renee:

The Army is in the process of developing a new Real Property Master Plan (RPMP) for Fort Belvoir's Main Post and the Fort Belvoir North Area (FBNA). They are also preparing an EIS to address adoption of the RPMP, and implementation of the plan's proposed short-term (2012 – 2017) development projects. The EIS will also, to the extent that we have information, address ten long-range development and ten long-range transportation improvement projects.

Attached is a USGS map showing the location of Fort Belvoir (Main Post and the North Area), and a Project Review Request form. Please contact me (540-219-0322) if you need more information.

Thank-you!

Janet C. O'Neill

Carter's Run Environmental Corporation, 7137 Wilson Road, Marshall, VA 20115

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INFORMATION SERVICES ORDER FORM
Updated 11/10

Mail or Email to: Project Review Coordinator
DCR Division of Natural Heritage
217 Governor Street
Richmond, VA 23219
Voice: (804) 371-2708 Fax: (804) 371-2674
nhreview@dcr.virginia.gov

ENVIRONMENTAL REVIEW SERVICES:

- ☑ **Project Review** (30 calendar day turnaround)..**$90 per site**; add **$35 for 1-5** natural heritage occurrences (rare plants, rare animals, significant communities and karst) and **$60 for 6** or more occurrences.
  Multi-quad project area **$90 per quad**.
- ☐ **Project Review with Accompanying Map...$250 per site;** for projects with potential impact to Natural Heritage Resources including alternative energy projects, written comments with 8.5 X 11 map displaying Natural Heritage Screening Coverage.
- ☐ **Priority Service** (5 business day turnaround)..**$500 surcharge**

Details: Describe project in the space below, please include detailed project description, project location information including **latitude, longitude,** acreage, and existing site conditions (photographs if available). Attach additional information as necessary. In order to ensure an accurate assessement, please submit **an electronic copy of a site map** (preferably from a USGS topo map with identified project boundaries) and all other information to **nhreview@dcr.virginia.gov** or fax a map to: **Environmental Review Coordinator @(804) 371-2674**. Please include the project title on all correspondence. **Incomplete submittal of information will delay the review process.**

Project Title: Fort Belvoir Real Property Master Plan EIS CREC Project #11120

Project Description:

Fort Belvoir is preparing a Real Property Master Plan (RPMP) for Fort Belvoir's Main Post and the Fort Belvoir North Area (FBNA), and an EIS to address adoption of the RPMP and implementation of the plan's proposed short-term (2012 – 2017) development projects. Most projects would be located in the central, upland portion of the Main Post, and many would be located on previously-developed and previously disturbed areas. The short-term projects include 52 site development projects (professional/medical/institutional buildings, elementary schools, parking garages, and facilities for other support services), and seven transportation projects including intersection improvements, transit hubs, new access control

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points, and roadway improvements. The RPMP will address in a general manner ten long-term potentially suitable sites for development or redevelopment, and ten road and intersection improvements projects.

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DCR
Virginia Department of Conservation & Recreation

INFORMATION SERVICES ORDER FORM
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Natural Heritage Resource Reports & Distribution Maps

☐ **Custom NHR Maps (describe, call for more information).....$80/hour**

☐ **Custom NHR Reports (describe, call for more information).....$60/hour**

SUBSCRIPTION SERVICES: Hyperlink to an example of the license agreement

Natural Heritage Data Explorer Subscription Service

☐ (unlimited access per subscription year, complete a digital license agreement is required).....**$1000/yr**.

Digital Conservation Sites Subscription Service (specify area of interest; complete a digital license agreement is required)

☐ 1 county or 12 quads or less.....**$1000/yr.**

☐ 13-100 quads.....**$3500/yr.**

☐ Statewide coverage.....**$6000/yr.**

Please provide details in the space below: **(failure to provide information will delay subscription processing)**

Conditions:

1. Digitized DCR natural heritage resource locational data for GIS or map production, whether provided by DCR digitally or entered by the client from tables or reports, may not be used without first completing a data licensing agreement with DCR Division of Natural Heritage. A license form is available on request.

2.Although DCR-DNH data are closely quality controlled, DCR-DNH makes no warranty as to the fitness of the data for any purpose.

3. Any publication of data provided by DCR, whether as text, table or map, must acknowledge Virginia DCR-Natural Heritage Program, and include the date the data were provided by DCR

4. If fees are assessed, an invoice will be included with the response. **Please do not pre-pay.** Payment is due within 30 days of receipt. **Minimum charge for hourly fees is $40.**

I understand and agree to the above conditions: ☑ Yes (Required for Fee Services)

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DCR
Virginia Department of Conservation & Recreation

INFORMATION SERVICES ORDER FORM
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INFORMATION SERVICES ORDER FORM

DCR maintains lists of natural heritage resources monitored by the Natural Heritage Program. These lists provide information on taxonomy, rarity and federal/state legal statuses. These reports are not site specific and are **NOT** to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

Due to staff and budget constraints we ask that you use the online service whenever possible to download these lists of natural heritage resources:

Hyperlink to on-line reports (these may change as they are updated by inventory staff)

The Natural Communities of Virginia, 2nd Approximation

☐ **Natural Heritage Resources of Virginia: Rare Animals (PDF)**

☐ **Natural Heritage Resources of Virginia: Rare Plants (PDF)**

County lists of natural heritage resources can be generated using the Internet Database Search Tool:

Or requested below :

Send data and invoice (if applicable) to: (Please be sure to include a phone number and e-mail so we may contact you if we have any questions regarding your data needs)

Name: Janet C. O'Neill

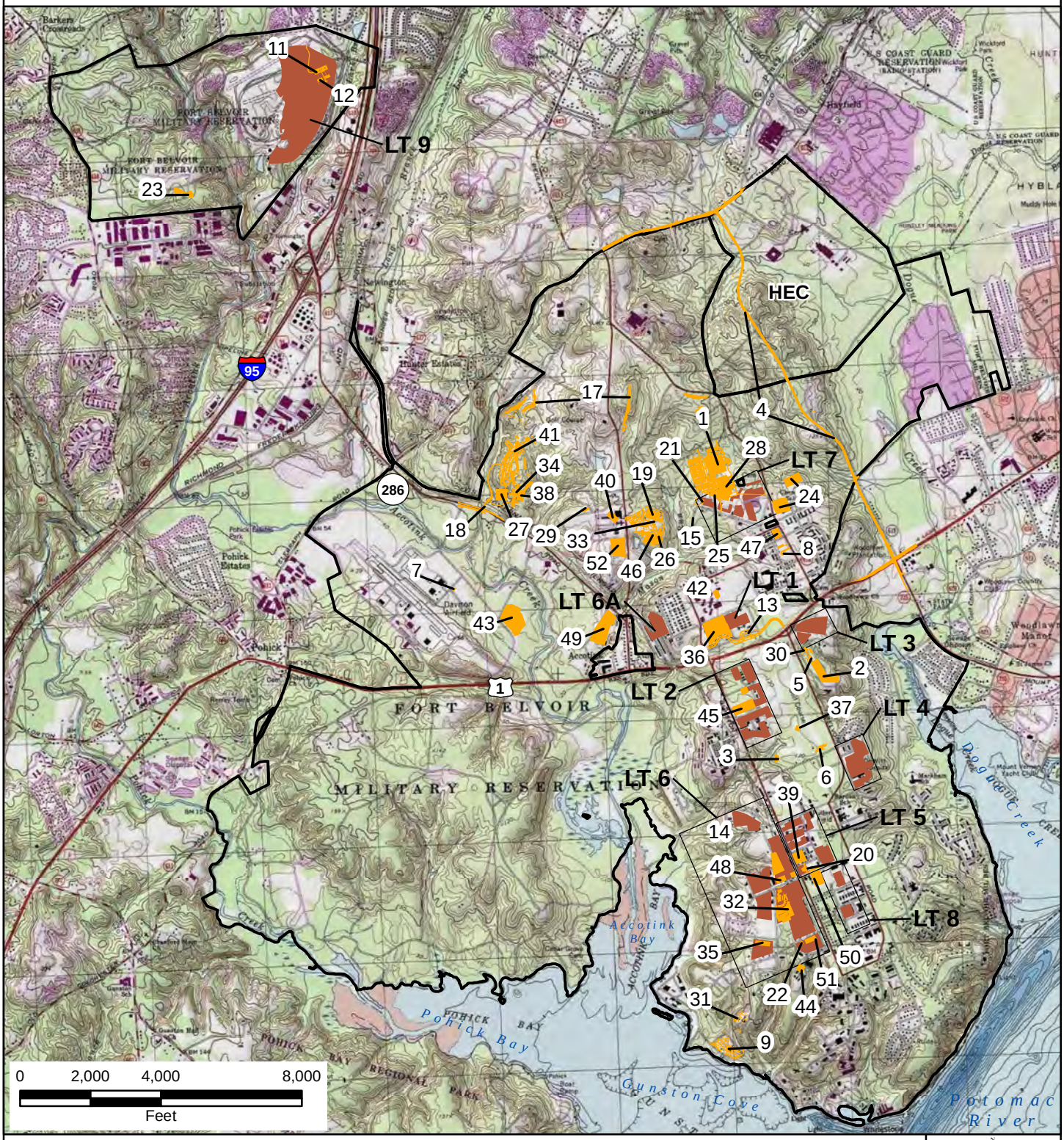
Company: Carter's Run Environmental Corporation

Address: 7137 Wilson Road **City:** Marshall

State/Zip: VA 20115 **Phone:** 540-219-0322 **Fax:**

Email: janet1118@verizon.net **Taxpayer ID #:** 27-0783960

Fort Belvoir - Proposed Projects



Legend

- Short-Term Project Sites (Construction FY 2012 - 2017)
- Long-Term Project Sites (Construction FY 2018 - 2030)

Fort Belvoir RPMP EIS

L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Fort_Belvoir_USGS_Project_Map.mxd

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804) 786-6124

August 16, 2013

Janet C. O'Neill
Carter's Run Environmental Corporation
7137 Wilson Road
Marshall, VA 20115

Re: 11120, Fort Belvoir Real Property Master Plan-Main Post and North Area

Dear Ms. O'Neill:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Sites # 2, 3, , 5, 6, 9, 13, 20, 24, 30, 37, 39, 50 & LT 3, 4, 5, 8

Biotics documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

Sites #1, 7, 8, 11, 12, 15, 17, 18, 19, 21, 25 - 29, 33, 34, 36, 38, 40 - 43, 45 - 47, 49, 52 & LT 1, 2, 6A, 7

According to the information currently in our files, the Accotink Wetlands Conservation Site is located downstream from the project sites. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Accotink Wetlands Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

	Tidal Freshwater Marsh (Mixed High Marsh Type)	G3/S4?/NL/NL
Bolboschoenus fluviatilis	River bulrush	G5/S2/NL/NL
Lathyrus palustris	Marsh pea	G3/S1/NL/NL

Ranunculus ambigens	Water-plantain crowfoot	G4/S1/NL/NL
Glyptemys insculpta	Wood turtle	G3/S2/NL/LT

Site #4

According to the information currently in our files, the Dogue Creek Wetlands Conservation Site is located downstream from the project sites. Dogue Creek Wetlands Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general significance. The natural heritage resource of concern at this site is:

Glyptemys insculpta	Wood turtle	G3/S2/NL/LT

The Wood turtle (*Glyptemys insculpta*, G3/S2/NL/LT) ranges from southeastern Canada, south to the Great Lake states and New England. In Virginia, it is known from northern counties within the Potomac River drainage (NatureServe, 2009). The Wood turtle inhabits areas with clear streams with adjacent forested floodplains and nearby fields, wet meadows, and farmlands (Buhlmann et al., 2008; Mitchell, 1994). Since this species overwinters on the bottoms of creeks and streams, a primary habitat requirement is the presence of water (Mitchell, 1994).

Threats to the wood turtle include habitat fragmentation, urbanization, and automobile or farm machinery mortality (Buhlmann et al., 2008). Please note that the Wood turtle is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

In addition, Dogue Creek has been designated by the VDGIF as a "Threatened and Endangered Species Water" for this species.

Sites # 22, 31, 32, 44, 51

According to the information currently in our files, this site is located within the –Area T-17 Ravines Conservation Site that has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resource of concern at this site is:

NorthernVirginia Well Amphipod	*Sygobromus phreaticus*	G1/S1/SOC/NL

The Northern Virginia Well amphipod, is a distinctive species of subterranean amphipod that has a very limited range (Holsinger, 1991). Amphipods are tiny crustaceans more commonly known as freshwater shrimp, scuds, or sideswimmers. Their common names arise from their resemblance to shrimp and their habit of swimming or "scudding" along the substrate on their sides in an undulating motion (Pennak, 1978). Amphipods are common in freshwater ecosystems of Virginia; they also occur in brackish and marine waters along the coast. Unable to swim in open water, amphipods are confined to the substrate--the stones, wet leaves and aquatic vegetation of their freshwater habitats--where they feed on detritus (dead animal and plant matter).

The Northern Virginia Well amphipod has been documented at only three sites, including historical collections obtained from wells in Alexandria (1921) and Vienna (1948) in northern Virginia (suburbs of Washington, D.C.). The exact locations of both collection sites are unknown, but they are presumed to have been destroyed by subsequent urbanization (Holsinger, 1991). The only recent collections (1996 and 2003) are from a single ravine seepage habitat on a military base in Fairfax County, Virginia (Chazal and Hobson, 2003).

Threats to the Northern Virginia Well amphipod are pollution of the groundwater, disturbance of the groundwater recharge area (such as urbanization) and disturbance of aquatic habitats. Please note that this species is tracked as a species of concern by the United States Fish and Wildlife Service (USFWS); however, this designation does not have any official legal status.

Sites #11, 12, 23

According to the information currently in our files, the Fort Belvoir Proving Ground Conservation Site is located within the project sites. Fort Belvoir Proving Ground Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resource of concern at this site is:

Isotria medeoloides	Small whorled pogonia	G2/S2/LT/LE

Small whorled pogonia, a perennial orchid, grows in a variety of woodland habitats in Virginia, but tends to favor mid-aged woodland habitats on gently north or northeast facing slopes often within small draws. It is quite natural for plants of this species to remain dormant in the soil for long periods of time. Direct destruction, as well as habitat loss and alteration, are principle reasons for the species' decline (Ware, 1991). The Virginia Field Office of the U.S. Fish and Wildlife Service recommends that field surveys for this species be conducted in areas of Virginia south of Caroline County from May 25 through July 15 and in areas of Virginia from Caroline County and north from June 1 through July 20 (K. Mayne, pers. com. 1999). Please note that this species is currently classified as threatened by the United States Fish and Wildlife Service (USFWS) and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

Due to the potential for these sites to support populations of small whorled pogonia, DCR recommends an inventory for the resource in the study area prior to any forest clearing. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at chris.ludwig@dcr.virginia.gov or 804-371-6206 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. Survey results should be coordinated with DCR-DNH and USFWS. Upon review of the results, if it is determined the species is present, and there is a likelihood of a negative impact on the species, DCR-DNH will recommend coordination with VDACS to ensure compliance with Virginia's Endangered Plant and Insect Species Act.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations. In the areas within or adjacent to the Area T-17 Ravines, avoid disturbing any seeps or springs. Due to the legal status of Wood turtle, DCR also recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

In addition, DCR also recommends a re-review when site specific plans become available, prior to any land disturbing activity.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $240.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, **DCR - Division of Natural Heritage, 600 East Main Street, 24th Floor, Richmond, VA 23219.** Payment is due within thirty days of the invoice date. Please note the change of address for remittance of payment as of July 1, 2013. Late payment may result in the suspension of project review service for future projects.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). **For Sites 2, 4, 5, 13, 24, 30** Dogue Creek and Unnamed Tributary to Dogue Creek , which have been designated by the Virginia Department of Game and Inland Fisheries (VDGIF) as a "Threatened and Endangered Species Water", are downstream of the project sites. The species associated with these T & E Waters is the Wood turtle.

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc: Amy Ewing, VDGIF
Troy Andersen, USFWS

Literature Cited

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Literature Cited

Chazal, A.C. and C. S. Hobson. 2003. Surveys for the Northern Virginia Well Amphipod (*Stygobromus phreaticus*) at Fort Belvoir, Virginia. Natural Heritage Technical Report 03-11. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. Unpublished report submitted to USAG Fort Belvoir. 11 pp plus appendix.

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Ware, D.M.E. 1991. Small whorled pogonia. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia.

Accounts Payable

COMMONWEALTH OF VIRGINIA
Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, 24th Floor
Richmond, VA 23219

Make checks payable to the
TREASURER OF VIRGINIA

NOTICE new address to left

PLEASE include "Division of Natural Heritage" in the address when mailing payment.

Fed I.D. # 54-6004497
DUNS # 8097 44444

Payment is due 30 days after receipt or invoice

INVOICE

Invoice Number: **H- 10389**

Invoice Date: August 16, 2013

Janet C. O'Neill
Carter's Run Environmental Corporation
7137 Wilson Road
Marshall, VA 20115

Please return remittance copy with payment to ensure proper credit to your invoice.

Taxpayer I.D.# 27-0783960

Contact: Rene' Hypes
Division of Natural Heritage
(804) 371-2671 FAX# (804) 371-2674 TDD (804) 786-2121

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT
Impact Review by Quad	2	EA	90.00	180.00
Element Occurrences	6+	AT	60.00	60.00
Site Reference 11120, Fort Belvoir Real Property Master Plan				

Credit Information:
199 0200 14 50317 02199 73201 304

Amount Due: **$240.00**

The Department of Conservation and Recreation may charge interest on all past due accounts receivable in accordance with guidelines promulgated by the Department of accounts and at the underpayment rate prescribed in Section 58.1-15 of the Code of Virginia. Each past due account receivable may also be charge an additional mount which shall approximate the administrative cost incurred in collecting the past due amount. The Department may also assess late payment penalty fees as appropriate.

From: Janet O'Neill
Carter's Run Environmental Corporation
7137 Wilson Road, Marshall, VA 20115-2020
Email: janet1118@verizon.net
Telephone: 540-219-0322

To: U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061

October 21, 2013

Re: Online Project Review Request, Fort Belvoir Real Property Master Plan (RPMP), Fairfax County, Virginia

We have reviewed the referenced project using the Virginia Field Office's online project review process and have followed all guidance and instructions in completing the review. We completed our review on October 18, 2013, and are submitting our project review package in accordance with the instructions for further review.

The United States (U.S.) Army Garrison Fort Belvoir is in the process of developing a new RPMP for Fort Belvoir's Main Post and the Fort Belvoir North Area. They are also preparing an EIS to address adoption of the RPMP and implementation of the plan's proposed short-term (2012 – 2017) development projects. These include 52 site development and seven transportation improvement projects. The EIS will also, to the extent that we have information, address ten long-term (2018 – 2030) development and ten long-term transportation improvement projects.

Most projects addressed by the new RPMP would be located in the central, upland portion of the Main Post, and many would be located on previously-developed and previously disturbed areas. The 52 short-term projects include site developments covering a wide range of uses (professional/medical/institutional buildings, elementary schools, parking garages, the new Post Exchange and Commissary, and facilities for other support services). The seven short-term transportation projects including intersection improvements, transit hubs, new access control points, and roadway improvements. Some projects, such as the Fort Belvoir Travel Camp, the National Museum of the Army, and the Richmond Highway-Telegraph Road Connector (Mulligan Road) have already been evaluated through the NEPA process, but will be included in this EIS as well to provide the full picture of the RPMP's impacts.

The ten long-term development "projects" are really potential suitable sites for development or redevelopment in the future. The ten long-term transportation projects are largely road and intersection improvements. While the RPMP EIS will be the only NEPA document prepared for the short-term projects, additional NEPA documentation will be prepared for the long-term projects as more specific design information becomes available.

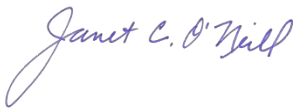
None of the short or long-term projects involve direct impacts to Accotink Creek, Pohick Creek, Dogue Creek, Accotink Bay, Pohick Bay, Gunston Cove, or the Potomac River. The thrust of the RPMP is to reserve large tracts of buildable areas for future campuses and/or phased infill type development. These buildable areas have been configured to the extent feasible to avoid ecologically sensitive areas.

The location of the project and the action area are identified on the enclosed USGS map. The Short range projects are expected to be completed by 2017, while the long range projects could extend as long as 2030.

This project review is needed for adoption of the RPMP and EIS Record of Decision. The enclosed project review package provides the information about the species, critical habitat, and bald eagles considered in our review, and the species conclusions table included in the package identifies our determinations for the resources that may be affected by the project.

For additional information, please contact me at the address listed above.

Sincerely,



Janet O'Neill
Carter's Run Environmental Corporation

Enclosures:

1) USFWS Project Review Package (IPaC)
2) USGS Map
3) Species Conclusion Table
4) Virginia Department of Conservation and Recreation National Heritage Program (VDCR-NHP Review Response)
5) Sensitive Joint Vetch Survey Report (VDCR-NHP)
6) Small Whorled Pogonia Survey Report (VDCR-NHP)(most recent)
7) Virginia Department of Game and Inland Fisheries response

7137 Wilson Road, Marshall, VA 20115
540-349-3263
540-219-0322
Janet1118@verizon.net

8) VA Fish and Wildlife Information System database search
9) Bald Eagle Nest Locator Website Data

Cc: Marc Russell, Fort Belvoir ENRD
Penny Douglas, AECOM

7137 Wilson Road, Marshall, VA 20115
540-349-3263
540-219-0322
Janet1118@verizon.net

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE
6669 SHORT LANE
GLOUCESTER, VA 23061
(804) 693-6694
http://www.fws.gov/northeast/virginiafield/

CHESAPEAKE BAY ECOLOGICAL SERVICES FIELD OFFICE
177 ADMIRAL COCHRANE DRIVE
ANNAPOLIS, MD 21401
(410) 573-4500

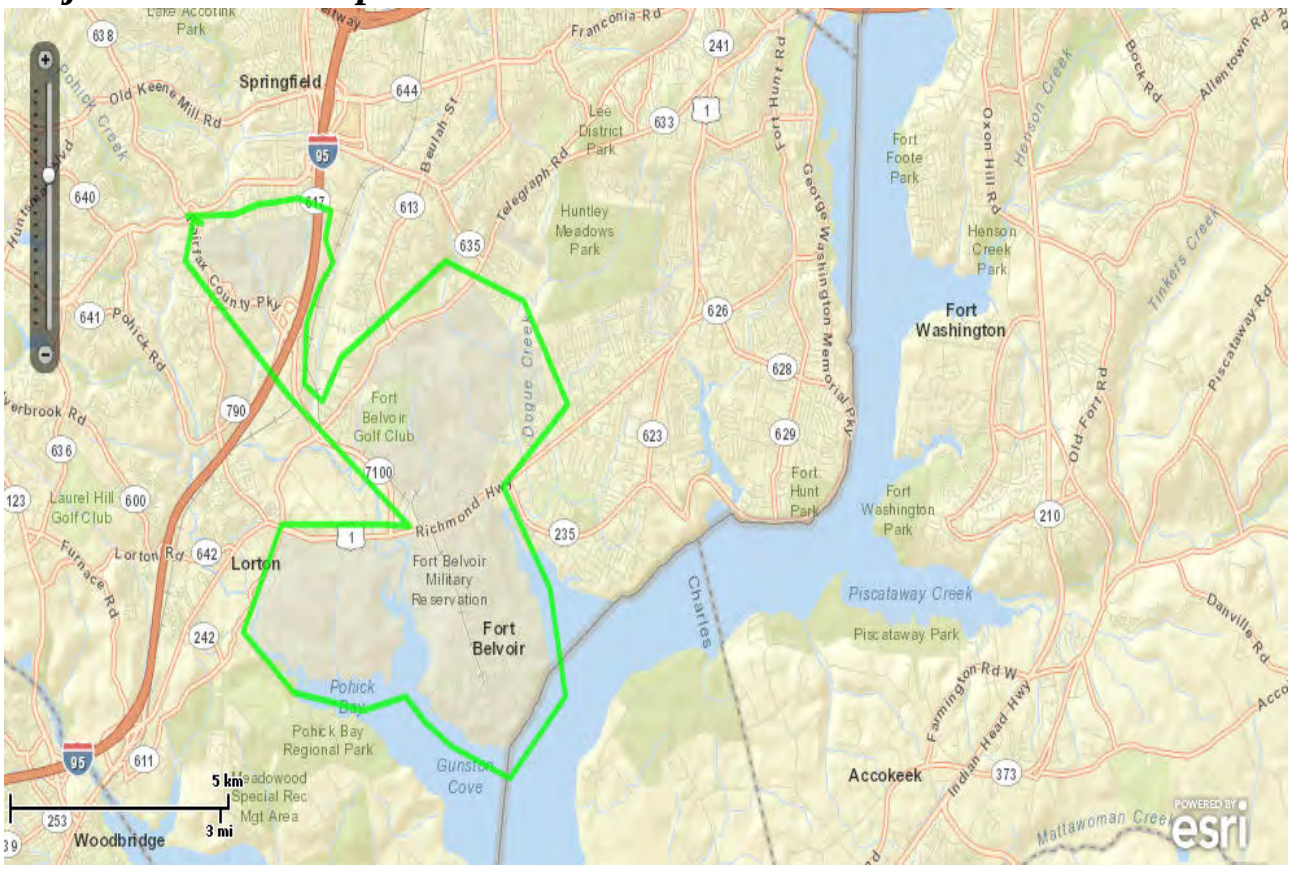
Project Name:

Fort Belvoir MP

U.S. Fish and Wildlife Service

Natural Resources of Concern

Project Location Map:



Project Counties:

Charles, MD | Fairfax, VA

U.S. Fish and Wildlife Service

Natural Resources of Concern

Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):

MULTIPOLYGON (((-77.2051815 38.7592341, -77.1990555 38.7608665, -77.1990519 38.7608671, -77.1940015 38.7612467, -77.1883753 38.761871, -77.1883686 38.7618706, -77.1796997 38.7598895, -77.1796922 38.759886, -77.1796868 38.7598798, -77.1796843 38.759872, -77.1796852 38.7598638, -77.1811931 38.7552673, -77.179103 38.7515131, -77.1791006 38.7515051, -77.1791016 38.7514967, -77.1791061 38.7514896, -77.1822118 38.7482511, -77.1839614 38.7455354, -77.1861046 38.7417778, -77.1866358 38.7320331, -77.1819757 38.7292101, -77.1770435 38.7362328, -77.1770368 38.7362388, -77.1492448 38.7517296, -77.1492372 38.751732, -77.1492292 38.7517312, -77.1286655 38.7453482, -77.1286596 38.7453453, -77.128655 38.7453406, -77.1169648 38.7287235, -77.1169617 38.7287166, -77.1169614 38.728709, -77.116964 38.7287018, -77.1169691 38.7286961, -77.1341365 38.7155967, -77.1216871 38.6991921, -77.1216835 38.6991846, -77.1175361 38.6818306, -77.1175358 38.6818235, -77.1175379 38.6818167, -77.1175423 38.6818111, -77.1323498 38.6685863, -77.1323557 38.6685826, -77.1323626 38.6685812, -77.1323695 38.6685822, -77.1478009 38.6737798, -77.1478043 38.6737813, -77.1544647 38.6775069, -77.1544673 38.6775087, -77.1598845 38.6817645, -77.1711365 38.679515, -77.1711435 38.6795148, -77.1895456 38.6824361, -77.1895542 38.6824397, -77.2029095 38.6921274, -77.2029146 38.6921327, -77.2029174 38.6921395, -77.2029175 38.6921468, -77.2029151 38.6921537, -77.1928042 38.7094222, -77.1927997 38.7094275, -77.1927937 38.7094309, -77.1927869 38.7094321, -77.1654069 38.7094589, -77.1654061 38.7094589, -77.1589554 38.709194, -77.1907662 38.7300285, -77.1907676 38.7300295, -77.218291 38.7517396, -77.2182962 38.7517458, -77.2182985 38.7517535, -77.2182976 38.7517615, -77.2162205 38.7581737, -77.2162173 38.7581798, -77.2162122 38.7581844, -77.2162058 38.758187, -77.2161989 38.7581873, -77.2140405 38.757901, -77.2158661 38.7586845, -77.2158725 38.7586889, -77.2158768 38.7586955, -77.2158782 38.7587032, -77.2158766 38.7587108, -77.2158722 38.7587172, -77.2158656 38.7587215, -77.2158579 38.7587229, -77.2158503 38.7587213, -77.2138912 38.7578805, -77.2138845 38.7578758, -77.2138803 38.7578689, -77.2138791 38.7578608, -77.2138813 38.757853, -77.2138864 38.7578466, -77.2138936 38.7578429, -77.2139017 38.7578423, -77.2161876 38.7581455, -77.2182553 38.7517624, -77.1907435 38.7300614, -77.1588728 38.7091877, -77.1588675 38.7091826, -77.1588644 38.7091759, -77.158864 38.7091685, -77.1588662 38.7091615, -77.1588709 38.7091557, -77.1588773 38.7091521, -77.1588846 38.709151, -77.1654073 38.7094189, -77.1927754 38.7093921, -77.2028714 38.6921491, -77.1895346 38.6824749, -77.1711408 38.6795549, -77.1598833 38.6818055, -77.1598748 38.6818054, -77.159867 38.6818016, -77.1544438 38.6775411, -77.1477864 38.6738172, -77.1323677 38.6686239, -77.1175778 38.681833, -77.1217215 38.6991713, -77.1341804 38.7155884, -77.1341838 38.7155954, -77.1341843 38.7156032, -77.1341818 38.7156106, -77.1341766 38.7156164, -77.1170086 38.7287162, -77.1286838 38.745312, -77.1492328 38.7516905, -77.1770134 38.7362061, -77.1819537 38.7291718, -77.1819591 38.7291666, -77.181966 38.7291637, -77.1819735 38.7291636, -77.1819805 38.7291662, -77.1866668 38.7320051, -77.1866721 38.7320098, -77.1866755 38.7320162, -77.1866764 38.7320233, -77.1861443 38.7417847, -77.1861417 38.7417935, -77.1839959 38.7455557, -77.1839953 38.7455566, -77.1822444 38.7482744, -77.182242 38.7482774, -77.1791452 38.7515066, -77.1812323 38.7552555, -77.1812347 38.7552633, -77.1812338 38.7552714, -77.17973 38.7598554, -77.1883743 38.7618308, -77.1939974 38.7612069, -77.1939981 38.7612069, -77.199047 38.7608274, -77.2051736 38.7591948, -77.2051783 38.7591941, -77.2182782 38.758964, -77.2182859 38.7589654, -77.2182925 38.7589696, -77.2182969 38.758976, -77.2182986 38.7589836, -77.2182972 38.7589913, -77.218293 38.7589979, -77.2182866 38.7590023, -77.218279 38.759004, -77.2051815 38.7592341)))

U.S. Fish and Wildlife Service

Natural Resources of Concern

Project Type:

Development

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **2** threatened, endangered, or candidate species, and/or designated critical habitat on your species list. Species on this list are the species that may be affected by your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Please contact the designated FWS office if you have questions.

Species that may be affected by your project:

Flowering Plants	Status	Species Profile		Contact
Sensitive joint-vetch (*Aeschynomene virginica*)	Threatened	species info		Virginia Ecological Services Field Office
Small Whorled pogonia (*Isotria medeoloides*)	Threatened	species info		Virginia Ecological Services Field Office

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

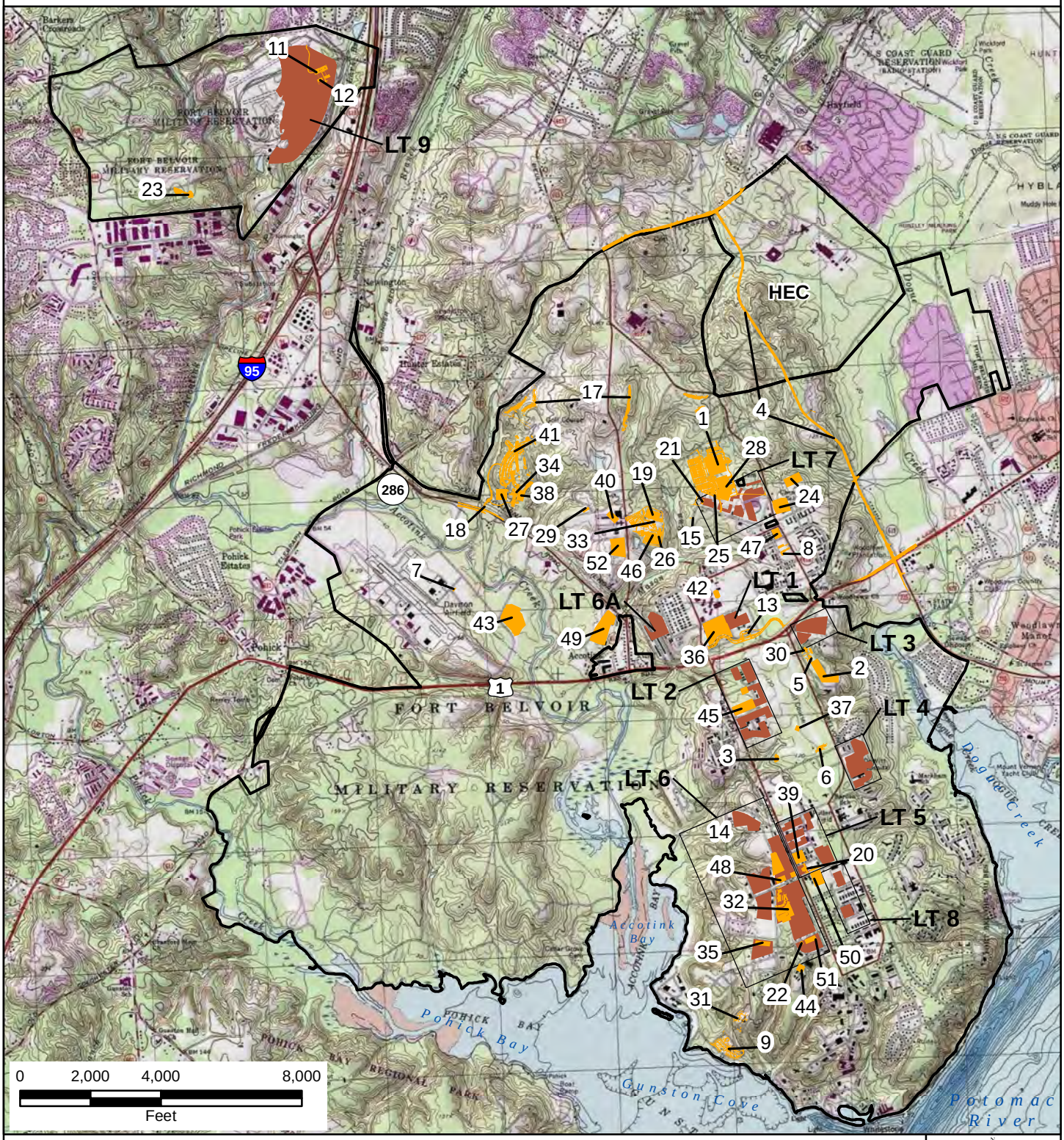
U.S. Fish and Wildlife Service

Natural Resources of Concern

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

Fort Belvoir - Proposed Projects



Legend

- Short-Term Project Sites (Construction FY 2012 - 2017)
- Long-Term Project Sites (Construction FY 2018 - 2030)

Fort Belvoir RPMP EIS

L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Fort_Belvoir_USGS_Project_Map.mxd

Species Conclusions Table

Project Name: Fort Belvoir Real Property Master Plan

Date: October 17, 2013

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
Small whorled pogonia (*Isotria medeoloides*)	Species present	No effect	Fort Belvoir has conducted and will continue to conduct surveys for the small whorled pogonia on a project-by-project basis where there is potential habitat. To date, no plants have been found on the Main Post, but it has been observed on steep, oak-dominated forested slopes on a first order tributary of Accotink Creek in the southwestern part of the Fort Belvoir North Area (FBNA). This is the only location in Fairfax County where the species has been found. Potential habitat for the small whorled pogonia can be found along the western and southern boundaries of the FBNA (WSSI, 2005a; 2006). However, Fort Belvoir does not propose to allow any development to occur in these areas. The only potential future development area identified on the FBNA is east of the new NGA facility. See also letter dated August 16, 2013 from Alli Baird of the Virginia Department of Conservation and Recreation (VDCR) Natural Heritage Program. The most recent small whorled pogonia survey was conducted by VDCR-Natural Heritage Program staff, who surveyed proposed sites of new or updated water and sewer lines mostly on the portion of Fort Belvoir south of US 1 (two survey areas bordered US 1 on its north side) during the 2011 and 2012 survey seasons. The survey was conducted in areas of high and medium potential habitat. No individuals were found (letter dated July 16, 2012 from Nancy Van Alstine, VDCR-NHP, to Sybille Vega, Fort Belvoir ENRD).
Sensitive joint-vetch (*Aeschynomene virginica*)	Species potentially present	No effect	The species shows up on the USFWS Official Species List, but has not yet been found on Fort Belvoir. VDCR-NHP did not identify sensitive joint vetch in its database search (letter dated August 16, 2013 from Alli Baird of the VDCR Natural Heritage Program). The VDCR-NHP surveyed suitable habitats on the post – the fresh tidal marsh habitat of the lower Pohick Creek, Accotink Creek, and Dogue Creek drainages – for sensitive joint-vetch (*Aeschynomene virginica*) during the 2011- 2012 field seasons, but none was found (Van Alstine, April 2013b). The thrust of the Real Property Master Plan is to reserve large tracts of buildable areas for future campuses and/or phased infill type development. These buildable areas have been configured to the extent feasible to avoid of the ecologically sensitive areas. None of the projects envisioned in the Real Property Master Plan would impact any freshwater or slightly brackish tidal habitat where

			sensitive joint vetch is usually found.
Bald eagle	Species present. Unlikely to disturb nesting bald eagles. Does intersect with eagle concentration area.	Eagle Act permit may be required.	We have been unable to access the Center for Conservation Biology Eagle Nest Locator. However, based on information obtained from that site in July 2013, and on information provided by John Pilciki of the Fort Belvoir ENRD, there are four active nests on Fort Belvoir, all on South Post. Two are located within the Southwest Area, one along the Dogue Creek shoreline, and one on the Potomac River shoreline near the mouth of Dogue Creek. Everyone of these nests fledged at least one chick during the 2013 season (Pilcicki, September 2013). There is also a nest across Gunston Cove on Mason Neck (Center for Conservation Biology Eagle Nest Locator Website, July 2013). Accotink Bay Wildlife Refuge is a high-use foraging area with the greatest eagle activity occurring during the winter. Bald eagles also forage within the Jackson Miles Abbott Wetland Refuge. The Belvoir shoreline is part of the Mason Neck Eagle Concentration Area. The only project with a potential to impact bald eagle habitat would be Phase 1 of the Family Travel Camp. An existing parking lot near along the Gunston Cove shoreline would be upgraded to provide parking for RVs. The parking lot underlies the eagle foraging habitat associated with the Mason Neck Eagle Concentration Area. The impact would be minor although long-term; the use of this site, which once housed buildings and a parking lot, for RV parking represents an increase in human activities in this area, but is unlikely to interfere with eagle foraging offshore. None of the short (or long)-term projects are within the strictest recommended limits under the Virginia bald eagle guidelines, namely within 1,320 feet of the nests in the Southwest Area, the Potomac and Dogue Creek shorelines, or the nest across Gunston Cove on Mason Neck.

Surveys for Sensitive Joint-Vetch (*Aeschynomene virginica* (L.) B.S.P.) in 2011-2012 at U.S. Army Garrison Fort Belvoir, Virginia

FINAL REPORT

Natural Heritage Technical Report 13-06

April 2013

Prepared by:

Nancy E. Van Alstine
Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, VA 23219

Submitted to:

U.S. Army Garrison Fort Belvoir
Directorate of Public Works
Environmental and Natural Resources Division
9430 Jackson Loop
Fort Belvoir, Virginia 22060

This report should be cited as:
Van Alstine, N.E. 2013. Surveys for sensitive joint-vetch (*Aeschynomene virginica* (L.) B.S.P.) in 2011-2012 at U.S. Army Garrison Fort Belvoir, Virginia. Natural Heritage Technical Report 13-06. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. Final Report. April 2013. 9 pp. plus appendix.

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ACNOWLEDGMENTS

This work was funded by U.S. Army Garrison Fort Belvoir, under the Natural Resource Survey Project, Contract # W91QV1-11-P-0250.

Within Fort Belvoir, Sybille Vega administered the project and John Pilcicki provided logistical and survey assistance for the field work. Jill Gaspar provided GIS layers useful in field planning.

Within the Virginia Department of Conservation and Recreation's Division of Natural Heritage, J. Christopher Ludwig administered the project, John Townsend conducted the resurvey of Accotink Bay/ Creek in 2012 and reviewed this report, Elizabeth Crocker managed financial affairs, Cathy Milholen compiled the existing rare species data for Fort Belvoir present in Biotics, and Faye McKinney handled logistical and administrative tasks.

SUMMARY

In 2011 and 2012, under the Natural Resource Survey Project, Contract # W91QV1-11-P-0250, surveys were conducted by the Virginia Department of Conservation and Recreation's Division of Natural Heritage for the federal and state listed plant sensitive joint-vetch (*Aeschynomene virginica*) in U.S. Army Garrison Fort Belvoir, Virginia. Sensitive joint-vetch, federally listed threatened and, in Virginia, state listed threatened, a tall annual herb in the pea family (Fabaceae), occurs in freshwater to slightly brackish wetland habitats, primarily marshes, in the intertidal zone of major coastal rivers in Virginia, Maryland, and New Jersey. Pohick Bay and lower sections of Pohick Creek, Accotink Bay and lower Accotink Creek, and lower Dogue Creek were targeted for surveys which were conducted by kayak in October 2011. Appropriate habitat was found on Accotink Bay/Creek, Pohick Bay/Creek, and to a more limited extent on lower Dogue Creek. No sensitive joint-vetch was found in 2011, but a high rainfall/flooding event in September 2011 had flattened marsh vegetation most severely in Accotink Bay/Creek where the habitat with the highest potential was present. Due to these unfavorable survey conditions in 2011, Accotink Bay/Creek was surveyed again in August 2012, mainly by kayak, but also by a foot survey that reached some marsh habitat further upstream. No sensitive joint-vetch was found at this time either.

INTRODUCTION

In 2011, U.S. Army Garrison Fort Belvoir contracted with the Virginia Department of Conservation and Recreation, Division of Natural Heritage (DCR-DNH) to conduct natural resources surveys on the Fort for threatened and endangered species during the 2011-2012 field seasons. One of those species targeted is the federal and state listed plant species sensitive joint-vetch (*Aeschynomene virginica*, G2/S2/LT/LT). This report documents the surveys conducted for sensitive joint-vetch on Fort Belvoir by DCR-DNH during the 2011-2012 field seasons.

U.S. Army Garrison Fort Belvoir is located in southeastern Fairfax County in northern Virginia, south of Washington, D.C., and bordered on the east, southeast, and east respectively by Dogue Creek, the Potomac River, and Pohick Bay (Figure 1). Most of the Fort lies east of I-95 within the Northern Coastal Plain physiographic province with the Proving Ground section, west of I-95, within the Northern Piedmont.

Sensitive joint-vetch, a tall annual herb in the pea family (Fabaceae), occurs in freshwater to slightly brackish wetland habitats, primarily marshes, in the intertidal zone of major coastal rivers in Virginia, Maryland, and New Jersey (Figure 2). It also has been found in North Carolina, in ditches and wet fields, although these are not considered stable populations (NatureServe 2013). It is known historically from Delaware and Pennsylvania. In Virginia, the plant has been documented within the Chickahominy, James, Mattaponi, Pamunkey, Rappahannock, and Potomac Rivers. The nearest population that has been documented on the Potomac River lies approximately 20 miles downstream from Fort Belvoir (Virginia Department of Conservation and Recreation 2013). Sensitive joint-vetch tends to be found near raised banks such as along channels within the marsh, but can also be found in the interior. Typical associated species include southern wild rice (*Zizania aquatica*), swamp barnyard grass (*Echinochloa walteri*), tidal-marsh amaranth (*Amaranthus cannabinus*), rice cutgrass (*Leersia oryzoides*), smooth bur-marigold (*Bidens laevis*), pickerelweed (*Pontederia cordata*), orange jewelweed (*Impatiens capensis*), smartweeds (*Persicaria* spp.), swamp rose-mallow (*Hibiscus moscheutos*), swamp milkweed (*Asclepias incarnata*), and the non-native invasive marsh dewflower (*Murdannia keisak*) (Virginia Department on Conservation and Recreation 2013). Virginia supports the majority of the extant occurrences. Plants bloom from July through September, and fruits are produced from July to October.

DCR-DNH is the state agency responsible by statutory authority under the Virginia Natural Area Preserves Act (Section 10.1-209 through 217, *Code of Virginia*) for inventory, database maintenance, protection, and management of Virginia's Natural Heritage Resources. These resources are defined as the habitats of rare, threatened, or endangered plant and animal species, rare or state significant communities, and other natural features. See Appendix 1 for an explanation of the abbreviations used to describe global and state rarity ranks of Natural Heritage Resources mentioned within this report. The Division's work represents the first comprehensive attempt to identify the Commonwealth's most significant natural areas through ongoing scientific biological survey. Data gathered during this state-wide survey are assembled and managed using a sophisticated database management system, Biotics 4, in which information on ecosystems and species, their biology, habitats, locations, conservation status, and management needs is continually updated and refined. The Division is part of an international network of biological inventories known as natural heritage programs or conservation data centers, operating in all 50 U.S. states, Canada, Latin America and the Caribbean. This network of natural heritage programs uses standardized inventory methodologies and the Biotics data management system, an advanced geographic information systems-based software tool for managing biodiversity information developed and maintained by NatureServe (www.natureserve.org).

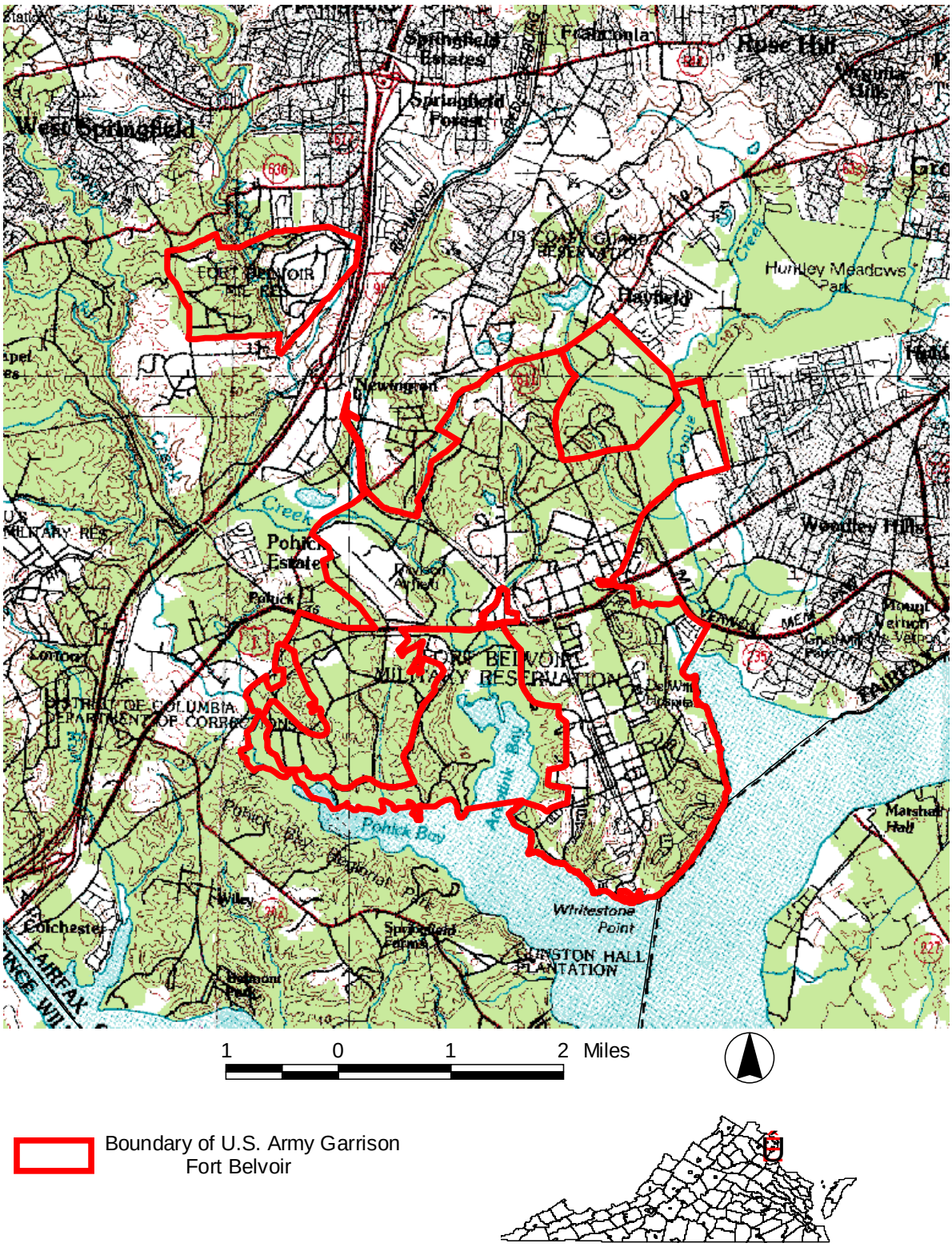

Figure 1. Location of U.S. Army Garrison Fort Belvoir, Fairfax County, Virginia. Washington West USGS 1:100, 000 quadrangle.

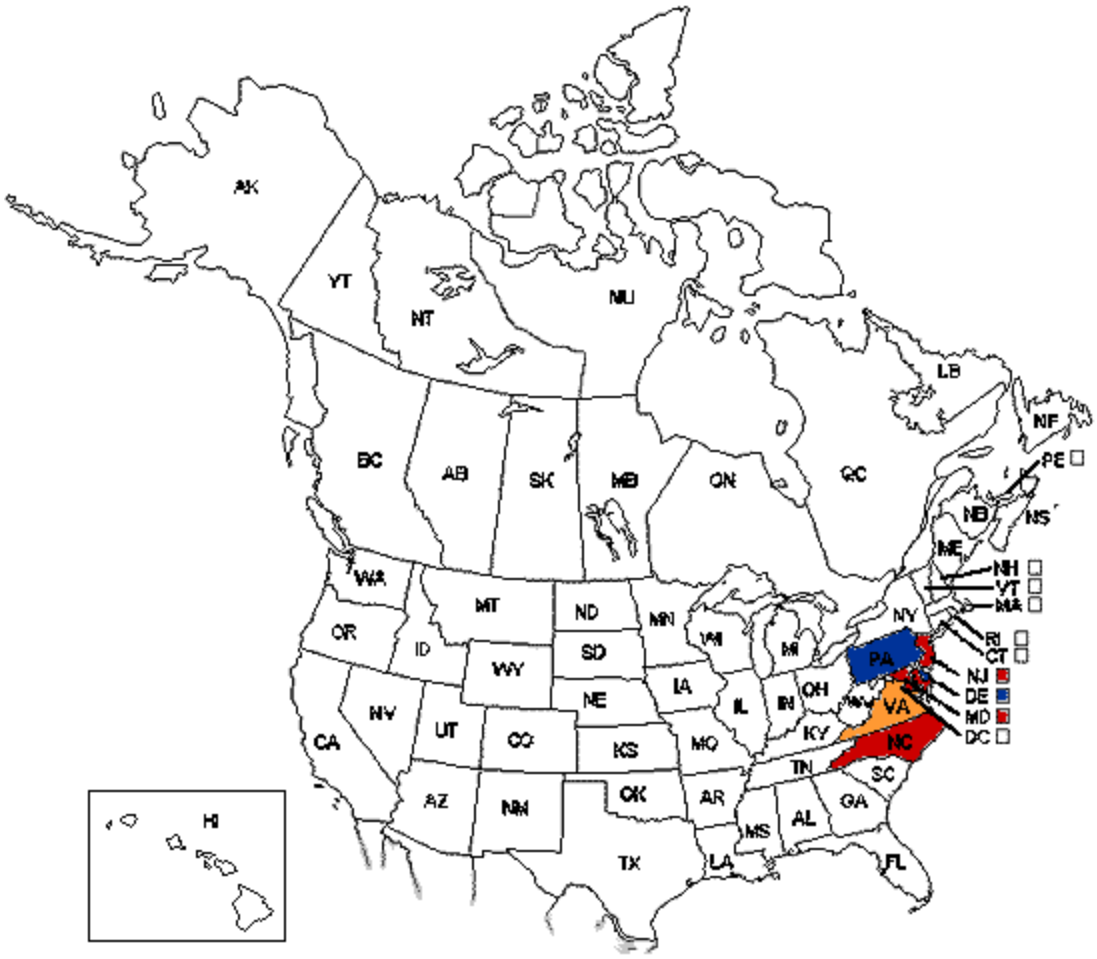

Figure 2. Global distribution of *Aeschynomene virginica*. Color indicates state/province conservation status with red = critically imperiled (S1), orange = imperiled (S2), and dark blue = presumed extirpated (SX). (See Appendix 1 for explanation of conservation status ranks.) Map and associated information was taken from NatureServe (2013).

METHODOLOGY

The scope of work for this project identified the areas known to have or likely to have appropriate habitat within Fort Belvoir as Dogue Creek, Pohick Bay, and Accotink Bay, and possibly the shoreline of the Potomac River. Previous DCR-DNH field work conducted in the tidal wetlands of Fort Belvoir by DCR-DNH was reviewed including the natural heritage inventory conducted in 1994-1995 (Hobson 1996) and the ecological community work done in 1999 by McCoy and Fleming (2000). No sensitive joint-vetch was found in that earlier work.

The optimal survey time for sensitive joint-vetch in Virginia is recommended by the U.S. Fish and Wildlife Service, Virginia Field Office, as August 15-October 15 (U. S. Fish and Wildlife Service 2013).

At this time the plant is in flower or fruit and has attained some stature making it more visible during the surveys typically conducted from a boat.

Most of the field work was conducted in October 2011 by DCR-DNH Field Botanist Nancy E. Van Alstine with assistance from John Pilcicki of Fort Belvoir. The survey was conducted by kayak and using binoculars to scan back portions of the marshes. Areas of marsh habitat along Pohick Bay, lower Pohick Creek, and Accotink Bay and lower Accotink Creek were surveyed on October 5 (Figure 3). Other parts of Accotink Creek were returned to and explored on October 11. Marshes in Dogue Creek downstream from Rt. 235 were surveyed on October 11 (Figure 4). Advice was sought from John Pilcicki on the presence of appropriate habitat along the Potomac River shoreline bordering Fort Belvoir and based on his knowledge it was determined that appropriate tidal marsh habitat does not exist there. Due to the flooding that occurred in September 2011 after an 11-inch rain event wherein some areas of marsh vegetation were flattened in Accotink Bay in the highest potential sensitive joint-vetch habitat, this area was resurveyed on August 23, 2012, by DCR-DNH Staff Botanist John Townsend, accompanied by John Pilcicki. The lower portions were surveyed by kayak in 2012, but access was gained to some more upstream marsh habitat by means of the recreational trail system in the Accotink Creek area (Figure 3).

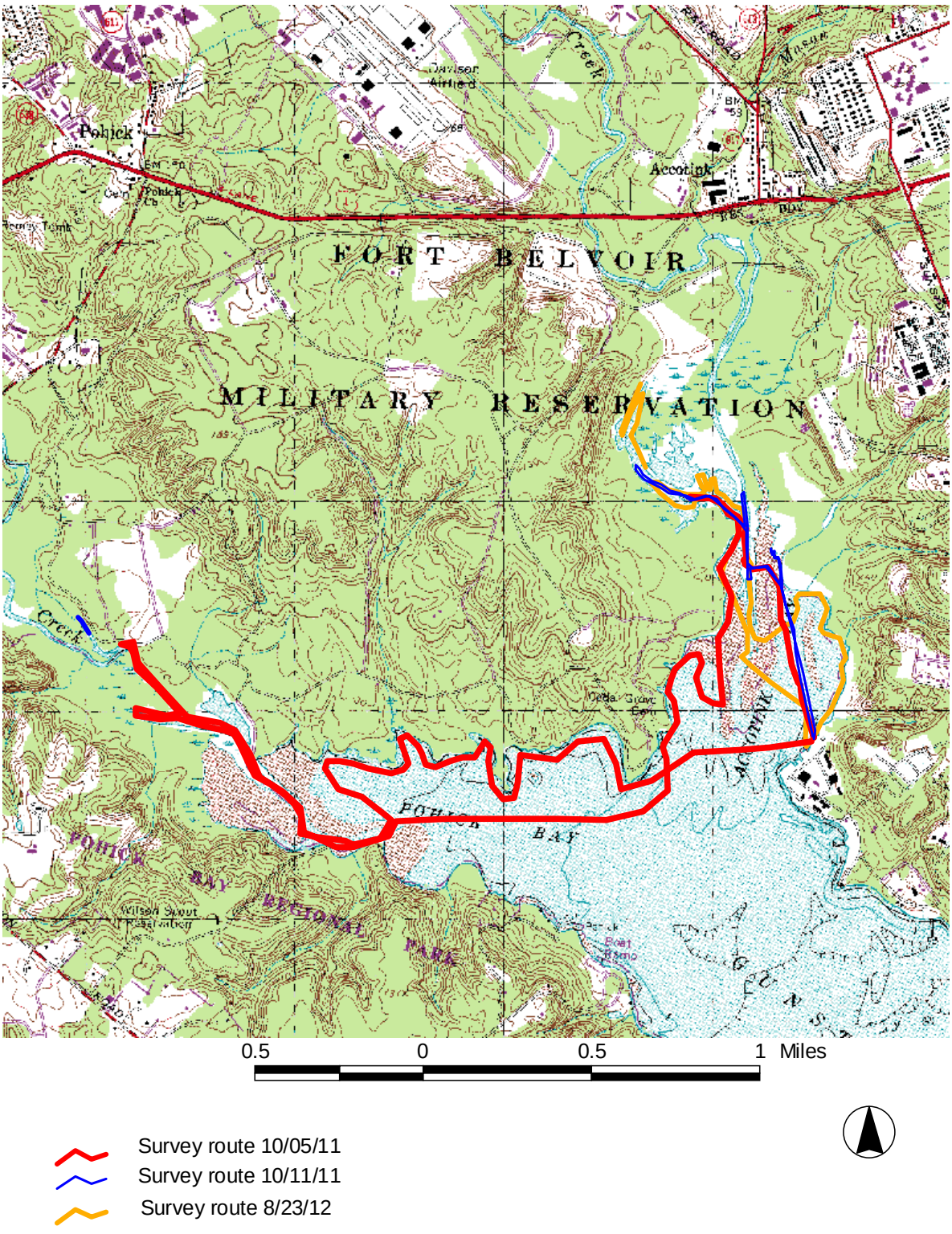

Figure 3. Survey routes for sensitive joint-vetch (*Aeschynomene virginica*) within the Pohick Creek-Accotink Creek marshes of Fort Belvoir in 2011-2012. Fort Belvoir and Mount Vernon USGS 7.5' quadrangles.

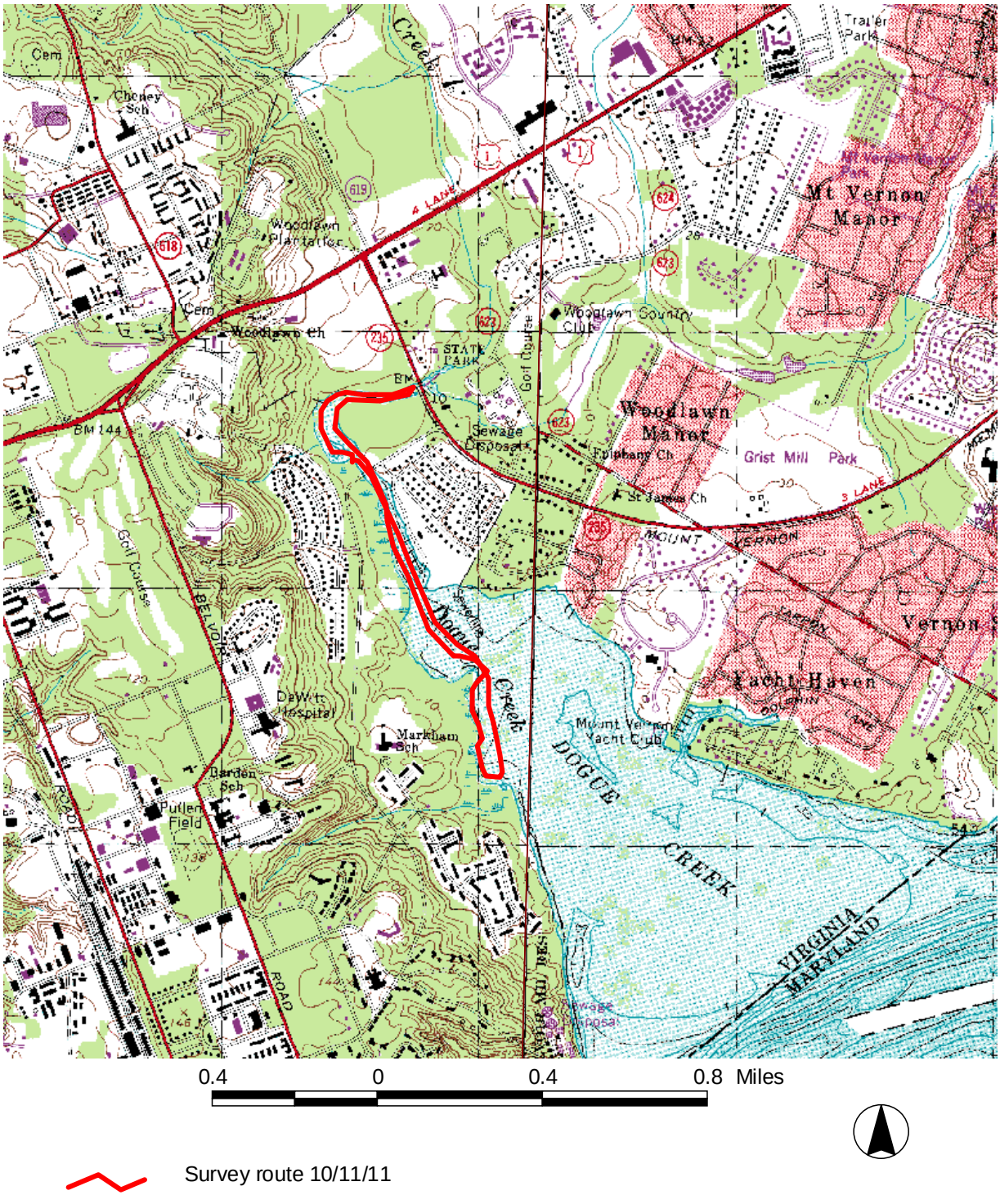

Figure 4. Survey route for sensitive joint-vetch (*Aeschynomene virginica*) within Dogue Creek downstream from Rt. 235on Fort Belvoir in 2011. Fort Belvoir and Mount Vernon USGS 7.5' quadrangles.

RESULTS

Pohick-Accotink Wetlands

This area lies within the section of Fort Belvoir designated as the Accotink Bay Wildlife Refuge, which is composed of wetlands and uplands associated with Accotink Creek and Pohick Creek, tributaries of the Potomac River on the southern part of the Fort. The portion of Fort Belvoir bordering the north side of Pohick Bay contained some narrow fringes of marsh and pocket marshes with zones or more intermixed areas of yellow cow lily (*Nuphar advena*), pickerelweed (*Pontederia cordata*), and southern wild rice (*Zizania aquatica*), smartweeds or tearthumbs (*Persicaria = Polygonum* spp.), beggar-ticks (*Bidens* spp.), and swamp rose-mallow (*Hibiscus moschuetos*). Wider areas of tidal marsh containing the preceding species lie mostly outside the boundary of Fort Belvoir within the broader Pohick Bay and these were also scanned for sensitive joint-vetch as the survey continued upstream into tidal marsh habitat within Fort Belvoir that was accessible by kayak.

An upstream area on Pohick Creek, the farthest upstream that was surveyed by kayak in 2011, and a bit farther upstream where a brief visit on foot was made in 2011, is mapped in the DCR-DNH database as supporting the state rare plant river bulrush (*Bolboschoenus fluviatilis = Schoenoplectus fluviatilis,* G5/S2/NL/NL) and tidal marsh habitat (Lea 1995); this area had been heavily impacted by the September 2011 flooding, but on the 2011 visit the floodplain, although open, looked to be at a higher elevation and not marshy. After further review of the original source material and consultation with a DCR-DNH zoologist Chris Hobson who has conducted recent zoological surveys in the upstream area, it is likely that the tidal marsh habitat observed in 1995 is further downstream, part of the area surveyed for sensitive joint-vetch by kayak in October 2011. River bulrush was not noted, but may have been overlooked if it was batten-down from the flooding.

Within Accotink Bay near its southern end, there were fringes of marsh with switchgrass (*Panicum virgatum*) and a sterile bulrush (*Bolboschoenus* sp. = *Schoenoplectus* sp.) and then zones of yellow cow lily with scattered southern wild rice behind it. Continuing upstream pocket marshes occurred characterized by southern wild rice, common cattail (*Typha latifolia*), pickerelweed, and beggar-ticks (*Bidens* sp.) and the sterile bulrush. The marsh habitat broadened out farther upstream but it also became more difficult to proceed with a kayak survey, even at high tide, due to shallow waters. The bulrush species was widespread but as it was only in a sterile form it can only be assumed that it was the river bulrush (*Bolboschoenus fluviatilis*) documented in the 1995 survey. A stretch of the highly invasive common reed (*Phragmites australis* var. *australis)* was observed on the eastern side of the marsh. The wider marsh area contained cattails, river bulrush, yellow cow lily, and smartweed species. Foot surveys were not done within the marsh in 2011 so this represents only a portion of the species present.

Other rarities that were documented in the marshes in Accotink Bay during the earlier natural heritage inventory in1995 include marsh pea (*Lathyrus palustris*) and water-plantain crowfoot (*Ranunculus ambigens*); these were not present in the areas targeted for sensitive-joint vetch surveys in 2011–2012. The narrow time frame of high tide conditions that allowed the kayak survey necessitated restricting the focus of the survey to sensitive joint-vetch rather than updating other rarities not present within the immediate survey areas.

Dogue Creek

The section of Dogue Creek downstream from the Rt. 235 (Mount Vernon Memorial Highway) bridge was kayaked in search of sensitive joint-vetch. Trees--sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), river birch (*Betula nigra*), etc.-- or yellow pond lily(*Nuphar advena*)-dominated zones line much of this lower section of Dogue Creek. A marina occupies the eastern shore south of the Mount Vernon Road bridge. Areas of appropriate fresh to slighly brackish tidal marsh habitat for sensitive joint-vetch were present but very limited. Species in the marshes included cattail (*Typha* spp.), pickerelweed

(*Pontederia cordata*), swamp rose-mallow (*Hibiscus moscheutos*), smooth bur-marigold (*Bidens* cf. *laevis*), arrow-leaf tearthumb (*Persicaria sagittata = Polygonum sagittatum*), halberd-leaf tearthumb (*Persicaria arifolia = Polygonum arifolium*) tidal-marsh amaranth (*Amaranthus cannabinus*), swamp milkweed (*Asclepias incarnata*), and young sycamore (*Platanus occidentalis*). Some of the highly invasive exotic grass common reed (*Phragmites australis* var. *australis*) was noted back near the tree line on the western side north of the Mount Vernon Road Bridge. No sensitive joint-vetch or any other plant rarities were observed.

CONCLUSION

Although the fresh tidal marsh habitat of sensitive joint-vetch occurs on Fort Belvoir within the lower Pohick Creek and Accotink Creek drainages and to a lesser extant on lower Dogue Creek, no sensitive joint-vetch was found in the 2011-2012 surveys, similar to findings in surveys by DCR-DNH and others in previous years.

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APPENDIX 1:

Definitions of Abbreviations Used on Natural Heritage Resource Lists
of the Virginia Department of Conservation and Recreation

Definitions of Abbreviations Used on Natural Heritage Resource Lists
of the
Virginia Department of Conservation and Recreation

Natural Heritage State Ranks
The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities; the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals; the quality of the occurrences, the number of protected occurrences; and threats.

S1 - Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer populations or occurrences, or very few remaining individuals (<1000).

S2 - Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 populations or occurrences or few remaining individuals (1,000 to 3,000).

S3 - Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically having 21 to 100 populations or occurrences (1,000 to 3,000 individuals).

S4 - Apparently secure; Uncommon but not rare, and usually widespread in the state. Possible cause of long-term concern. Usually having >100 populations or occurrences and more than 10,000 individuals.

S5 - Secure; Common, widespread and abundant in the state. Essentially ineradicable under present conditions, typically having considerably more than 100 populations or occurrences and more than 10,000 individuals.

S#B - Breeding status of an animal within the state

S#N - Non-breeding status of animal within the state. Usually applied to winter resident species.

S#? - Inexact or uncertain numeric rank.

SH - Possibly extirpated (Historical). Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.

S#S# - Range rank; A numeric range rank, (e.g. S2S3) is used to indicate the range of uncertainty about the exact status of the element. Ranges cannot skip more than one rank.

SU - Unrankable; Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNR - Unranked; state rank not yet assessed.

SX - Presumed extirpated from the state. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SNA - A conservation status rank is not applicable because the element is not a suitable target for conservation activities.

Natural Heritage Global Ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note GX means the element is presumed extinct throughout its range. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity. **These ranks should not be interpreted as legal designations.**

FEDERAL LEGAL STATUS
The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE - Listed Endangered
LT - Listed Threatened
PE - Proposed Endangered
PT - Proposed Threatened
C - Candidate (formerly C1 - Candidate category 1)
E(S/A) - treat as endangered because of similarity of appearance
T(S/A) - treat as threatened because of similarity of appearance
SOC - Species of Concern species that merit special concern (**not a regulatory category**)
NL – no federal legal status

STATE LEGAL STATUS
The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE - Listed Endangered
PE - Proposed Endangered
SC - Special Concern - animals that merit special concern according to VDGIF (not a regulatory category)
LT - Listed Threatened
PT - Proposed Threatened
C - Candidate
NL - no state legal status

For information on the laws pertaining to threatened or endangered species, please contact:

U.S. Fish and Wildlife Service for all **FEDERALLY** listed species;
Department of Agriculture and Consumer Services, Plant Protection Bureau for **STATE** listed plants and insects
Department of Game and Inland Fisheries for all other **STATE** listed animals

Conservation Sites Ranking

Brank is a rating of the significance of the conservation site based on presence and number of natural heritage resources; on a scale of 1-5, 1 being most significant. Sites are also coded to reflect the presence/absence of federally/state listed species:

Conservation Site Ranks
B1 – Outstanding significance
B2 – Very High significance
B3 – High significance
B4 – Moderate significance
B5 - Of general Biodiversity significance

Legal Status of Site
FL – Federally listed species present
SL – State listed species present
NL – No listed species present

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION
Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

July 16, 2012

Ms. Sybille Vega
Wetlands and Habitat Program Manager
U.S. Army Garrison Fort Belvoir
Directorate of Public Works
9430 Jackson Loop
Fort Belvoir, Virginia 22060-5116

Dear Ms. Vega:

In 2011, Fort Belvoir contracted (W91QV1-11-P-0250) with the Virginia Department on Conservation and Recreation's Division of Natural Heritage to conduct natural resources surveys on the Fort for threatened and endangered species during the 2011-2012 field seasons. One of those species targeted is the federal and state listed plant species small whorled pogonia (*Isotria medeoloides*). Fort Belvoir natural resource staff specified the areas to be surveyed based on proposed sites of new or updated water and sewer lines mostly on the portion of Fort Belvoir south of US 1; two survey areas bordered US 1 on its north side. Habitat in the designated areas had been previously mapped and evaluated as to whether it had high, medium, or low potential for small whorled pogonia. It was agreed that only those areas of high and medium potential would be surveyed for the species.

The surveys for small whorled pogonia in 2012 have now been completed. See the attached map generated by Fort Belvoir for the locations of those areas surveyed with high and medium potential. Surveys were conducted between May 22 and July 5 by me, DCR-DNH Field Botanist Nancy E. Van Alstine, with frequent assistance from Fort Belvoir Natural Resources Specialist John Pilcicki. American Water representatives accompanied us on a number of the surveys. The surveys were conducted mostly during the June 1-July 20 survey period recommended for this species in northern Virginia by the U.S. Fish and Wildlife Service, but due to the unusually mild winter and spring, it was felt that surveys could safely begin a week early. No small whorled pogonia was found in any of the survey areas. The depauperate nature of the herbaceous layer was noted in many of the areas, presumably a result of deer browse.

In addition to the sites shown on the map, several other areas requested by Fort Belvoir staff were surveyed including the known location for small whorled pogonia in north Fort Belvoir and a proposed building site north of 9th Street. No small whorled pogonia was found in either of these locations. Additional areas along Gillespie Road near Mount Vernon Road that Lenny White of American Water mentioned as possible work zones were viewed and found to have low to no potential.

If you have any questions about this survey, please contact me. A full report on this work will be completed later.

Sincerely,

Nancy

Nancy E. Van Alstine
Field Botanist
Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, VA 23219
Office (804) 371-2840
Fax (804) 371-2674
Nancy.vanalstine@dcr.virginia.gov

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Janet O'Neill

From:	JanetO'Neill <janet1118@verizon.net>
Sent:	Monday, July 22, 2013 1:58 PM
To:	ProjectReview@dgif.virginia.gov
Cc:	Penny.Douglas@aecom.com
Subject:	Project Review - Fort Belvoir Real Property Master Plan
Attachments:	Fort_Belvoir_USGS_Project_Map.pdf; Belvoir Main Post VaFWIS Map.pdf; Belvoir Main Post VaFWIS Geographic Species List.pdf; FBNA - VaFWIS Map.pdf; FBNA - VaFWIS GeographicSpecies List .pdf

Carter's Run Environmental Corporation

To Whom It May Concern:

The Army is in the process of developing a new Real Property Master Plan (RPMP) for Fort Belvoir's Main Post and the Fort Belvoir North Area (FBNA). They are also preparing an EIS to address adoption of the RPMP, and implementation of the plan's proposed short-term (2012 – 2017) development projects. The EIS will also, to the extent that we have information, address ten long-range development and ten long-range transportation improvement projects.

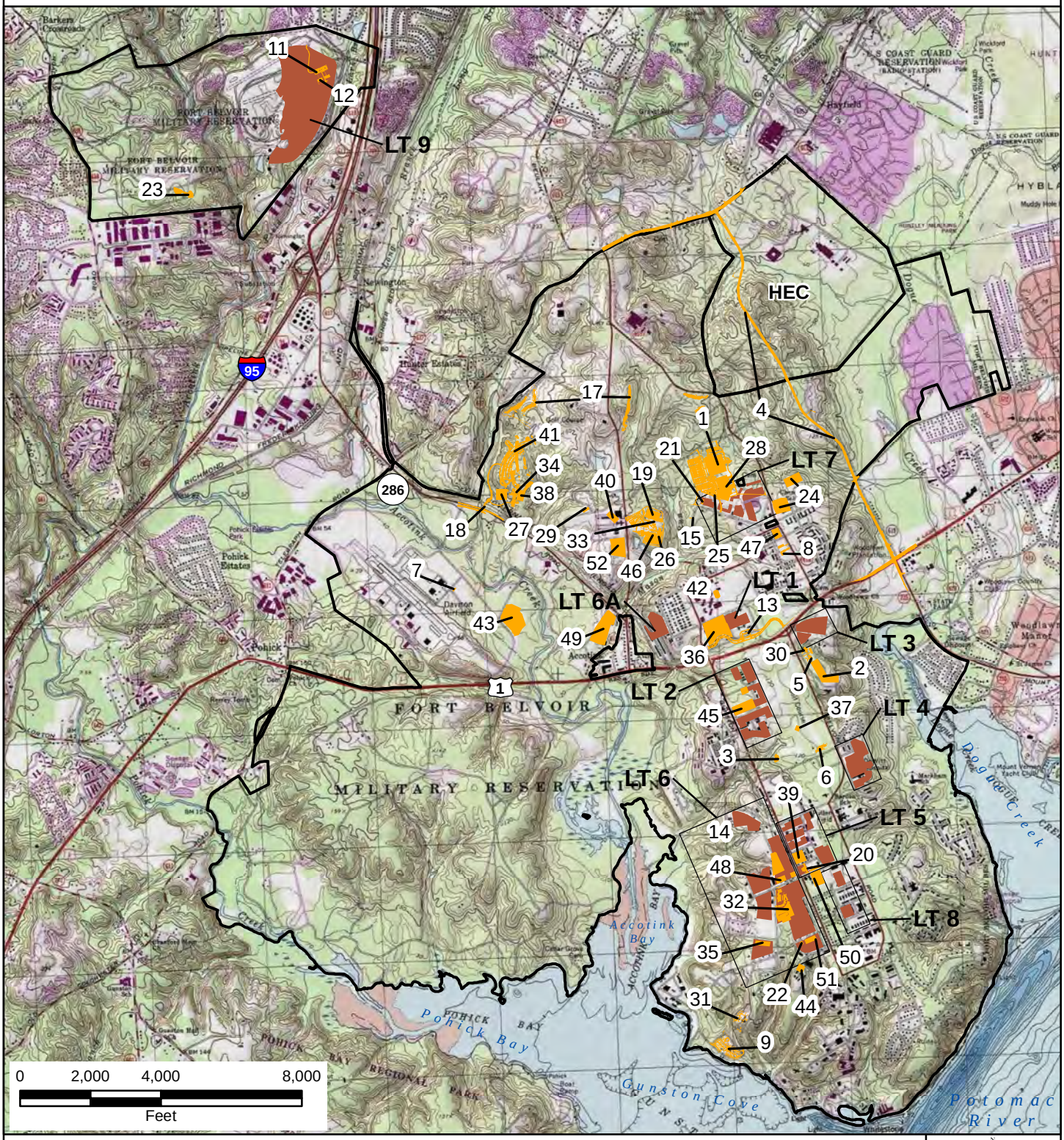
Attached is a USGS map showing the location of Fort Belvoir (Main Post and the North Area), as well as an Initial Project Assessment reports centered on both the Main Post and the FBNA from the VAFWIS. Please contact me (540-219-0322) if you need more information.

Thank-you!

Janet C. O'Neill

Carter's Run Environmental Corporation, 7137 Wilson Road, Marshall, VA 20115

Fort Belvoir - Proposed Projects



Legend

- Short-Term Project Sites (Construction FY 2012 - 2017)
- Long-Term Project Sites (Construction FY 2018 - 2030)

Fort Belvoir RPMP EIS

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VaFWIS - Department of Game and Inland Fisheries

38,42,12.4 -77,09,52.3

is the Search Point

Submit Cancel

Search Point

- ○ **Change** to "clicked" map point
- ○ **Fixed** at 38,42,12.4 -77,09,52.3

Show Position Rings

○ Yes ○ No

1 mile and 1/4 mile at the **Search Point**

Show Search Area

○ Yes ○ No

3 Search distance miles radius

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

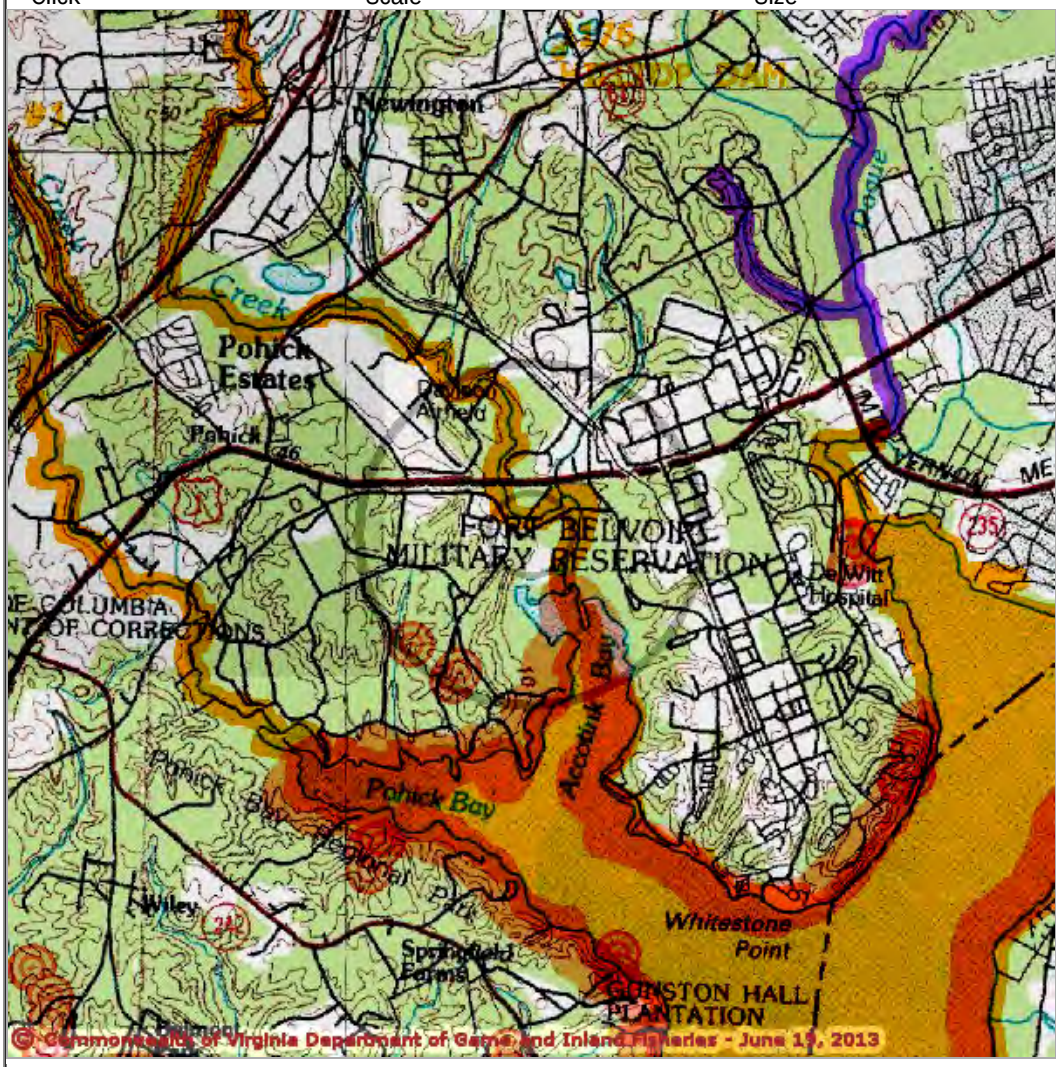
Current List: Anadromous, TEWaters, BAEANests, BECAR, Position

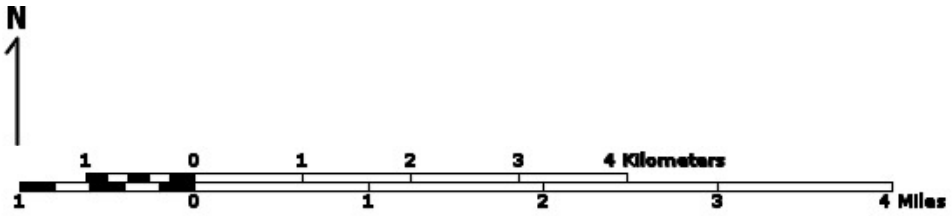
Map Overlay Legend

Virginia Fish and Wildlife Information Service

back | Refresh Browser Page

Map Click: Pan Id M | Map Scale: In Zoom Out | Screen Size: Small Size Big | Help





Point of Search 38,42,12.4 -77,09,52.3
Map Location 38,42,12.4 -77,09,52.3

Select **Coordinate System:**

- ○ Degrees,Minutes,Seconds Latitude - Longitude
- ○ Decimal Degrees Latitude - Longitude
- ○ Meters UTM NAD83 East North Zone
- ○ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for

T & E Waters

Federal

State

Anadromous Fish Reach

Confirmed

Potential

Impediment

Position Rings 1 mile and 1/4 mile at the Search Point

Bald Eagle Concentration Areas and Roosts

Bald Eagle nests 660 and 330 foot management zones

details)

Map projection is UTM Zone 18 NAD 1983 with left 306981 and top 4290894. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West.Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2013-06-19 12:25:21 (qa/qc December 5, 2012 8:04 - tn=467183 dist=4828.032 Visitor)
$poi=38.7629477 -77.1793494

| DGIF | Credits | Disclaimer | Contact shirl.dressler@dgif.virginia.gov |Please view our privacy policy |
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Visitor Options
Species Information
By Name
By Land Management
References
Geographic Search
By Map
By Coordinates
By Place Name
Help
Show This Page as Printer Friendly

VaFWIS Search Report Compiled on 6/19/2013, 12:32:18 PM

Help

Known or likely to occur within a 3 mile radius around point 38,42,12.4 -77,09,52.3 in 059 Fairfax County, VA

View Map of Site Location

571 Known or Likely Species ordered by Status Concern for Conservation (displaying first 28) (28 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus
060006	SE	II	Floater, brook	Alasmidonta varicosa
030062	ST	I	Turtle, wood	Glyptemys insculpta
040129	ST	I	Sandpiper, upland	Bartramia longicauda
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus
040379	ST	I	Sparrow, Henslow's	Ammodramus henslowii

100155	FSST	I	Skipper, Appalachian grizzled	Pyrgus wyandot
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans
070027	FS	I	Amphipod, Northern Virginia well	Stygobromus phreaticus
100248	FS	I	Fritillary, regal	Speyeria idalia idalia
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus
100154	FS	II	Butterfly, Persius duskywing	Erynnis persius persius
060029	FS	III	Lance, yellow	Elliptio lanceolata
030063	CC	III	Turtle, spotted	Clemmys guttata
030012	CC	IV	Rattlesnake, timber	Crotalus horridus
010077		I	Shiner, bridle	Notropis bifrenatus
040372		I	Crossbill, red	Loxia curvirostra
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius
040319		I	Warbler, black-throated green	Dendroica virens
040306		I	Warbler, golden-winged	Vermivora chrysoptera
040038		II	Bittern, American	Botaurus lentiginosus
040052		II	Duck, American black	Anas rubripes
040029		II	Heron, little blue	Egretta caerulea caerulea
040213		II	Owl, northern saw-whet	Aegolius acadicus
040105		II	Rail, king	Rallus elegans
040320		II	Warbler, cerulean	Dendroica cerulea
040304		II	Warbler, Swainson's	Limnothlypis swainsonii
040266		II	Wren, winter	Troglodytes troglodytes

To view All 571 species View 571

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams (4 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	

C18	Dogue creek	Confirmed	4		IV	Yes
C2	Accotink creek	Confirmed	2		IV	Yes
C62	Pohick creek	Confirmed	3		IV	Yes
C64	Potomac river	Confirmed	6		IV	Yes

Impediments to Fish Passage (1 records)

View Map of All Fish Impediments

ID	Name	River	View Map
1176	HILLTOP DAM	TR-DOGUE CREEK	Yes

Threatened and Endangered Waters (2 Reaches)

View Map of All Threatened and Endangered Waters

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Dogue Creek (02070010)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Unnamed trib. of Dogue Creek (02070010)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

are present. View Map of Bald Eagle Concentration Areas and Roosts

(6 records)

BECAR ID	Observation Year	Authority	Type	Comments	View Map
53	2006 - 2007	VDGIF, Center for Conservation Biology	Summer Concentration Area	Eagle_use High	Yes
54	2006 - 2007	VDGIF, Center for Conservation Biology	Summer Concentration Area	Eagle_use Low	Yes
55	2006 - 2007	VDGIF, Center for Conservation Biology	Summer Concentration Area	Eagle_use Moderate	Yes
56	2006 - 2007	VDGIF, Center for Conservation Biology	Winter Concentration Area	Eagle_use High	Yes

57	2006 - 2007	VDGIF, Center for Conservation Biology	Winter Concentration Area	Eagle_use Low	Yes
58	2006 - 2007	VDGIF, Center for Conservation Biology	Winter Concentration Area	Eagle_use Moderate	Yes

Bald Eagle Nests (9 records , 9 Observations with Threatened or Endangered species)

View Map of All Query Results Bald Eagle Nests

Nest	N Obs	Latest Date	N Species			View Map
			Different Species	Highest TE*	Highest Tier**	
FF0401	14	Apr 24 2011	1	FS	II	Yes
FF0501	13	Apr 24 2011	1	FS	II	Yes
FF0701	10	Apr 24 2011	1	FS	II	Yes
FF0801	8	Apr 24 2011	1	FS	II	Yes
FF0601	4	Apr 29 2007	1	FS	II	Yes
FF0402	4	May 3 2006	1	FS	II	Yes
FF0301	2	May 1 2003	1	FS	II	Yes
FF9202	18	Apr 27 2000	1	FS	II	Yes
FF9001	2	Jan 1 1991	1	FS	II	Yes

Displayed 9 Bald Eagle Nests

Habitat Predicted for Aquatic WAP Tier I & II Species (6 Reaches)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species					View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name				
Accotink Creek (20700102)		010077		I	Shiner, bridle	Notropis bifrenatus	Yes
(20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Accotink Creek (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes

Dogue Creek (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
South Run (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Unnamed trib. of Dogue Creek (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species (3 Species)

View Map of Combined Terrestrial Habitat Predicted for 3 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus	Yes
040038		II	Bittern, American	Botaurus lentiginosus	Yes
040105		II	Rail, king	Rallus elegans	Yes

Virginia Breeding Bird Atlas Blocks (6 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
53184	Fort Belvoir, CE	85	FS	II	Yes
53183	Fort Belvoir, CW	37	FS	II	Yes
53182	Fort Belvoir, NE	71		III	Yes
53181	Fort Belvoir, NW	43		IV	Yes
53186	Fort Belvoir, SE	72	FS	II	Yes
54181	Mount Vernon, NW	57		IV	Yes

Public Holdings: (4 names)

Name	Agency	Level
Fort Belvoir Military Reservation	U.S. Dept. of Army	Federal
Jackson Mile Abbott Wetland Refuge	U.S. Dept. of Army	Federal
George Washington Grist Mill State Park	VA Dept. of Conservation and Recreation	State

Mason Neck State Park	VA Dept. of Conservation and Recreation	State

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
059	Fairfax	559	FESE	I

USGS 7.5' Quadrangles:
Fort Belvoir
Mount Vernon

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL27	Dogue Creek	72	FSST	I
PL28	Potomac River-Little Hunting Creek	68	FSST	I
PL29	Pohick Creek	70	FSST	I
PL30	Accotink Creek	72	FSST	I
PL48	Occoquan River-Belmont Bay	70	FSST	I
PL50	Potomac River-Occoquan Bay	71	FSST	I

Compiled on 6/19/2013, 12:32:20 PM V467183.0 report=V searchType= R dist= 4828.032 poi= 38,42,12.4 -77,09,52.3

| Wednesday, June 19, 2013 12:32:21 PM | **DGIF** | **Credits** | **Disclaimer** | Please view our **privacy policy** |
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VaFWIS - Department of Game and Inland Fisheries

38,42,12.4 -77,09,52.3

is the Search Point

Submit Cancel

Search Point

- ◯ **Change** to "clicked" map point
- ◯ **Fixed** at 38,45,11.1 -77,12,05.6

Show Position Rings

◯ Yes ◯ No

1 mile and 1/4 mile at the **Search Point**

Show Search Area

◯ Yes ◯ No

3 Search distance miles radius

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

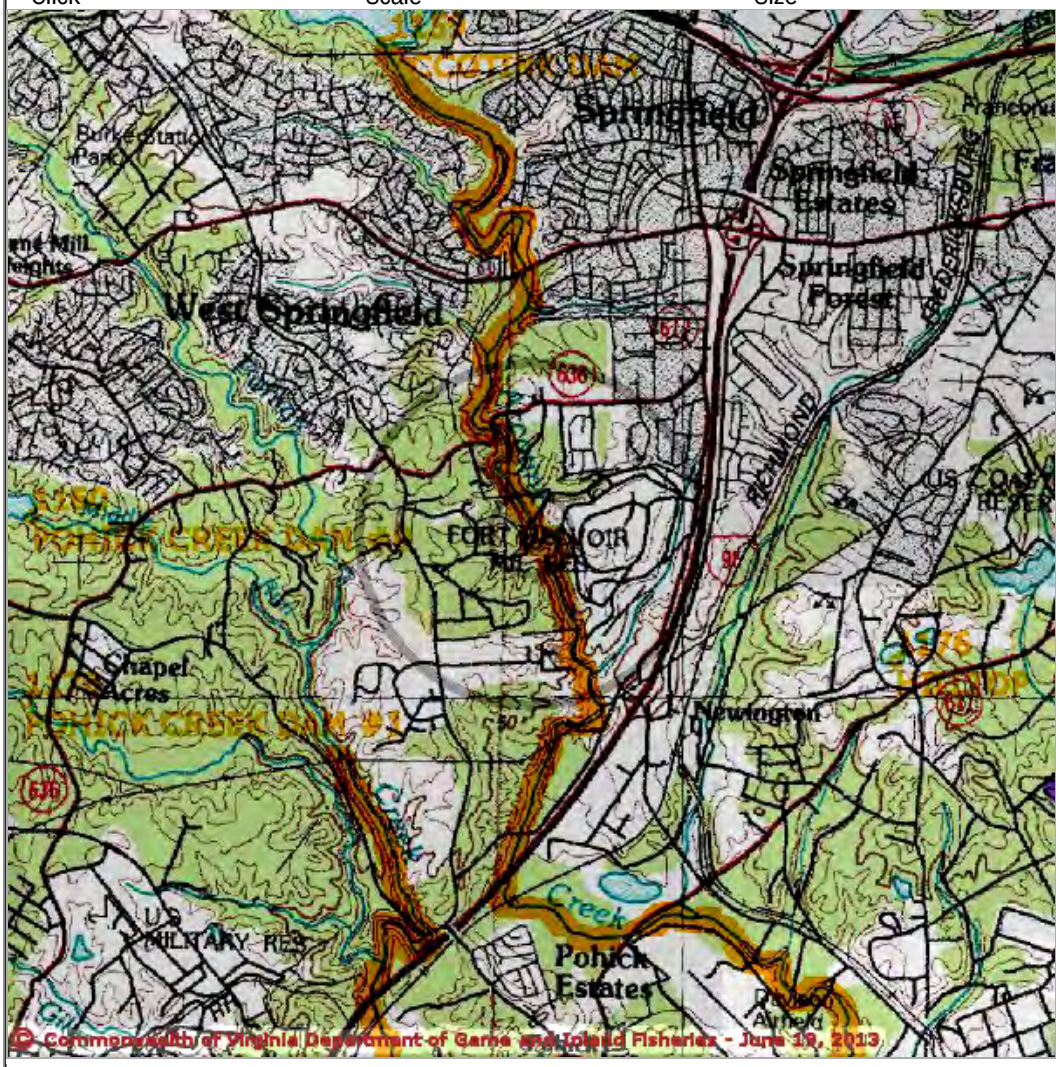
Current List: Anadromous, TEWaters, BAEANests, BECAR, Position

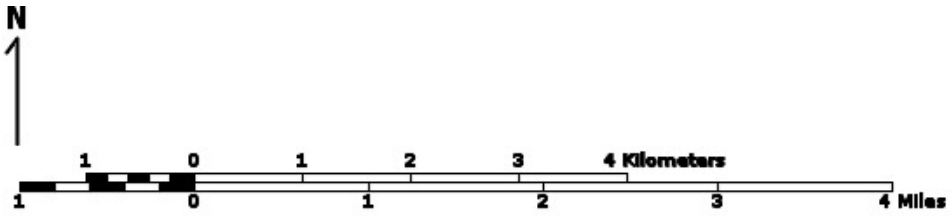
Map Overlay Legend

Virginia Fish and Wildlife Information Service

back | Refresh Browser Page

Map Click: Pan Id M | Map Scale: In Zoom Out | Screen Size: Small Size Big | Help





Point of Search 38,45,11.1 -77,12,05.6
Map Location 38,45,11.1 -77,12,05.6

Select **Coordinate System:**

- ◯ Degrees,Minutes,Seconds Latitude - Longitude
- ◯ Decimal Degrees Latitude - Longitude
- ◯ Meters UTM NAD83 East North Zone
- ◯ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for

T & E Waters

Federal

State

Anadromous Fish Reach

Confirmed

Potential

Impediment

Position Rings 1 mile and 1/4 mile at the Search Point

Bald Eagle Concentration Areas and Roosts

Bald Eagle nests 660 and 330 foot management zones

details)

Map projection is UTM Zone 18 NAD 1983 with left 303893 and top 4296478. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West.Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2013-06-19 12:35:07 (qa/qc December 5, 2012 8:04 - tn=467186 dist=4828.032 Visitor)
$poi=38.7638468 -77.2069121

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Submit Query

VaFWIS Search Report Compiled on 6/19/2013, 12:42:51 PM

Help

Observations reported or potential habitat occurs within a 3 mile radius around point 38,45,11.1 -77,12,05.6
in 059 Fairfax County, VA

View Map of Site Location

569 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 28) (28 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus
060006	SE	II	Floater, brook	Alasmidonta varicosa
030062	ST	I	Turtle, wood	Glyptemys insculpta
040129	ST	I	Sandpiper, upland	Bartramia longicauda
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus

040379	ST	I	Sparrow, Henslow's	Ammodramus henslowii
100155	FSST	I	Skipper, Appalachian grizzled	Pyrgus wyandot
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans
070027	FS	I	Amphipod, Northern Virginia well	Stygobromus phreaticus
100248	FS	I	Fritillary, regal	Speyeria idalia idalia
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus
100154	FS	II	Butterfly, Persius duskywing	Erynnis persius persius
060029	FS	III	Lance, yellow	Elliptio lanceolata
030063	CC	III	Turtle, spotted	Clemmys guttata
030012	CC	IV	Rattlesnake, timber	Crotalus horridus
010077		I	Shiner, bridle	Notropis bifrenatus
040372		I	Crossbill, red	Loxia curvirostra
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius
040319		I	Warbler, black-throated green	Dendroica virens
040306		I	Warbler, golden-winged	Vermivora chrysoptera
040038		II	Bittern, American	Botaurus lentiginosus
040052		II	Duck, American black	Anas rubripes
040029		II	Heron, little blue	Egretta caerulea caerulea
040213		II	Owl, northern saw-whet	Aegolius acadicus
040105		II	Rail, king	Rallus elegans
040320		II	Warbler, cerulean	Dendroica cerulea
040304		II	Warbler, Swainson's	Limnothlypis swainsonii
040266		II	Wren, winter	Troglodytes troglodytes

To view All 569 species View 569

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams (2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different	Highest *	Highest **	

			Species	TE	Tier	
C2	Accotink creek	Confirmed	2		IV	Yes
C62	Pohick creek	Confirmed	3		IV	Yes

Impediments to Fish Passage (2 records)

View Map of All Fish Impediments

ID	Name	River	View Map
1159	ACCOTINK DAM	ACCOTINK CREEK	Yes
1176	HILLTOP DAM	TR-DOGUE CREEK	Yes

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species (4 Reaches)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Accotink Creek (20700102)		010077		I	Shiner, bridle	Notropis bifrenatus	Yes
(20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes
Rocky Branch (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes

South Run (20700102)	ST	030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (8 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
53194	Annandale, CE	49		IV	Yes
53193	Annandale, CW	72		II	Yes
53196	Annandale, SE	73		IV	Yes
53195	Annandale, SW	47		IV	Yes
52196	Fairfax, SE	69		II	Yes
53182	Fort Belvoir, NE	71		III	Yes
53181	Fort Belvoir, NW	43		IV	Yes
52182	Occoquan, NE	59		IV	Yes

Public Holdings: (1 names)

Name	Agency	Level
Fort Belvoir Military Reservation	U.S. Dept. of Army	Federal

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
059	Fairfax	559	FESE	I

USGS 7.5' Quadrangles:
Occoquan
Fairfax
Fort Belvoir
Annandale

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL26	Cameron Run	68	FSST	I
PL27	Dogue Creek	72	FSST	I
PL29	Pohick Creek	70	FSST	I
PL30	Accotink Creek	72	FSST	I

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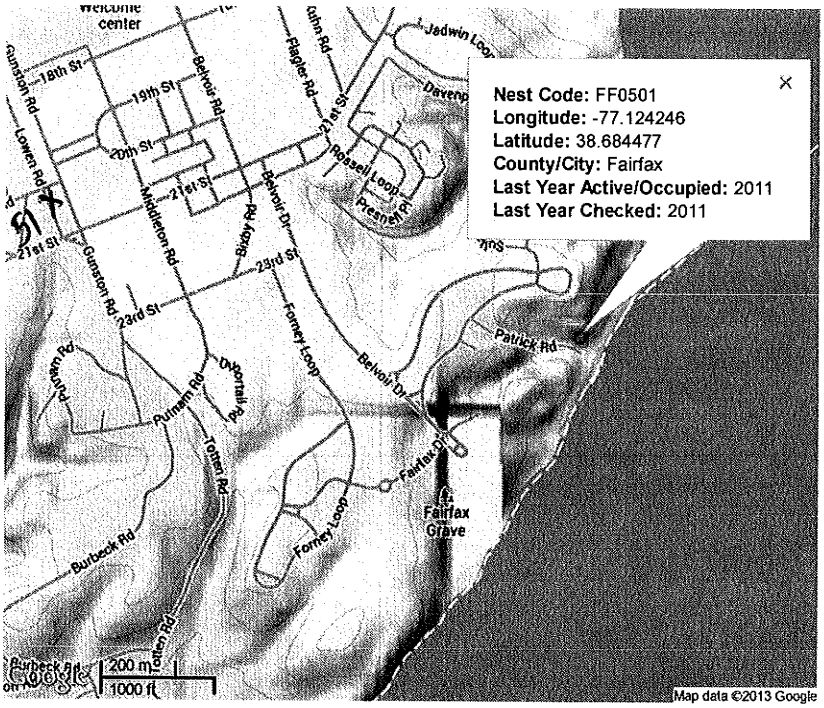

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Help CCB by Reporting Eagle Nest Locations

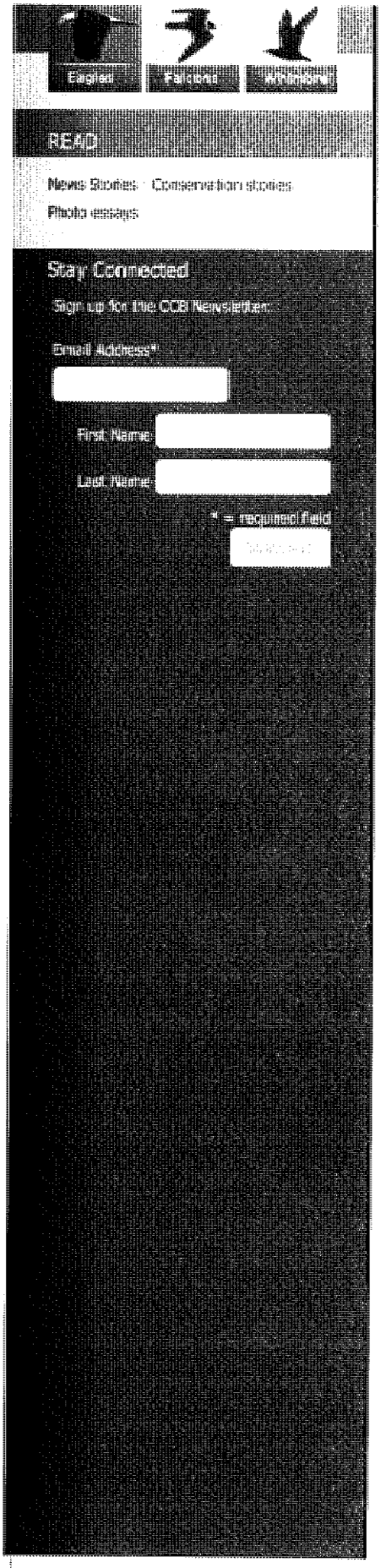
Despite our best efforts, an unknown number of eagle nests go unrecorded each year. This is particularly true in the Piedmont and mountains of Virginia where the survey does not cover. We believe that the public knows of many nests that are unknown to us. All active or recently active nests known to CCB (surveyed in last year's Annual Bald Eagle Survey plus reported with confirmed location) are presented in the eagle nest locator. Please view nests in your local area and report nests known to you that do not appear. Visit our Report a Nest page for instructions. Thanks for your help!

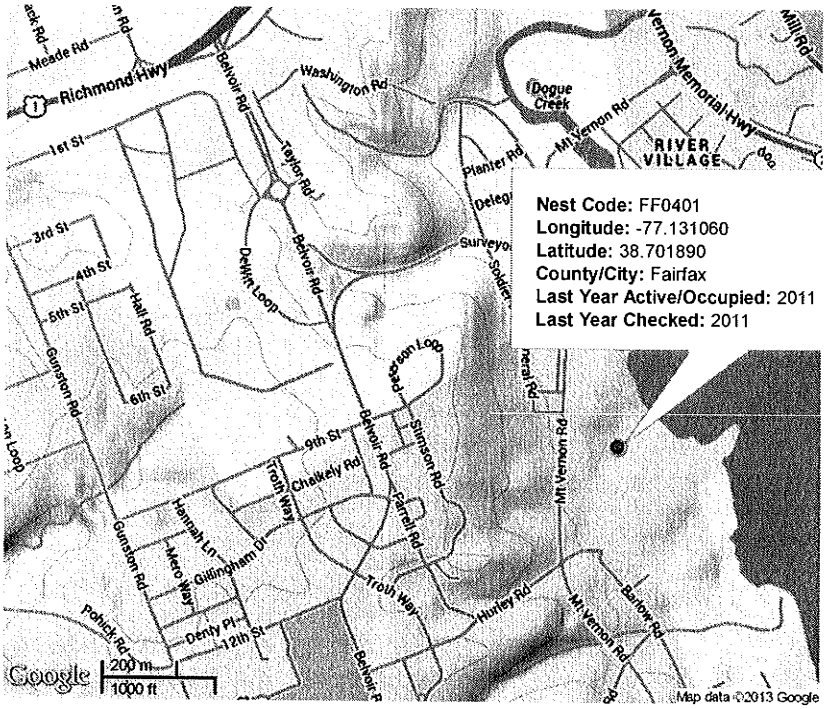
Annual Survey

The data contained in the VaEagles Nest Locator comes directly from Virginia's annual bald eagle survey. Breeding eagles have been surveyed annually in the lower Chesapeake Bay since 1956. The 2012 survey represents the 57th consecutive survey. Each year CCB biologists fly a nest survey in February and March to map eagle nests and to determine their activity status. This survey is followed in late April and May by a productivity survey where chicks are counted in each nest. The survey covers all tributaries of the lower Chesapeake, as well as, other prominent bodies of water and requires more than 100 hours of flight time in a high-wing Cessna. Biologists survey all known nest structures to determine their activity status and search for newly established nests. During the 2011 breeding season, CCB surveyed more than 1000 nest structures and documented more than 730 breeding pairs that produced more than 980 chicks.

Regulatory Contacts

Bald Eagles are sensitive to human disturbance. Since the 1970s nest sites have been managed using a combination of spatial buffers and time-of-year restrictions. Human activities that are considered to be detrimental to breeding pairs (e.g. residential, commercial, and industrial





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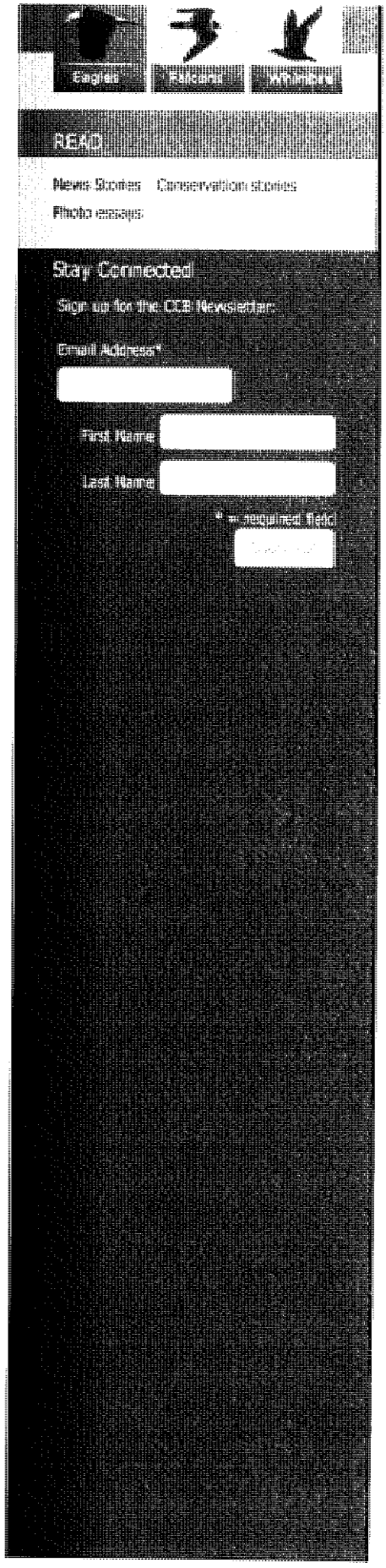

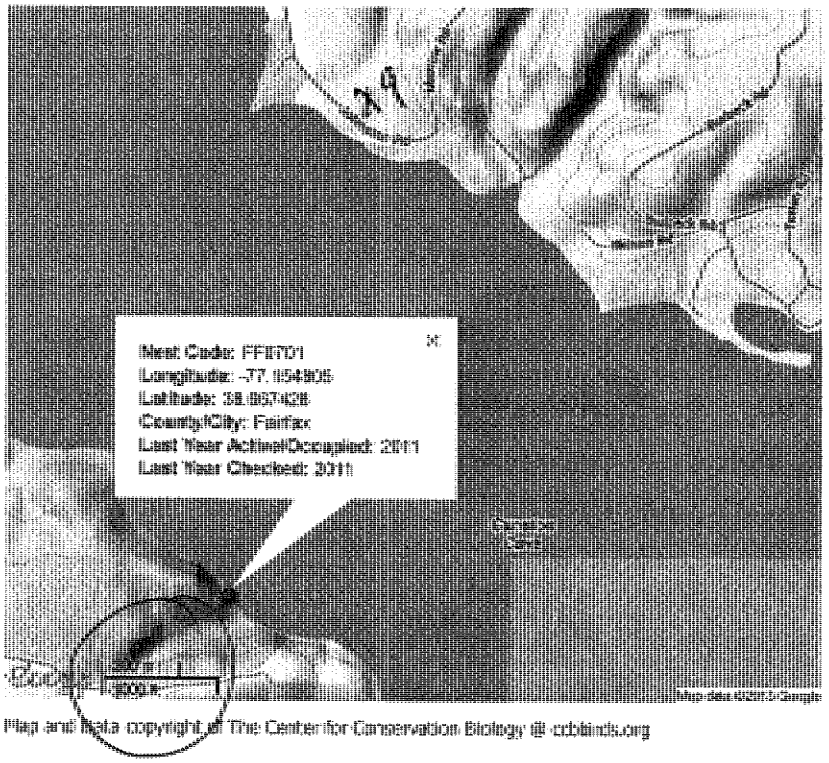

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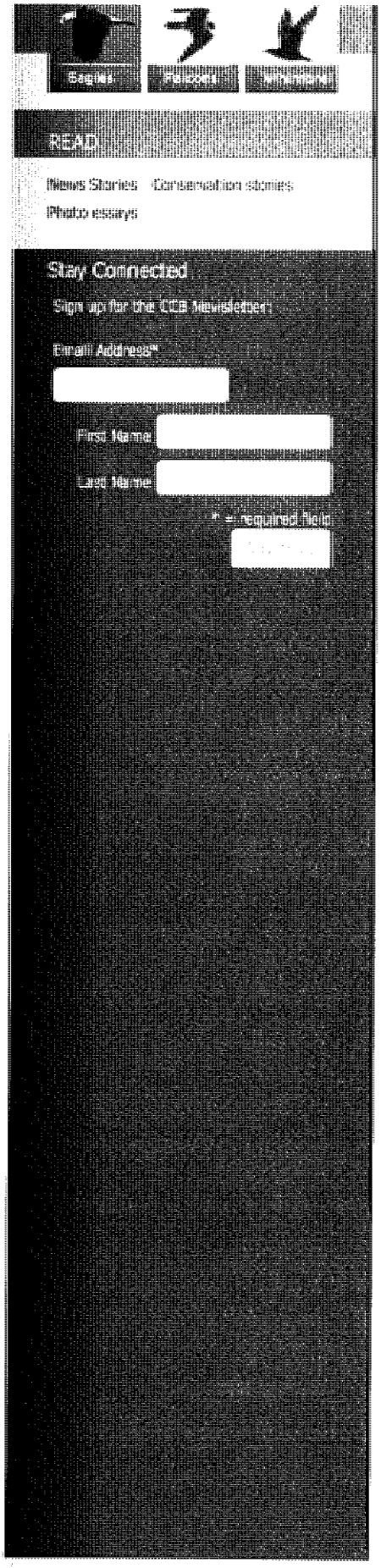

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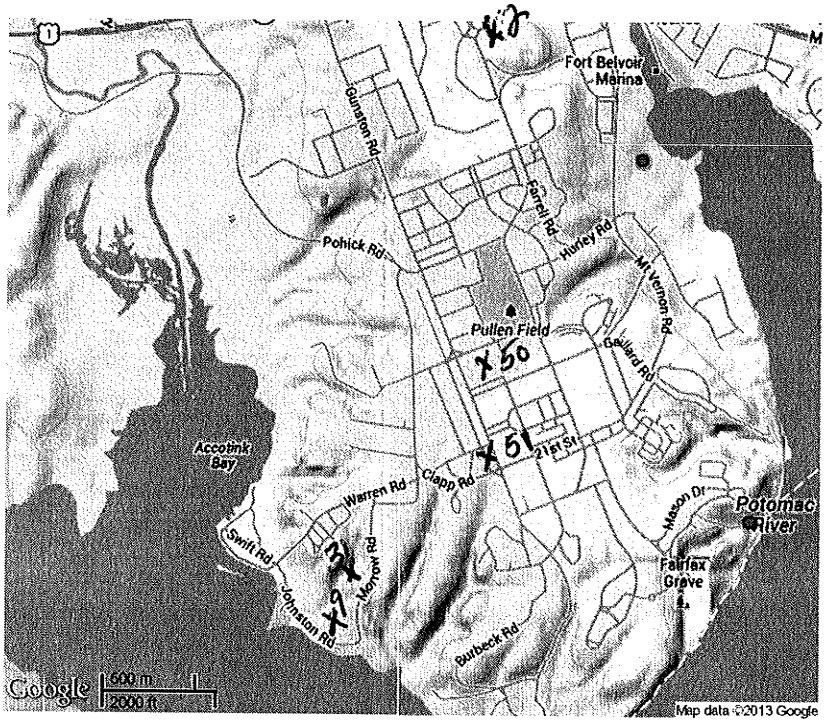

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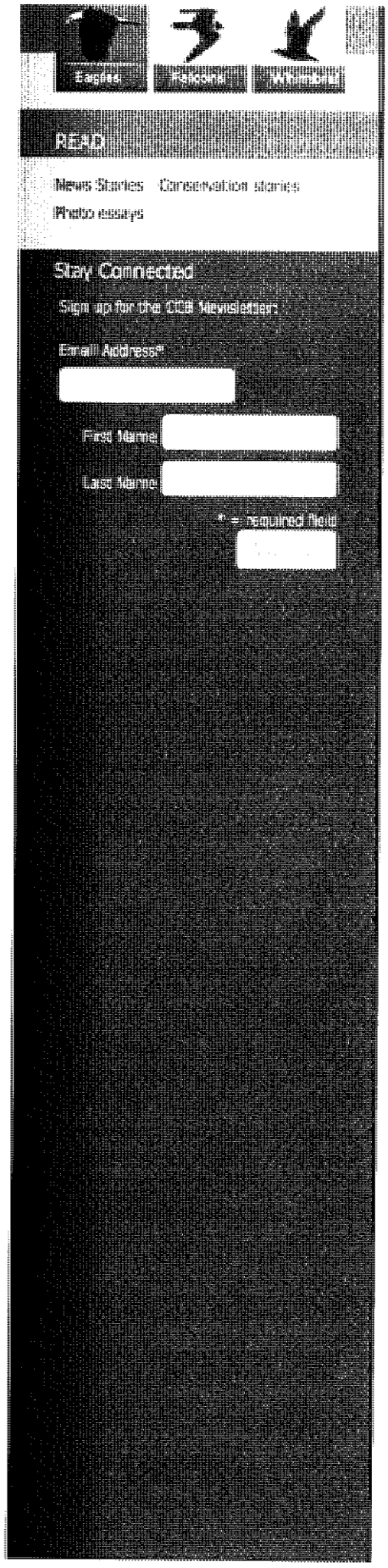

development, logging, use of toxic chemicals) are restricted within a "primary buffer" and human activities that are considered to impact the integrity of the primary buffer (e.g. construction of high-density developments, multi-story buildings, new roadways) are restricted within a "secondary buffer". Time-of-year restrictions are used to limit direct human activities (e.g. recreational activities, logging, mineral exploration, low-level aircraft operations) within buffer areas that may disturb eagles during sensitive periods of the nesting cycle.

The Virginia Department of Game and Inland Fisheries (VDGIF) has legal jurisdiction over issues relating to bald eagle protection. The VDGIF, through its environmental services section, reviews proposed projects from government agencies and private individuals to identify possible impacts. Such reviews are encouraged and usually result in a considerable savings in time and money to the landowner. The two agencies listed here are the lead agencies for bald eagle reviews and recommendations in Virginia.

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230-1104
(804) 367-8999

U. S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

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Janet O'Neill

From: janet1118 <janet1118@verizon.net>
Sent: Tuesday, February 25, 2014 9:01 PM
To: Janet O'Neill
Subject: Fwd: RE: Fort Belvoir Real Property Master Plan - Project Review Request

Sent from my Verizon Wireless 4G LTE Smartphone

-------- Original message --------
From: Troy Andersen
Date:02/24/2014 9:41 AM (GMT-05:00)
To: JanetO'Neill
Cc: Sarah Nystrom
Subject: RE: Fort Belvoir Real Property Master Plan - Project Review Request

Ma'am:

I wanted to close the loop on this project with a few comments.

We have reviewed the project package received on October 21, 2013 for the referenced project. The following comments are provided under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended, and Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 54 Stat. 250) as amended.

We concur with the determinations provided in the revised Species Conclusion Table dated November 27, 2013. As one of the project areas does intersect with an eagle concentration area, please work with Sarah Nystrom (cc'd above) to ensure that the particular projects in this area are planned in a manner that minimizes potential impacts to bald eagles.

Should project plans change or if additional information on the distribution of listed species or critical habitat becomes available, this determination may be reconsidered. If you have any questions, please contact me.

V/R
Troy

Troy M. Andersen

Endangered Species/Conservation Planning Assistance Supervisor

USFWS – Virginia Field Office

Phone: 804-693-6694 Ext. 166

Mobile: 804-654-9235

Visit us at: http://www.fws.gov/northeast/virginiafield/

From: JanetO'Neill [mailto:janet1118@verizon.net]
Sent: Monday, October 21, 2013 12:07 PM
To: troy_andersen@fws.gov
Cc: Penny.Douglas@aecom.com
Subject: Fort Belvoir Real Property Master Plan - Project Review Request

Dear Mr. Andersen,

Attached is a PDF binder for a Project Review for the subject project. The United States (U.S.) Army Garrison Fort Belvoir is in the process of developing a new RPMP for Fort Belvoir's Main Post and the Fort Belvoir North Area. They are also preparing an EIS to address adoption of the RPMP and implementation of the plan's proposed short-term (2012 – 2017) development projects. These include 52 site development and seven transportation improvement projects. The EIS will also, to the extent that we have information, address ten long-term (2018 – 2030) development and ten long-term transportation improvement projects.

I am also sending a hard copy of the attached materials via regular mail. Please note, the letter from the VDCR-DNH attached separately was password protected and would not combine into the PDF binder.

If you have any questions, pleas call me at 540-219-0322.

Janet O'Neill

Carter's Run Environmental Corporation

7137 Wilson Road, Marshall, VA 20115 540-349-3263
540-219-0322

Janet1118@verizon.net

Doug Domenech
Secretary of Natural Resources

COMMONWEALTH of VIRGINIA

Department of Game and Inland Fisheries

Robert W. Duncan
Director

July 30, 2013

Janet C. O'Neill
Carter's Run Environmental Corporation

via email: janet1118@verizon.net

Re: Fort Belvoir Real Property Master Plan

Dear Ms. O'Neill,

We appreciate your interest in submitting your project(s) for review by VDGIF to ensure the protection of sensitive wildlife resources during project development. Unfortunately, due to staffing limitations, we are unable to review pre-applications or scoping documents submitted to our Department. Please note that lack of a response from VDGIF does not constitute a "no comment" response, nor does it imply support of the project or associated activities. It simply means that VDGIF is unable to review your pre-application submittal.

To review your project site for the location of wildlife resources under our jurisdiction, including threatened and endangered wildlife, we recommend accessing the Virginia Fish and Wildlife Information System (VAFWIS) at http://vafwis.org/fwis/.

If you have further questions or need additional information about VDGIF's Environmental Programs, please visit: http://www.dgif.virginia.gov/environmental-programs/.

Please feel free to attach a copy of this correspondence to any applications or documents you may submit for your project to state or federal permitting agencies.

Sincerely,

Angela G. Weller
Environmental Services Section

4010 WEST BROAD STREET, P.O. BOX 11104, RICHMOND, VA 23230-1104
(804) 367-1000 (V/TDD) ***Equal Opportunity Employment, Programs and Facilities*** **FAX (804) 367-9147**

SMALL AREA MAPS

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WATER RESOURCES SMALL AREA MAPS

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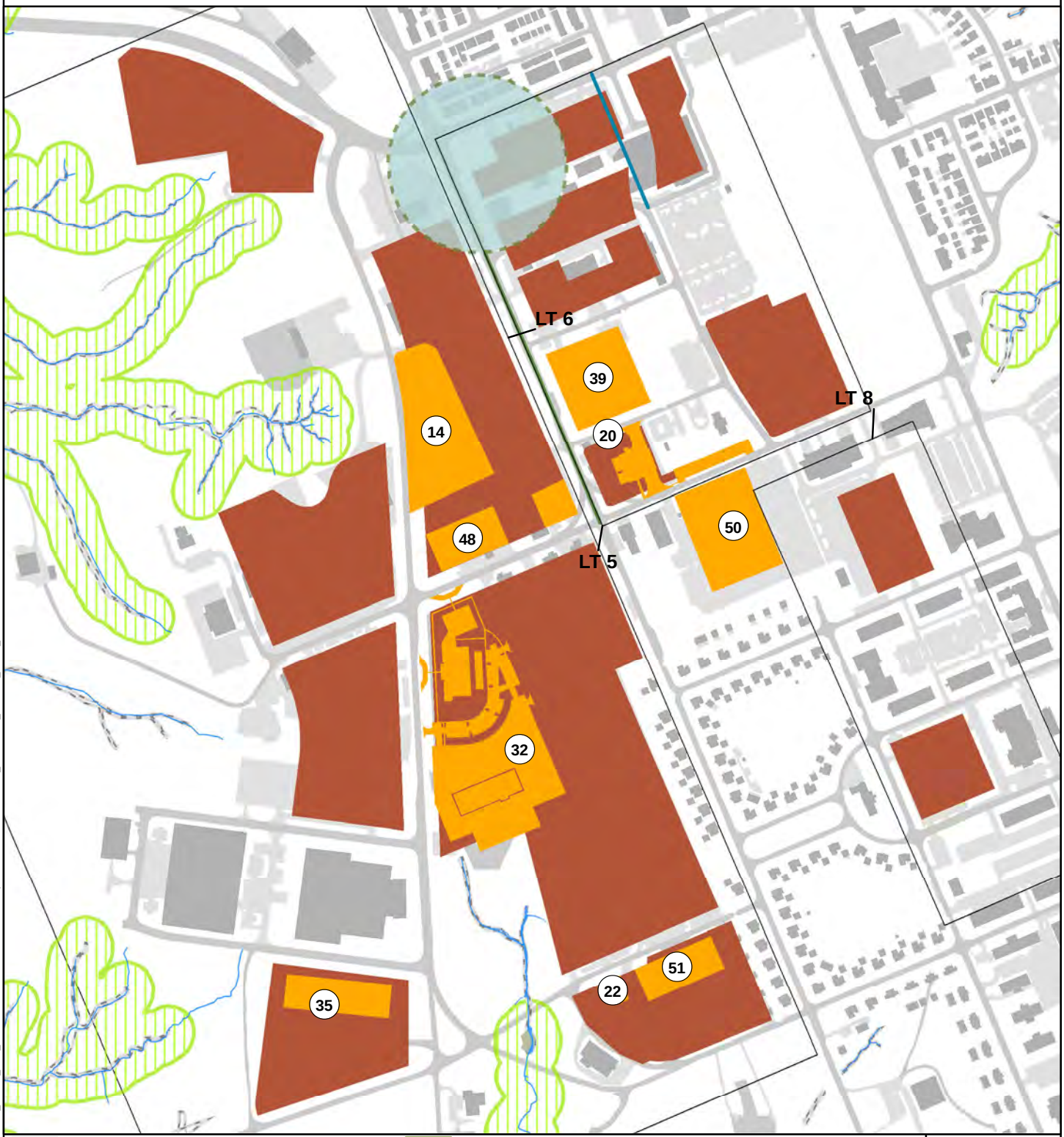
Water and Associated Sensitive Resources - South Post Town Center, Industrial Area, 200 Area



Planning Level Wetland Survey
PEM
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Stream (R2/R3/R4)
Surface Water
RPA Boundary
100-year Floodplain
New ACP (2017)
New ACP (2030)

Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road

Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

Fort Belvoir RPMP EIS

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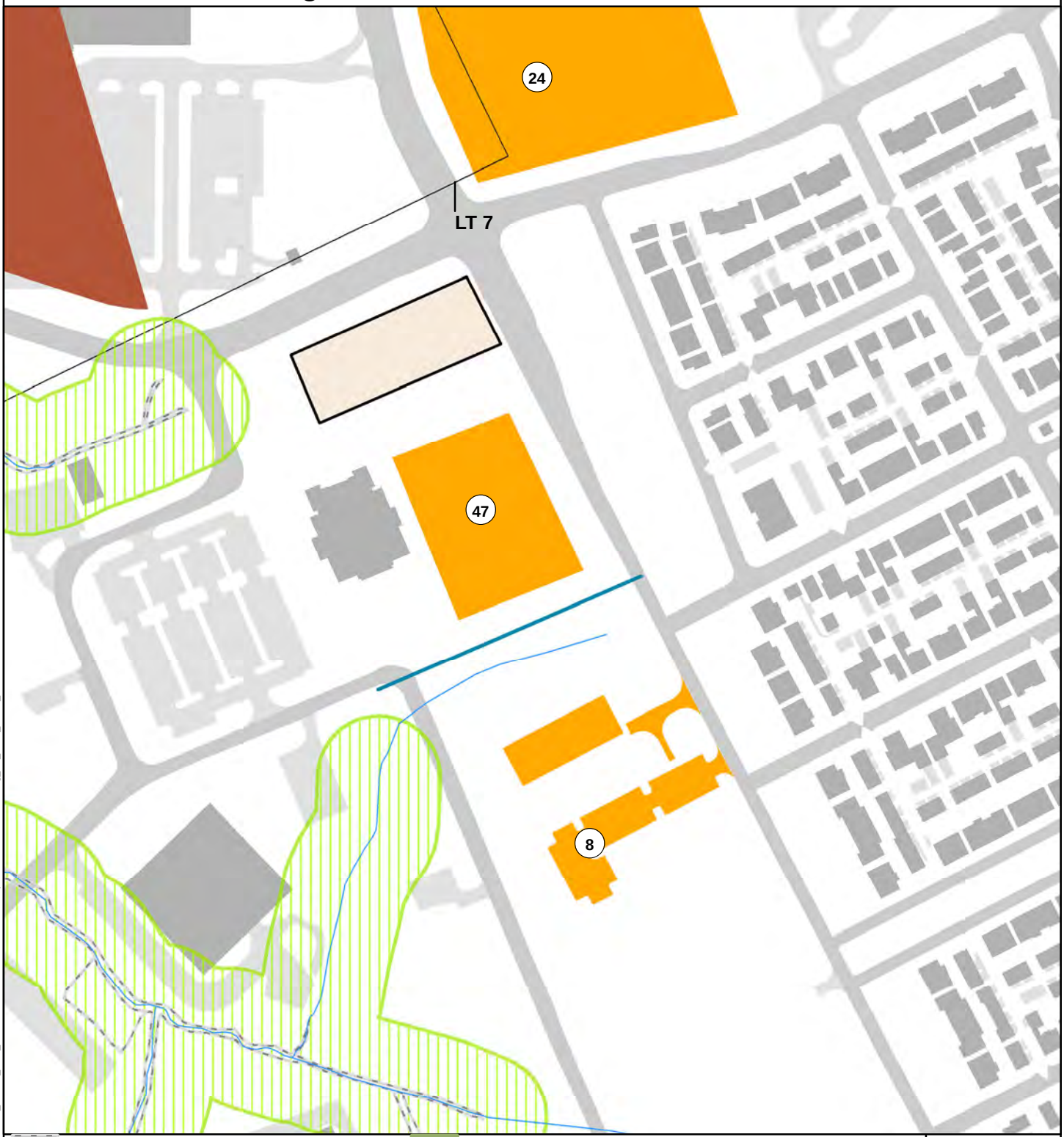
Water and Associated Sensitive Resources - Religious Education Center, CDC 144



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Installation Boundary

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Fort Belvoir RPMP EIS

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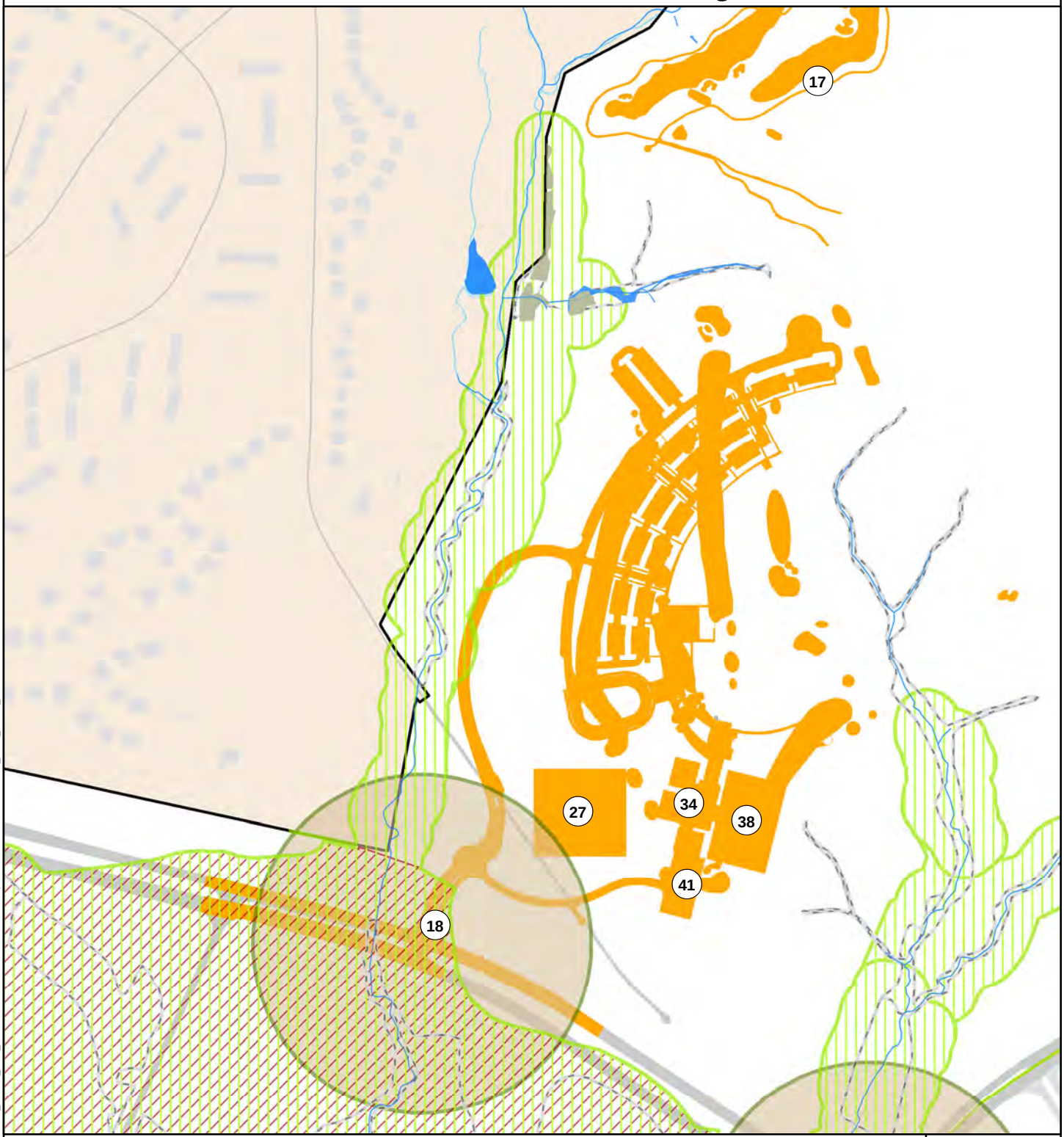
Water and Associated Sensitive Resources - NMUSA & Golf Course Reconfiguration



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Fort Belvoir RPMP EIS

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Water and Associated Sensitive Resources - NICoE, Medical Office Building, USO

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Fort Belvoir RPMP EIS

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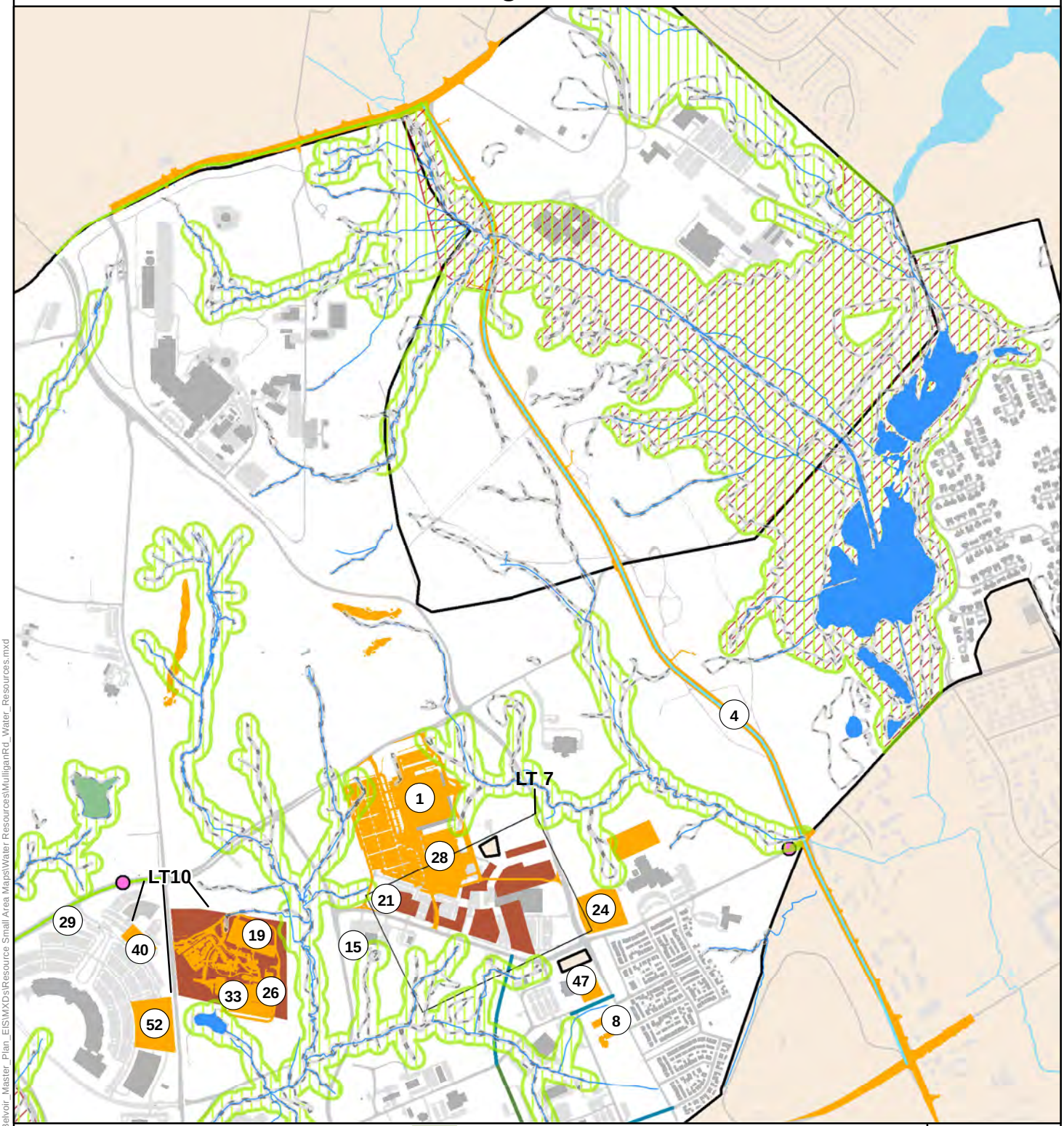
Water and Associated Sensitive Resources - Mulligan Road



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Fort Belvoir RPMP EIS

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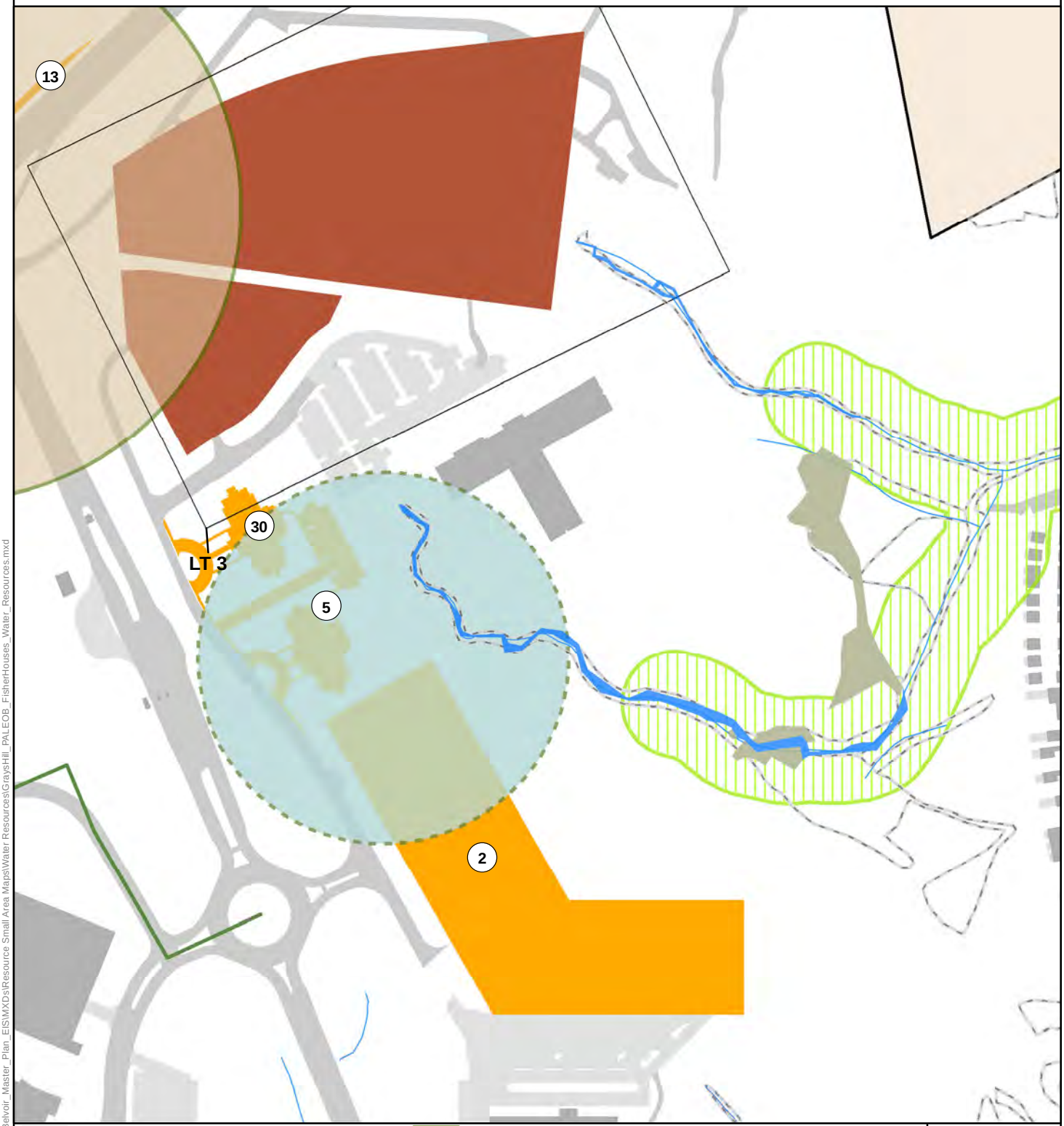
Water and Associated Sensitive Resources - Grays Hill, PAL East of Belvoir Rd, Fisher House 1 & 2



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Fort Belvoir RPMP EIS

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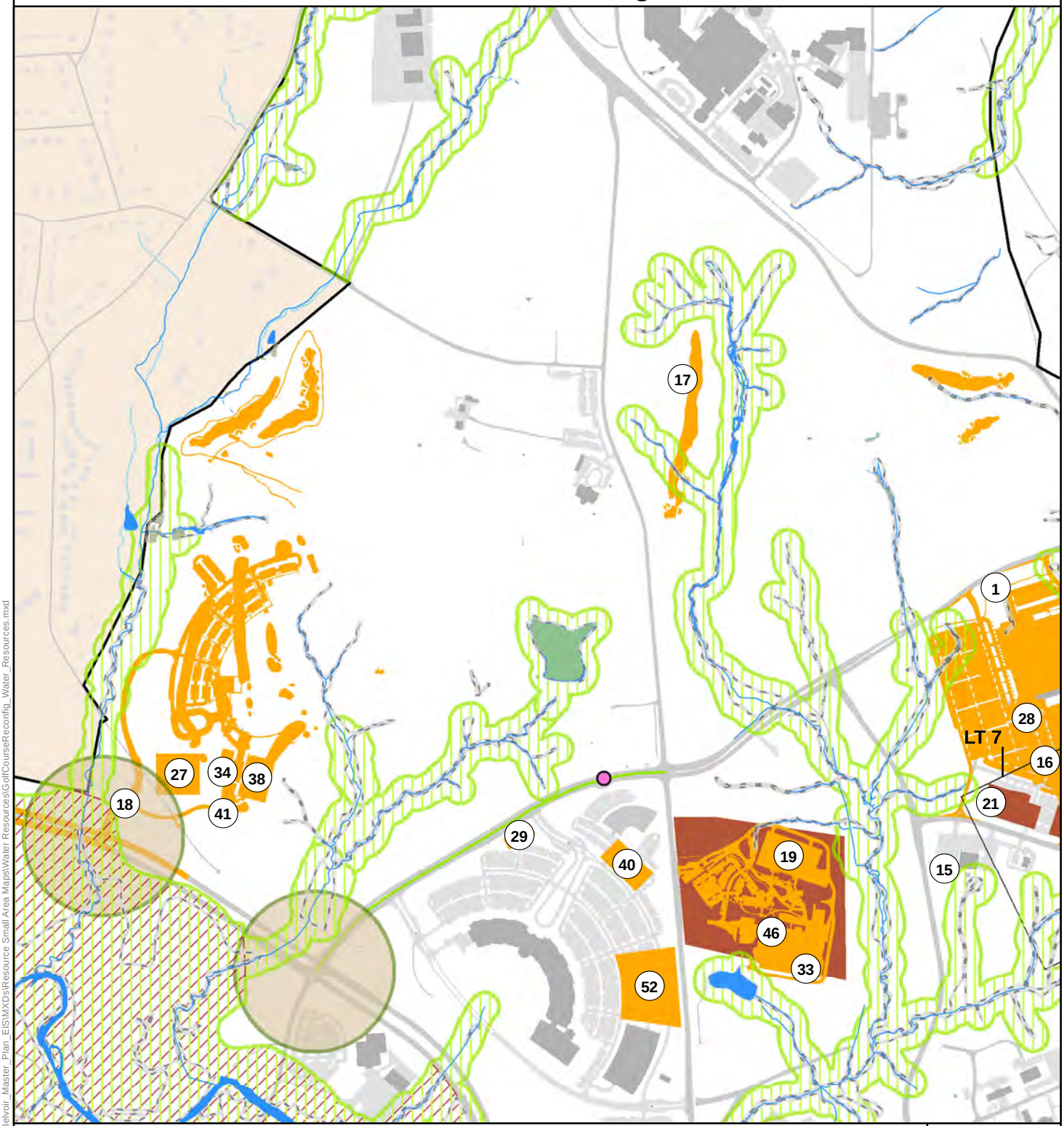
Water and Associated Sensitive Resources - Golf Course Reconfiguration



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Fort Belvoir RPMP EIS

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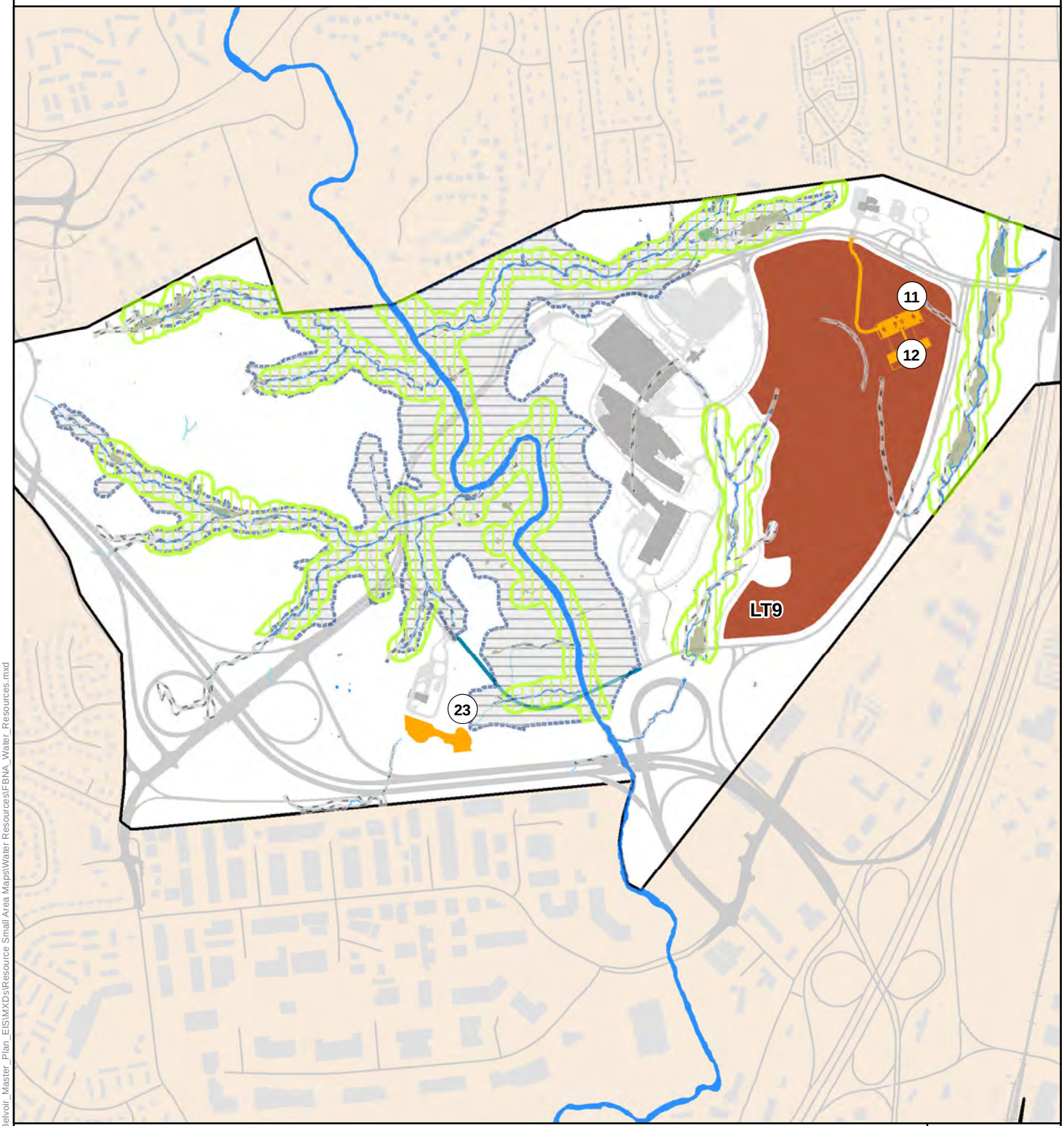
Water and Associated Sensitive Resources - Fort Belvoir North Area



EQC Boundary
Planning Level Wetland Survey
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Stream (R2/R3/R4)
Surface Water
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EQC Boundary
New ACP (2017)

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Fort Belvoir RPMP EIS

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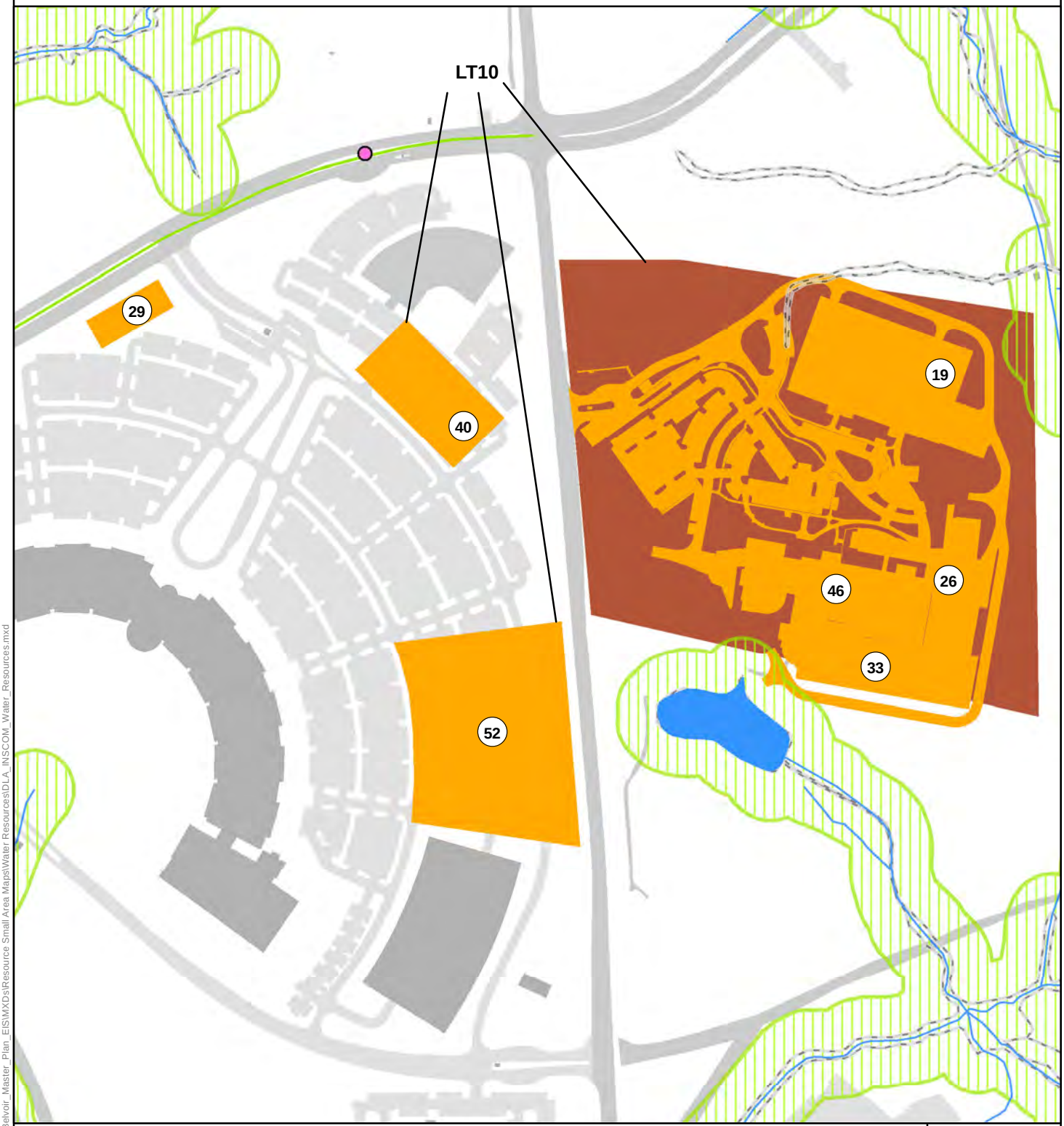
Water and Associated Sensitive Resources - DLA & INSCOM



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Fort Belvoir RPMP EIS

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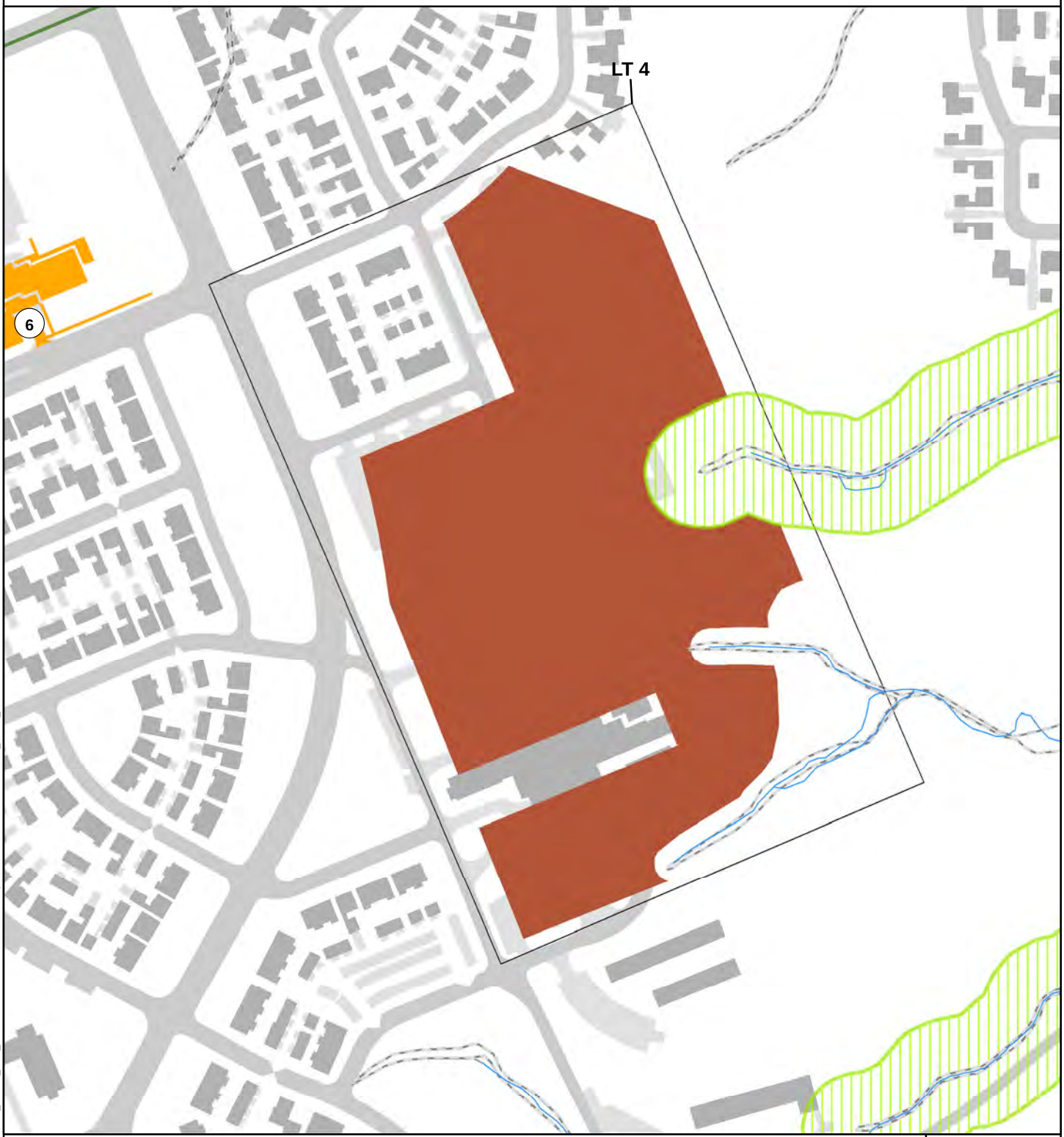
Water and Associated Sensitive Resources - DeWitt Area



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Fort Belvoir RPMP EIS

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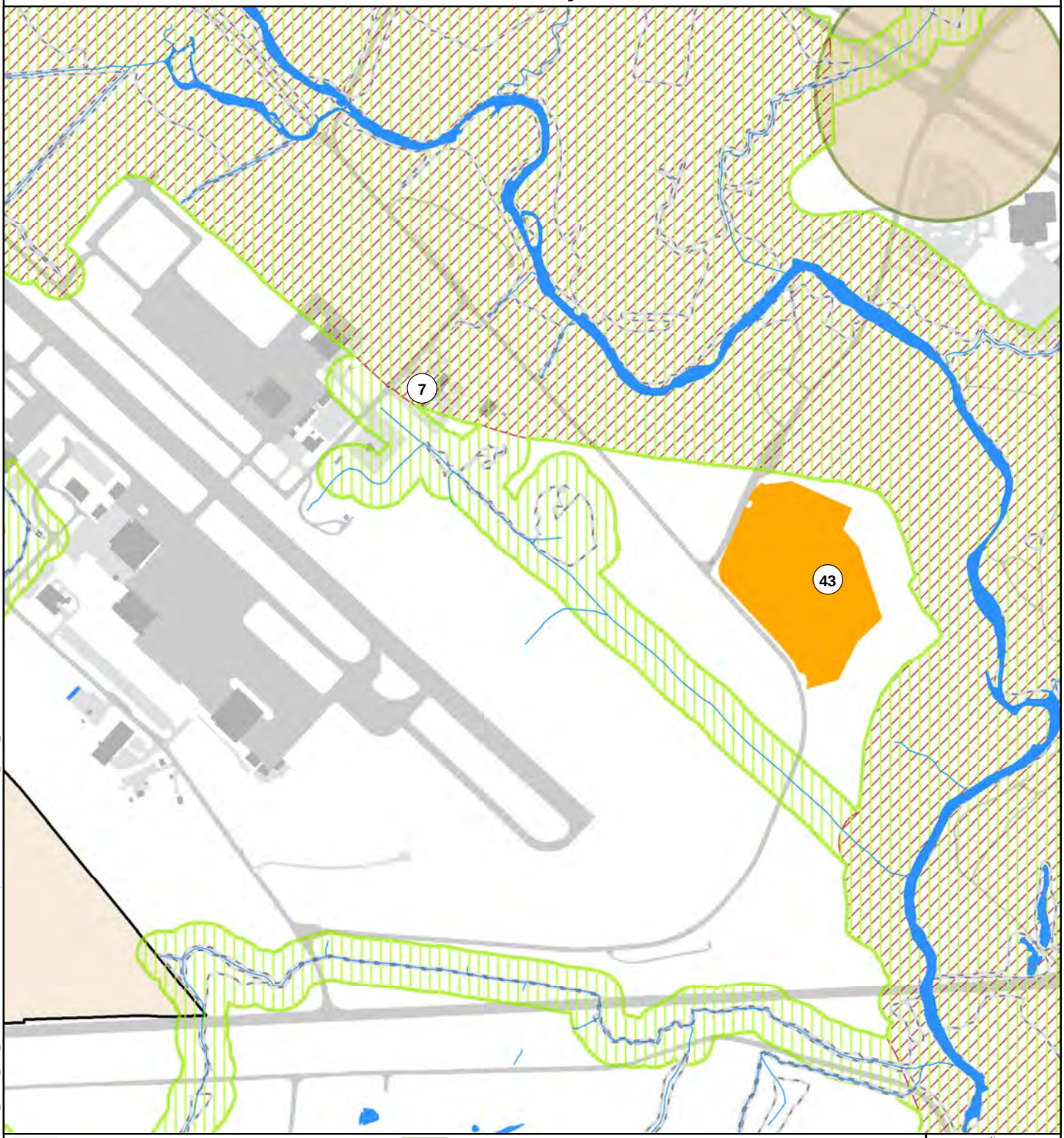
Water and Associated Sensitive Resources - Davison Army Airfield



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Fort Belvoir RPMP EIS

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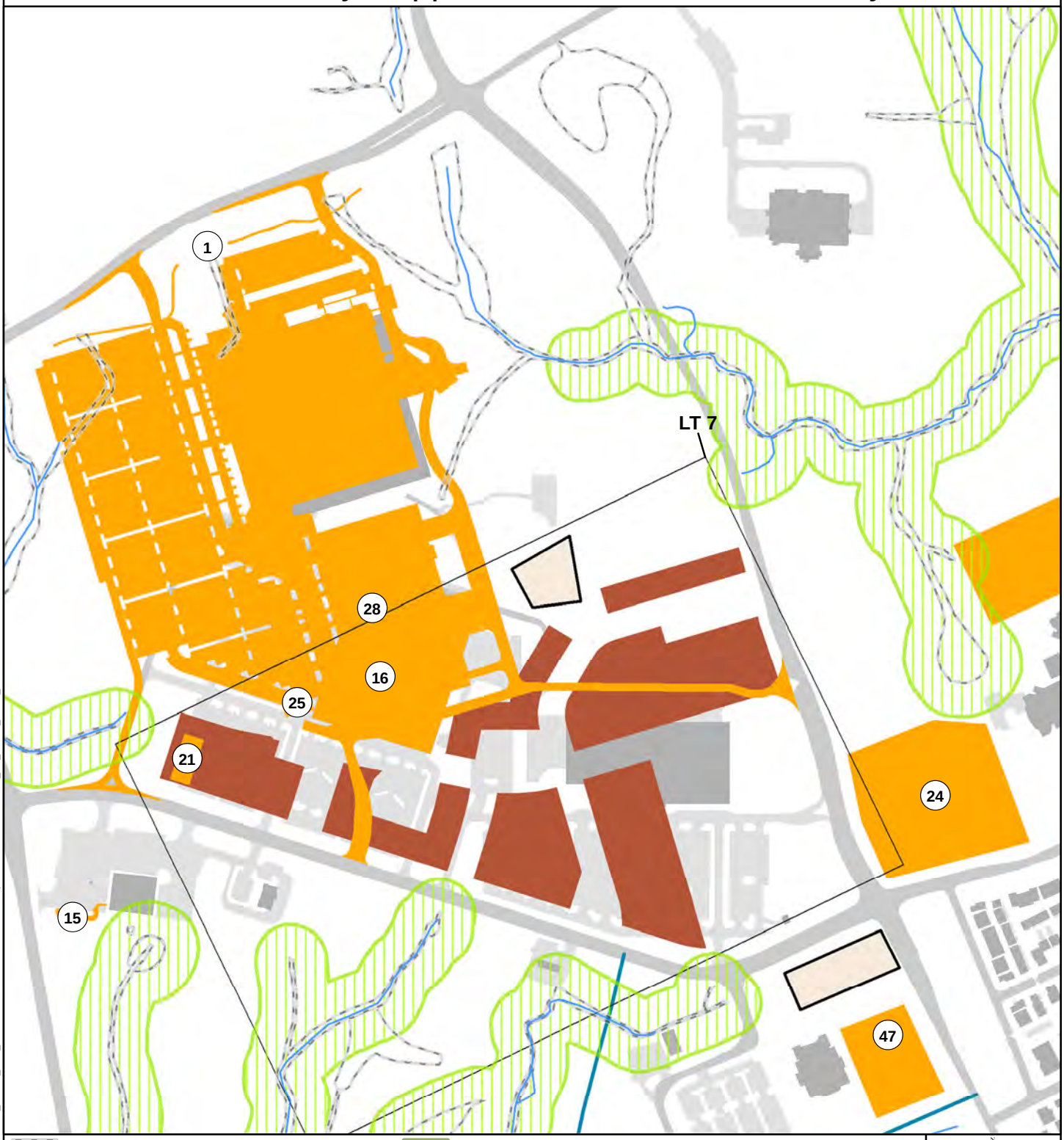
Water and Associated Sensitive Resources - Community Support Center, PX, Commissary



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Fort Belvoir RPMP EIS

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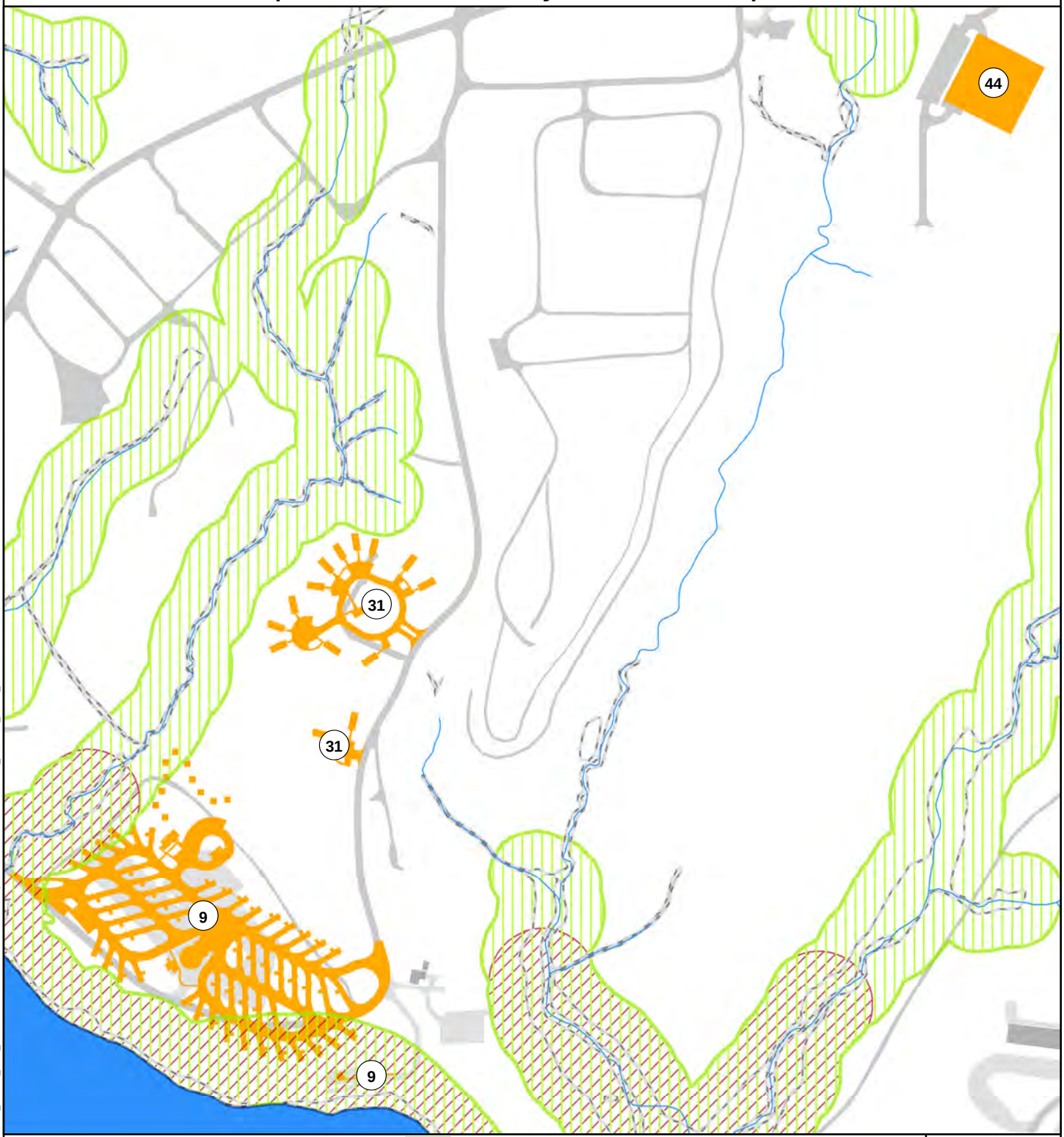
Water and Associated Sensitive Resources - Ballfield Replacement, Family Travel Camp Phase 1 & 2



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Fort Belvoir RPMP EIS

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Water and Associated Sensitive Resources - Gunston Road Office Area (1400 Area & Secure Admin Facility)

Planning Level Wetland Survey
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Stream (R2/R3/R4)
Surface Water
RPA Boundary
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Installation Boundary

Fort Belvoir RPMP EIS

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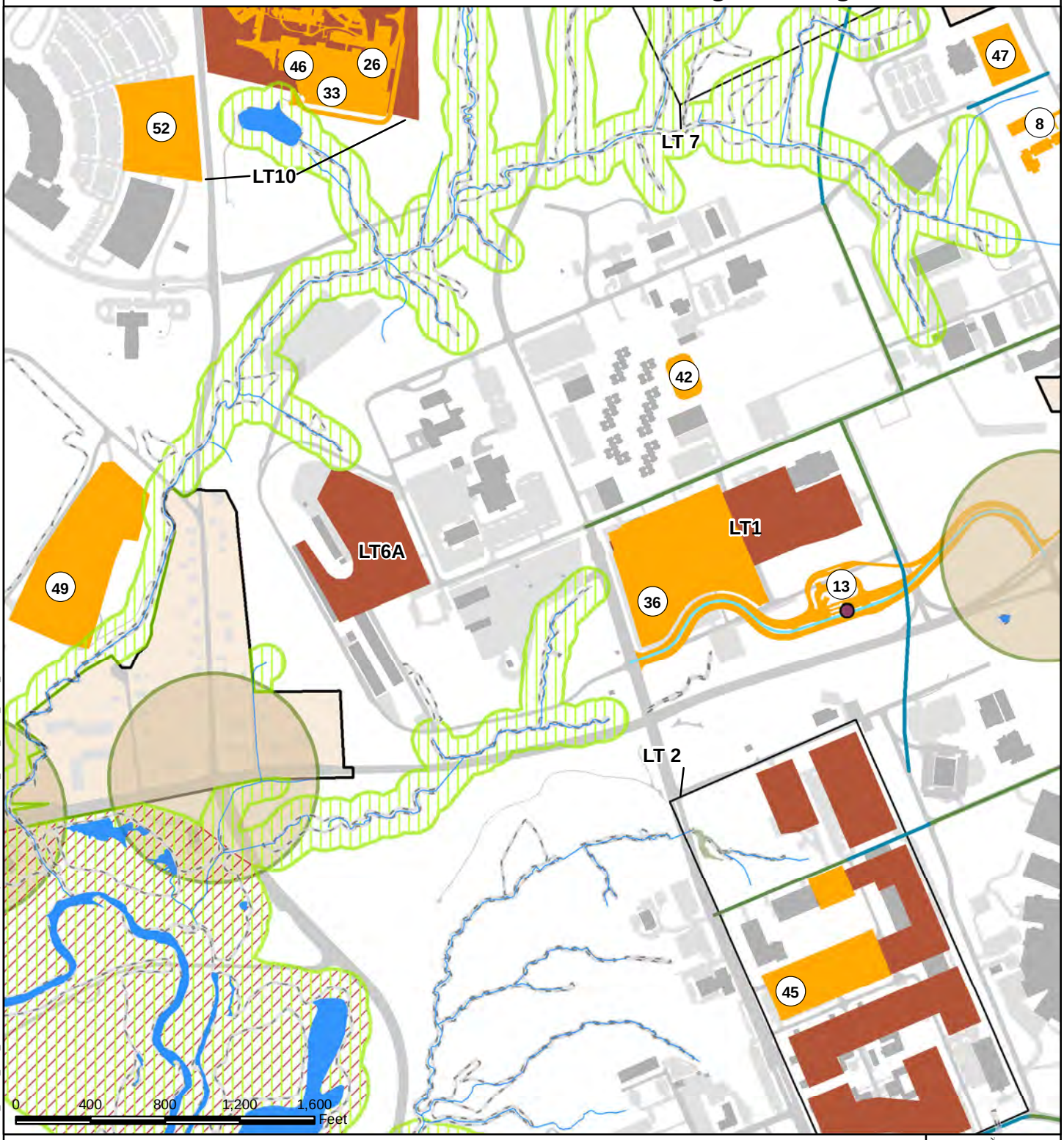
Water and Associated Sensitive Resources - 29th Infantry HQ, Lieber Gate, OCAR Block, 911th Engineering Co.



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Fort Belvoir RPMP EIS

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ECOLOGICAL RESOURCES SMALL AREA MAPS

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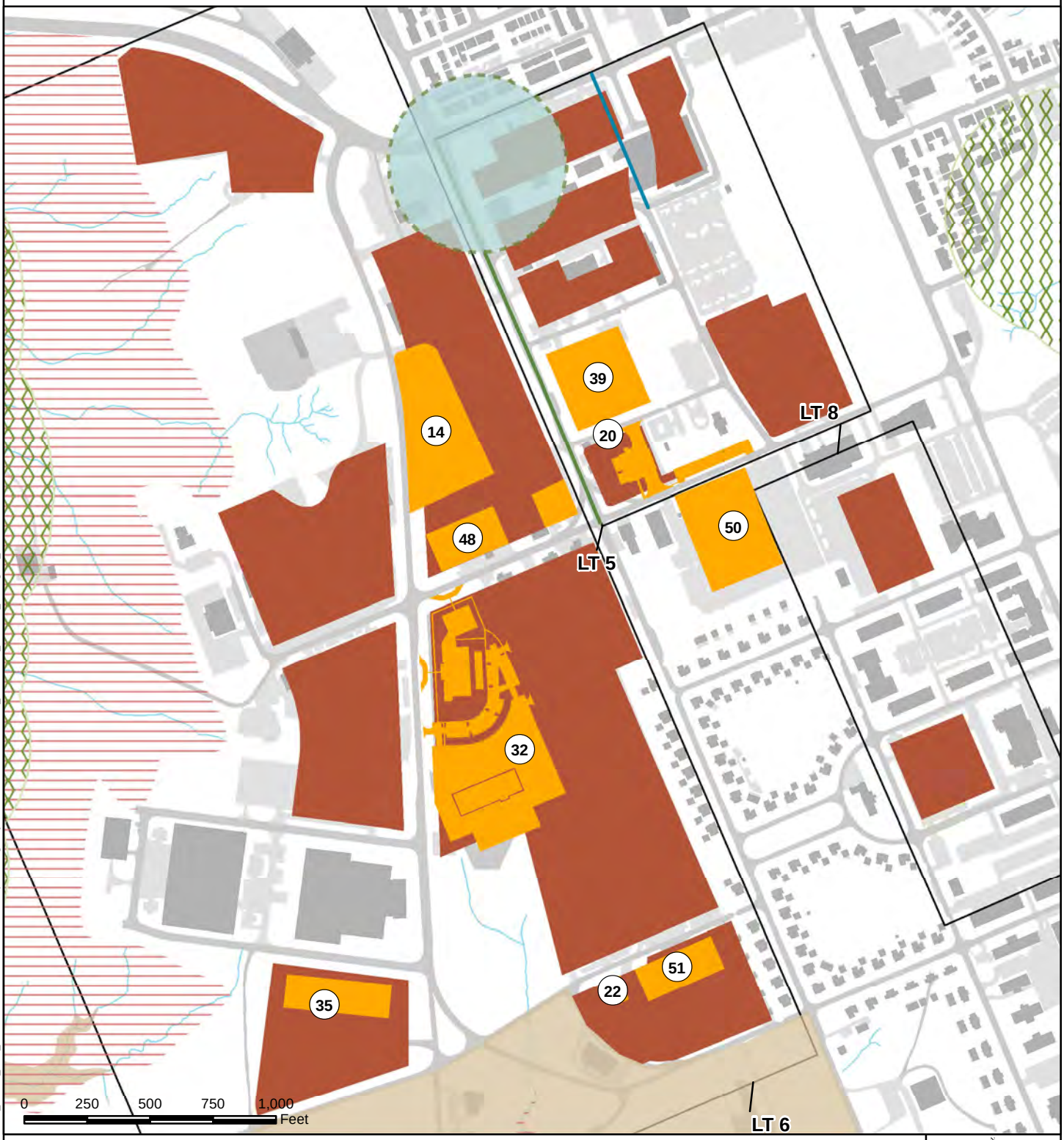
Ecologically Sensitive Resources - South Post Town Center, Industrial Area, 200 Area



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
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Fort Belvoir RPMP EIS

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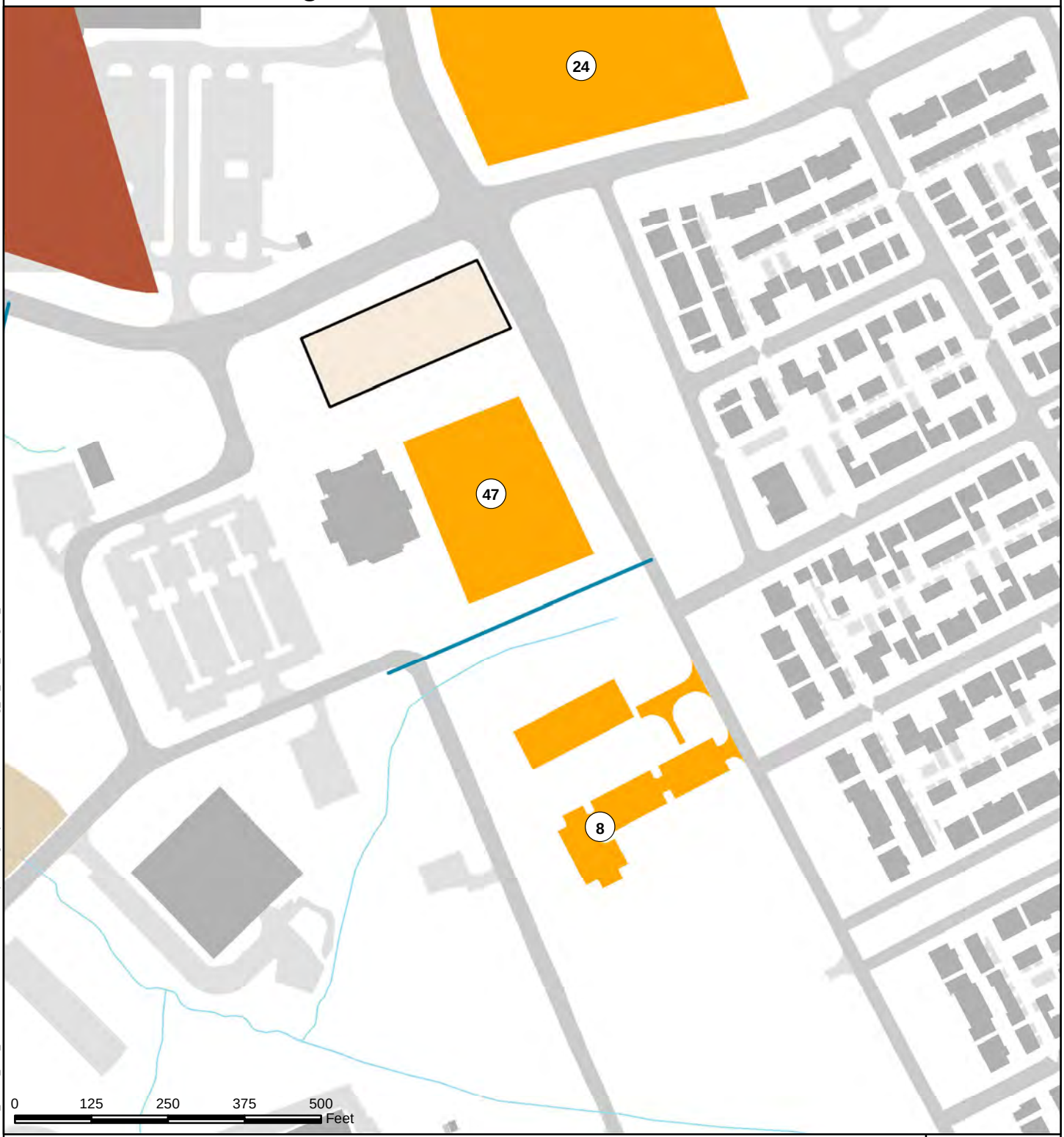
Ecologically Sensitive Resources - Religious Education Center, CDC 144



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Fort Belvoir RPMP EIS

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Ecologically Sensitive Resources - NMUSA & Golf Course Reconfiguration

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Fort Belvoir RPMP EIS

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Ecologically Sensitive Resources - NICoE, Medical Office Building, USO

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Fort Belvoir RPMP EIS

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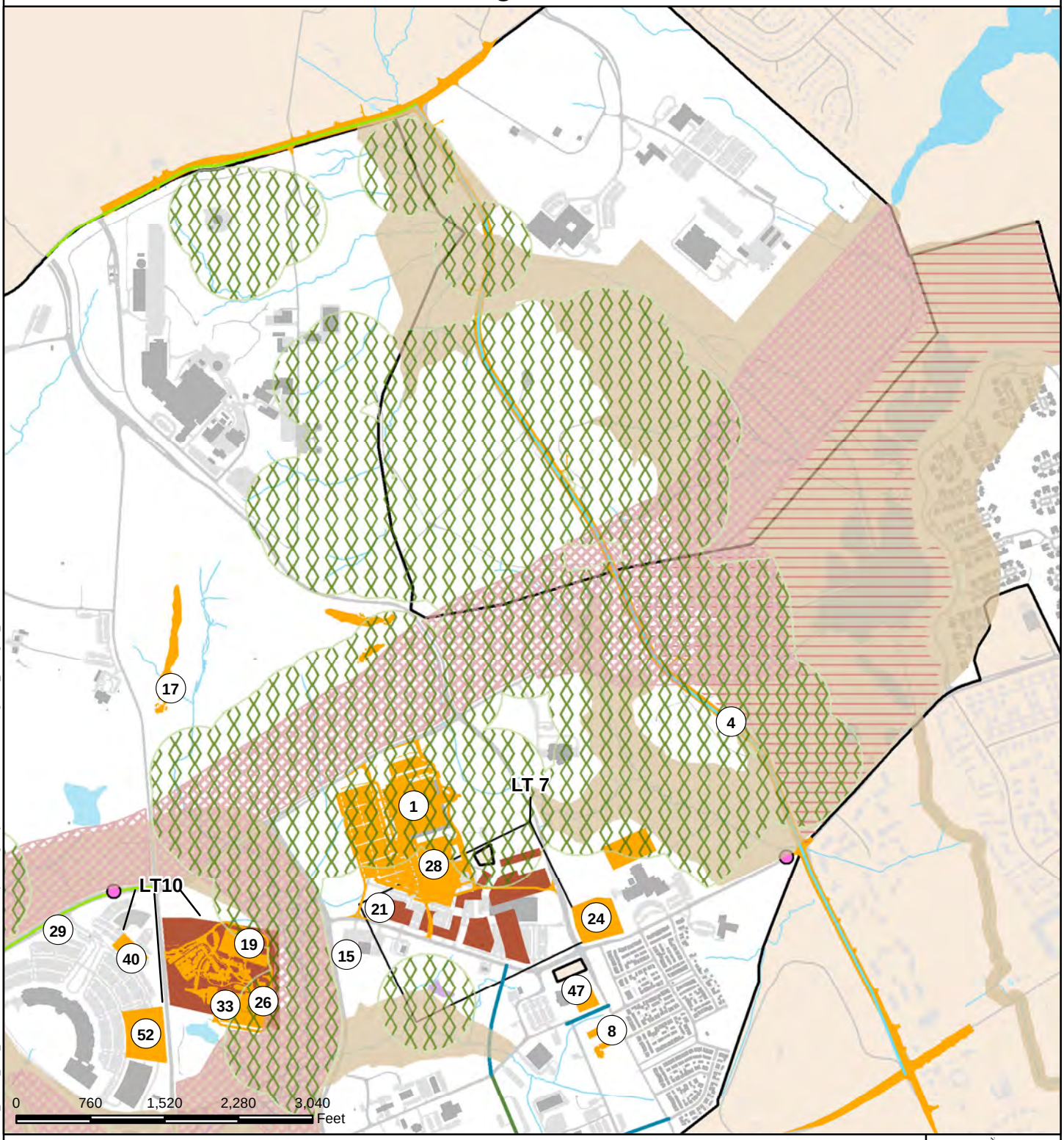
Ecologically Sensitive Resources - Mulligan Road



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New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

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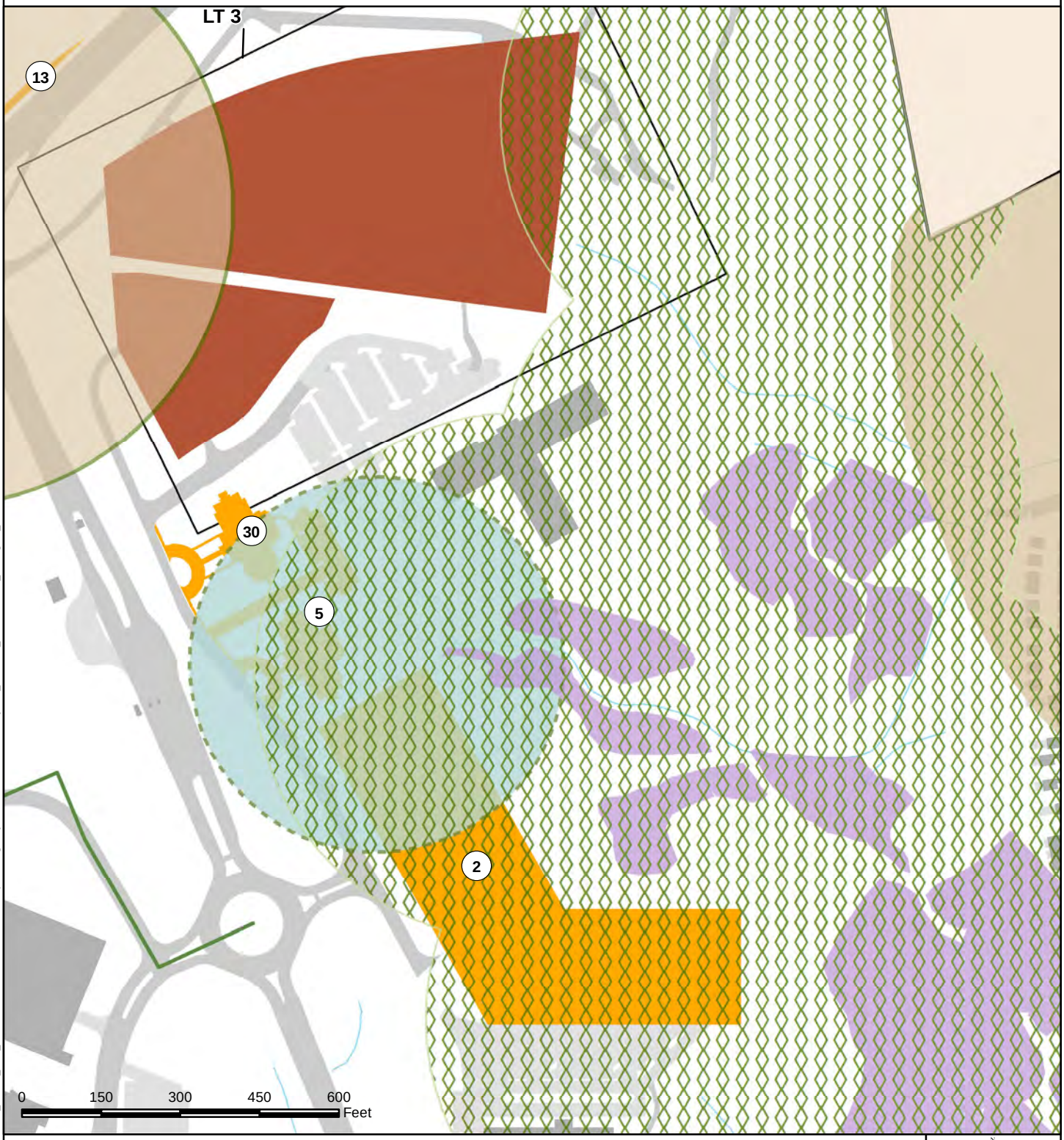
Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Ecologically Sensitive Resources\MulliganRd_Ecological_Resources.mxd

Ecologically Sensitive Resources - Grays Hill, PAL East of Belvoir Rd, Fisher House 1 & 2



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
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Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

Fort Belvoir RPMP EIS

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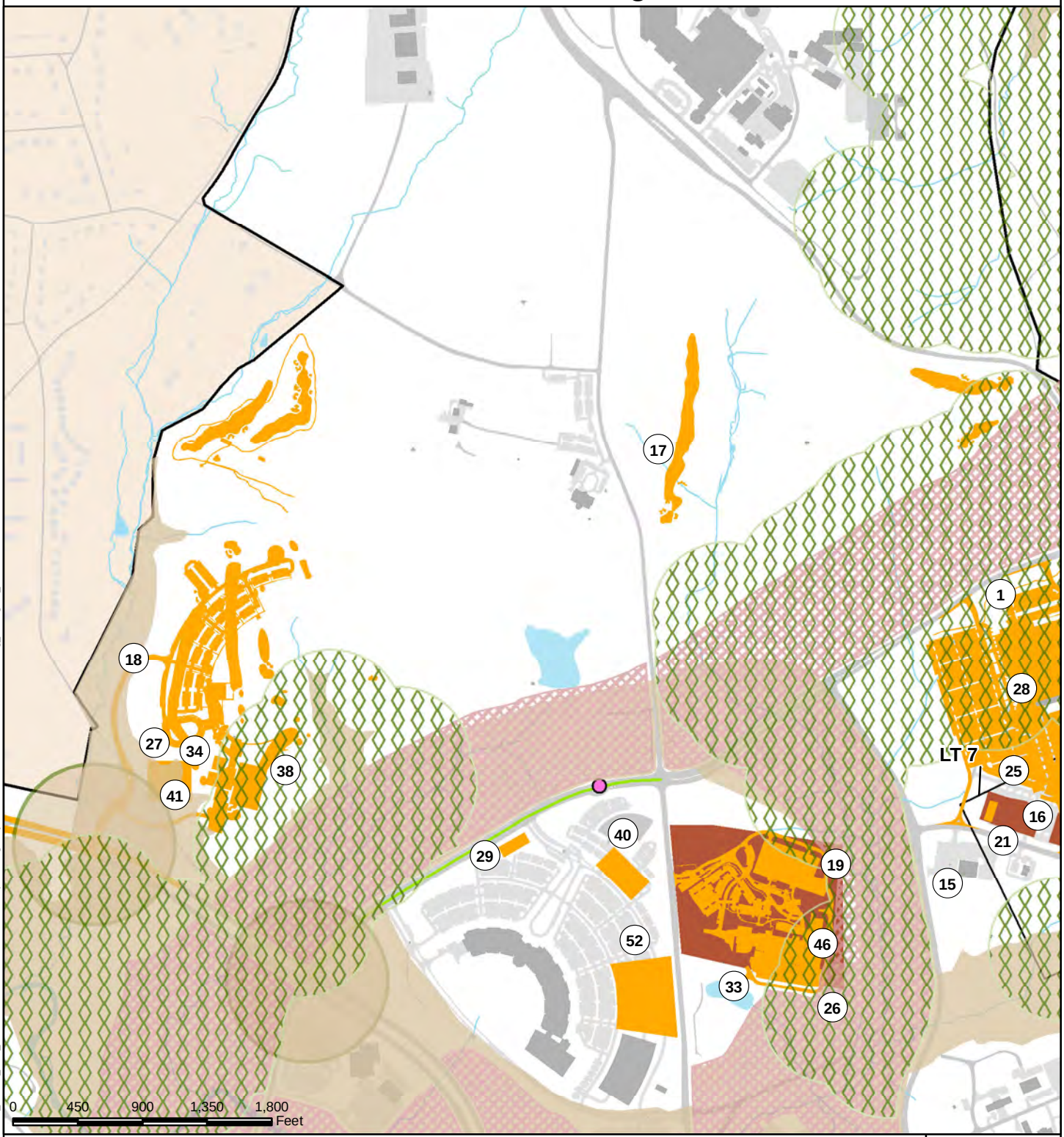
Ecologically Sensitive Resources - Golf Course Reconfiguration



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
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45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

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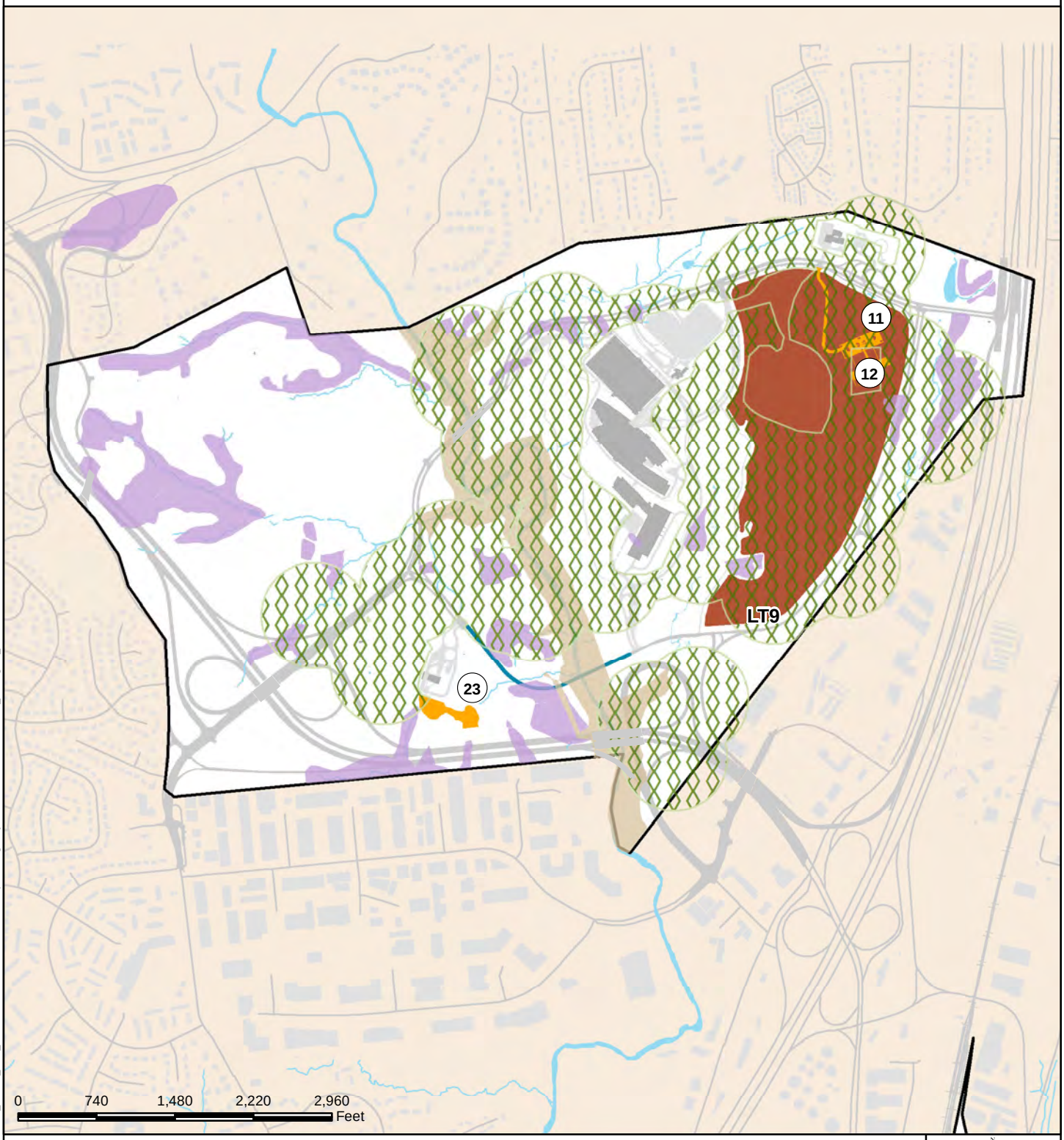
Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Ecologically Sensitive Resources\GolfCourseReconfig_Ecological_Resources.mxd

Ecologically Sensitive Resources - Fort Belvoir North Area



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
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Long-Term New Road
Short-Term Improved Road
Short-Term New Road
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Installation Boundary

Fort Belvoir RPMP EIS

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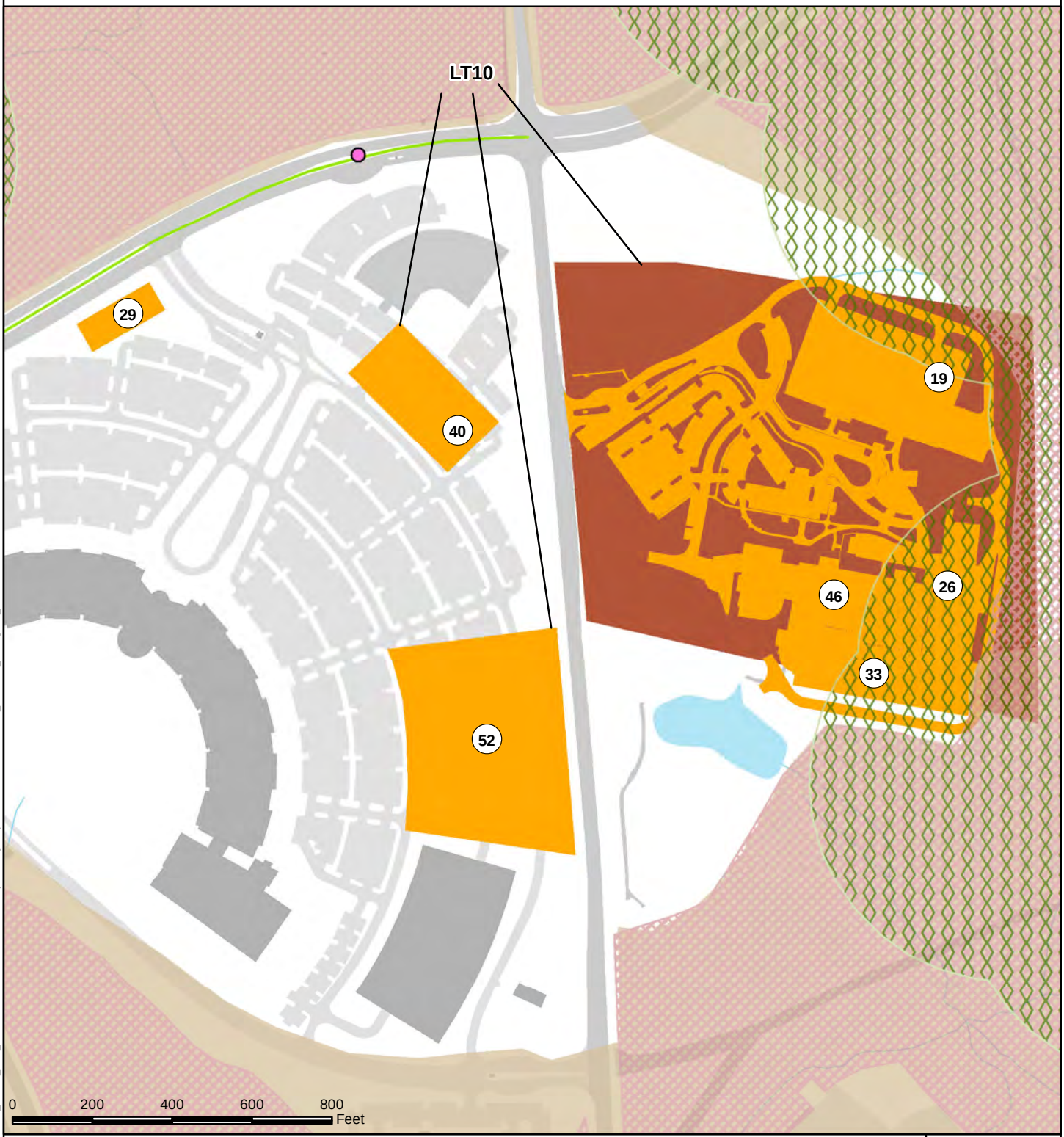
Ecologically Sensitive Resources - DLA & INSCOM



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
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LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

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Fort Belvoir RPMP EIS

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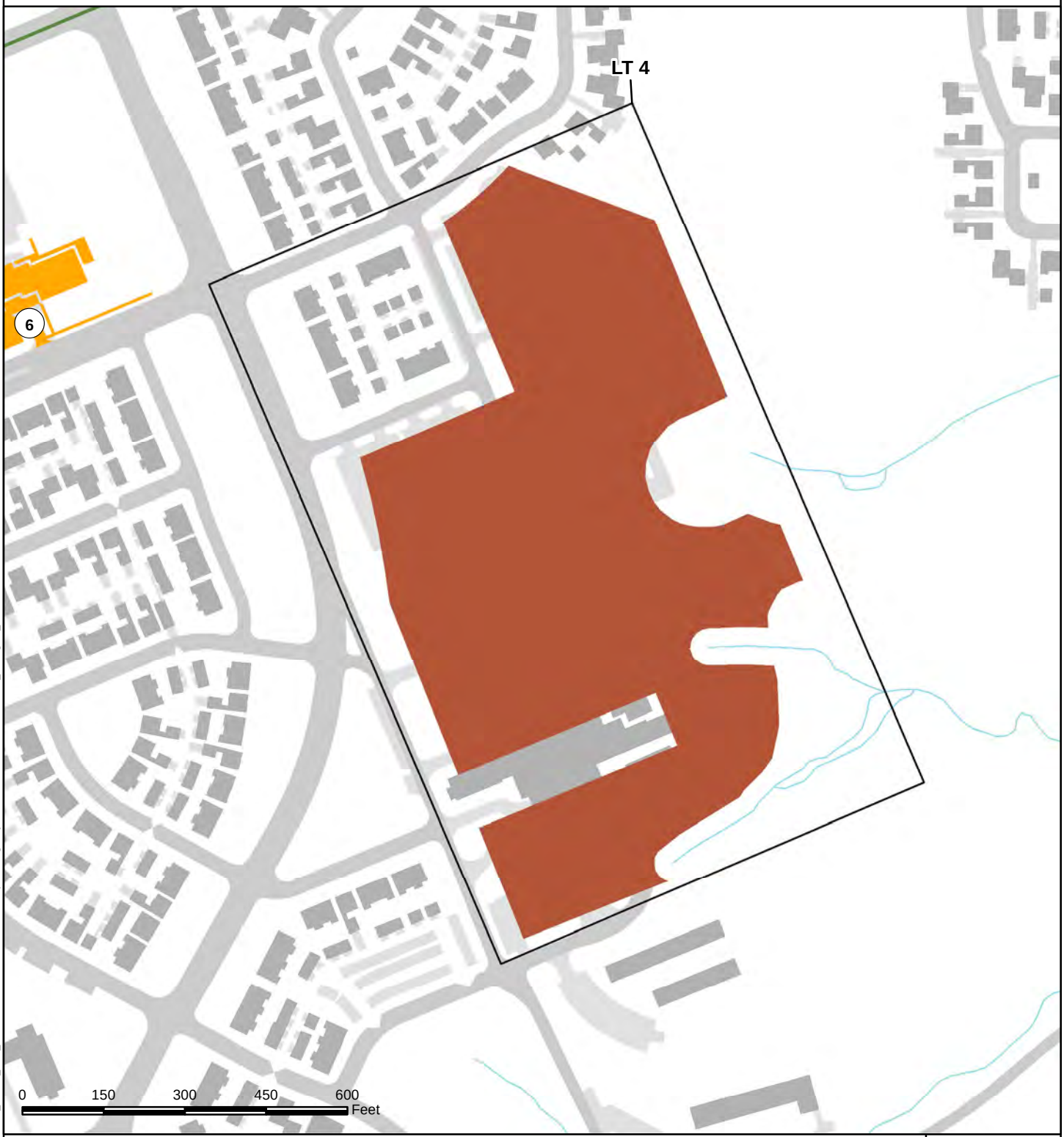
Ecologically Sensitive Resources - DeWitt Area



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
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Long-Term New Road
Short-Term Improved Road
Short-Term New Road
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LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

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Fort Belvoir RPMP EIS

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Ecologically Sensitive Resources - Davison Army Airfield

Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

Fort Belvoir RPMP EIS

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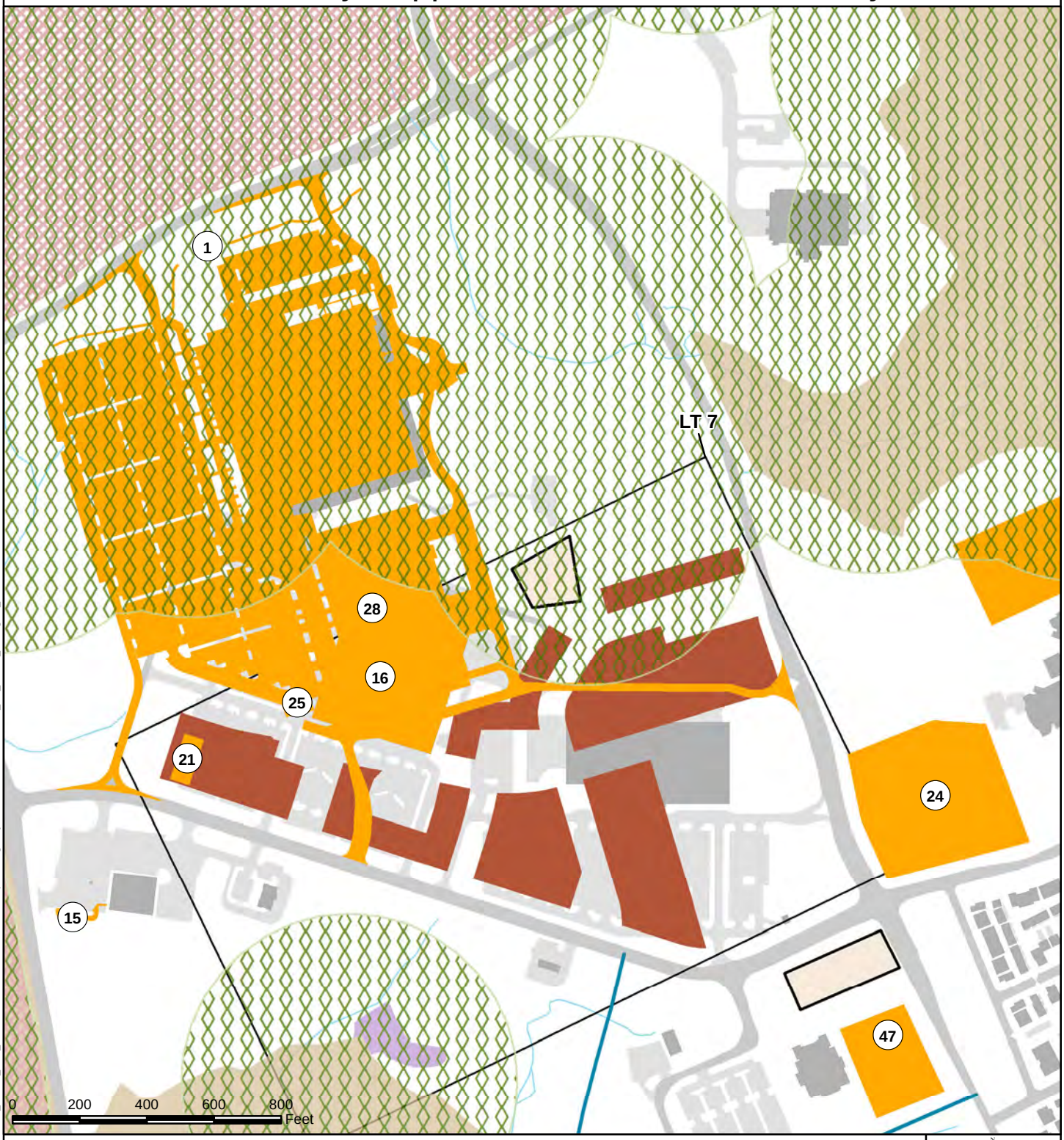
Ecologically Sensitive Resources - Community Support Center, PX, Commissary



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
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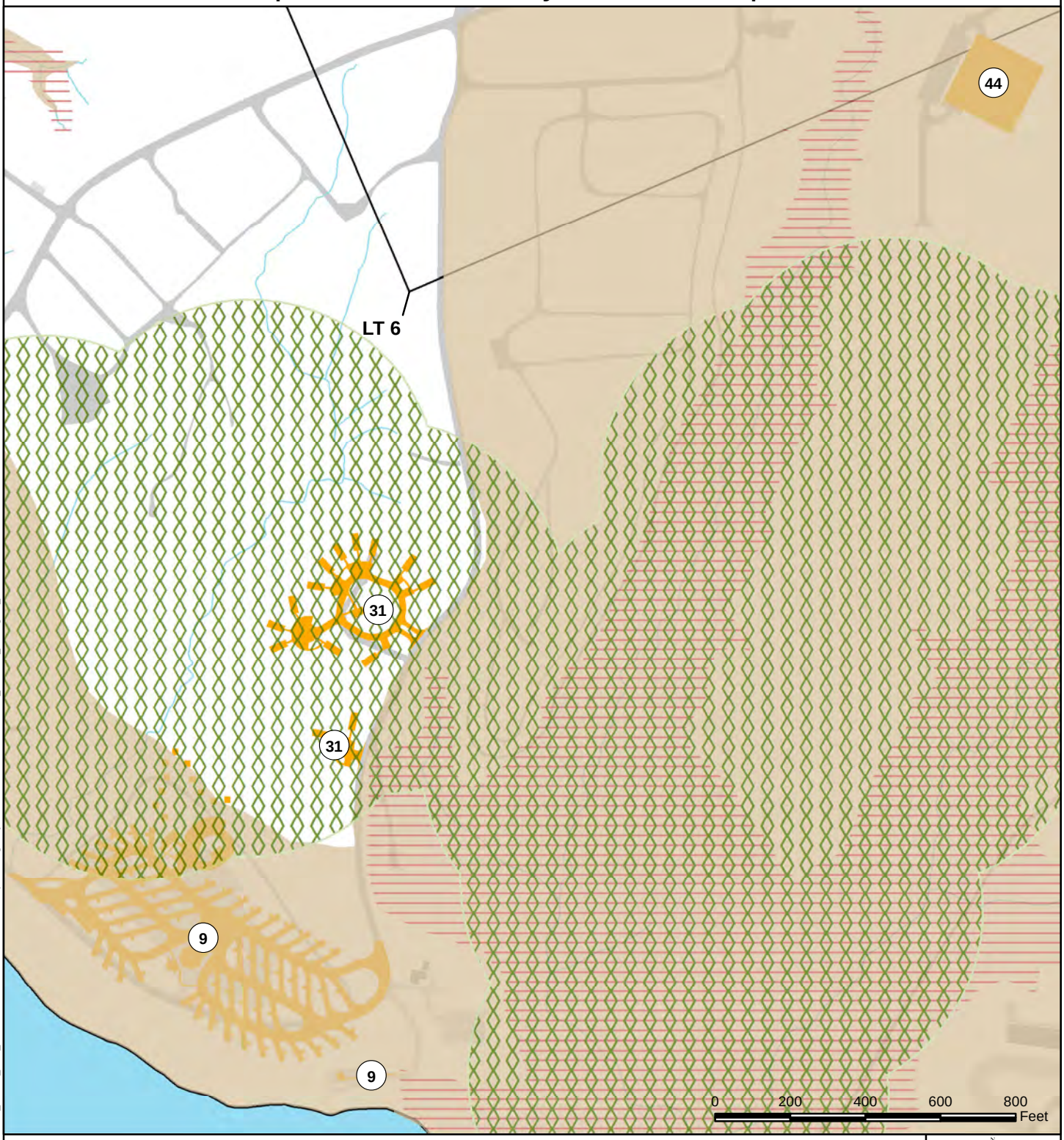
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Ecologically Sensitive Resources\CSC_PX_Comm_Ecological_Resources.mxd

Ecologically Sensitive Resources - Ballfield Replacement, Family Travel Camp Phase 1 & 2



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Ecologically Sensitive Resources\Ballfield_FTC1&2_Ecological_Resources.mxd

Ecologically Sensitive Resources - Gunston Road Office Area (1400 Area & Secure Admin Facility)

Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

N
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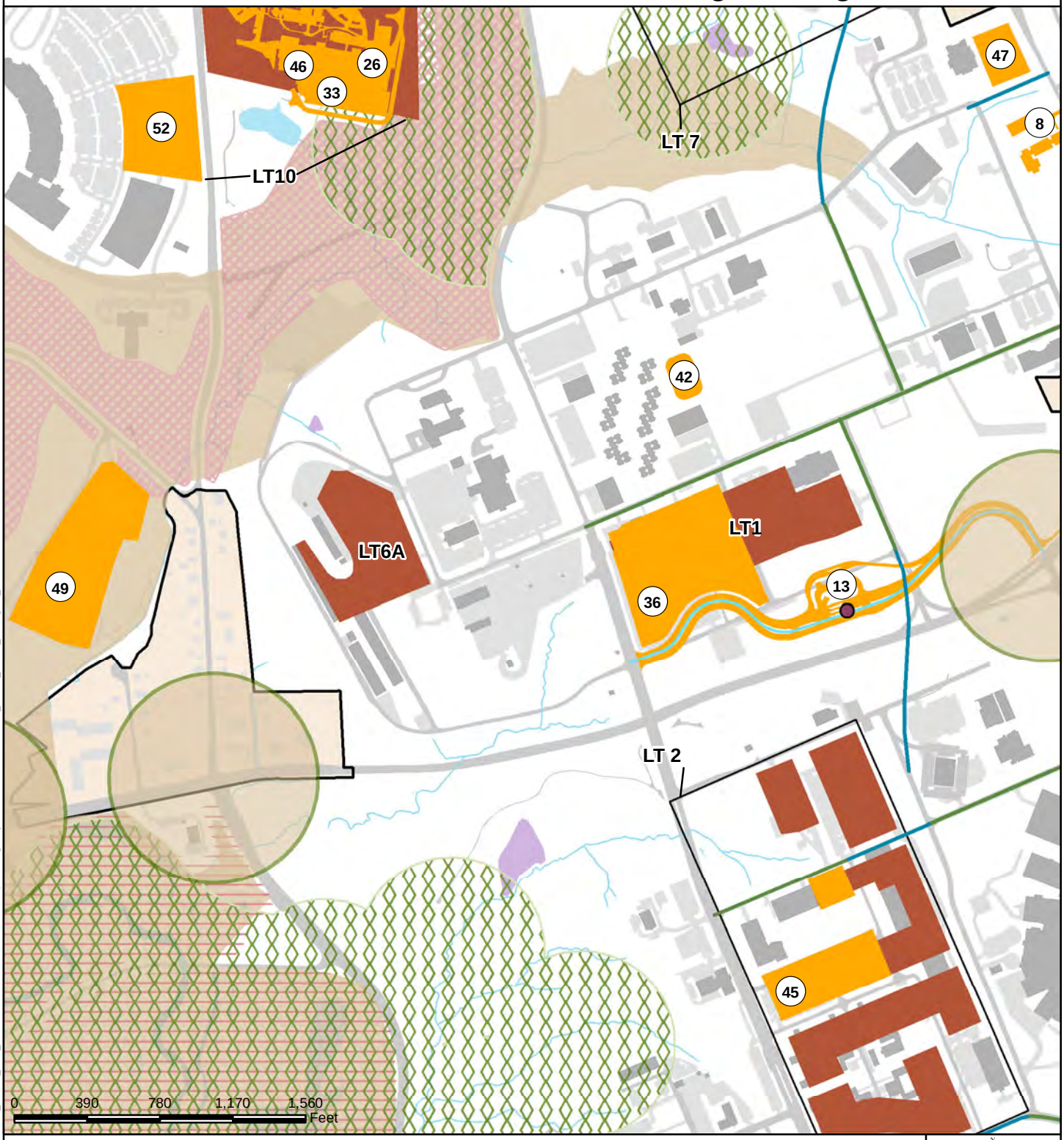
Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Ecologically Sensitive Resources\1400Area_Ecological_Resources.mxd

Ecologically Sensitive Resources - 29th Infantry HQ, Lieber Gate, OCAR Block, 911th Engineering Co.



Partners-in-Flight Buffer
Forest and Wildlife Corridor
Wildlife Refuge
Fauna Special Species Area
Flora Special Species Area
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

Fort Belvoir RPMP EIS

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APPENDIX G

GEOLOGY, TOPOGRAPHY, AND SOILS

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TABLE OF CONTENTS

Soils Small Area Maps G-1

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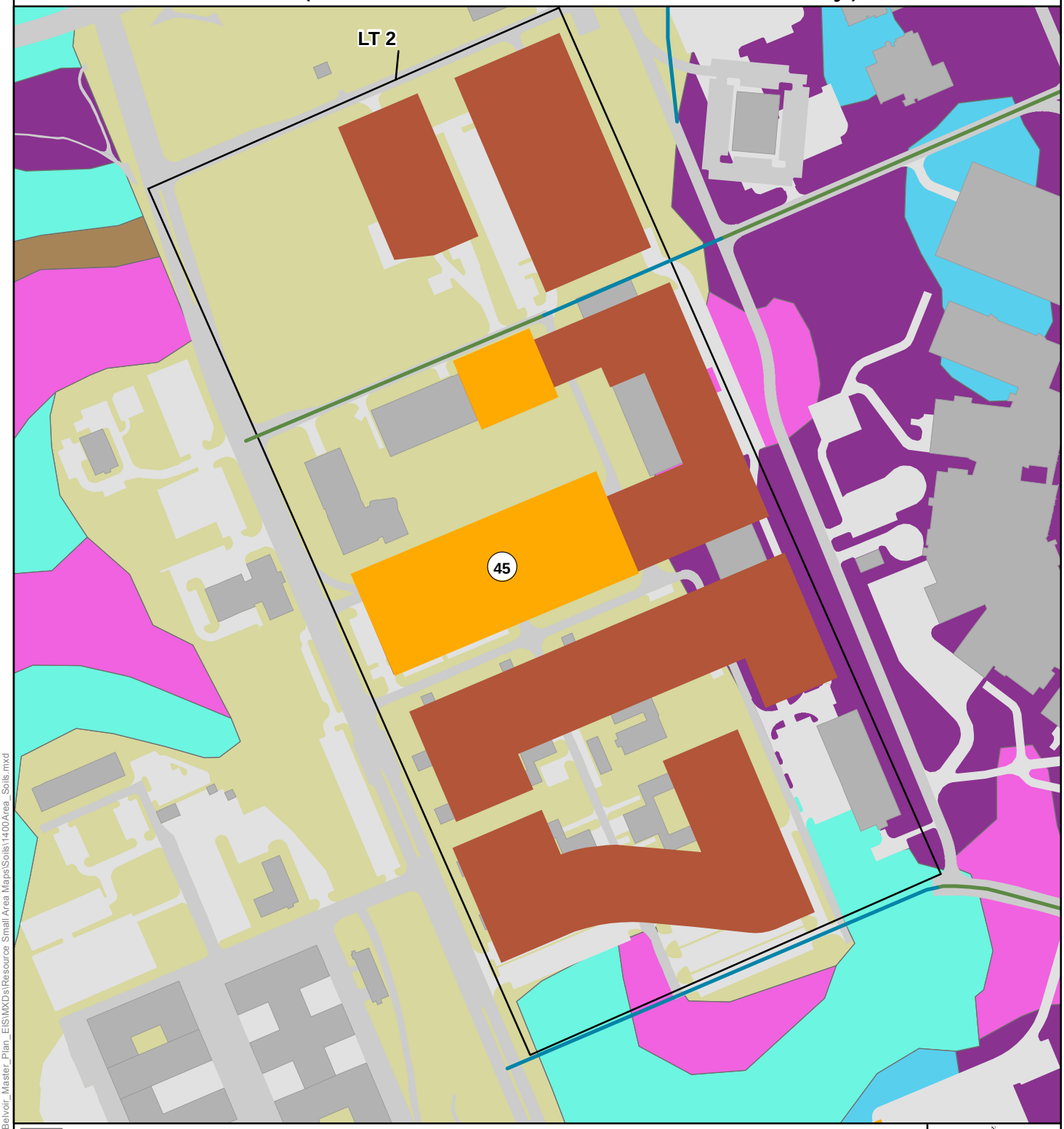
Soils - Gunston Road Office Area (1400 Area & Secure Admin Facility)



Beltsville Silt Loam
Hatboro Silt Loam
Matapeake Silt Loam
Mattapex Loam
Sassafras–Marumsco Complex
Urban Land

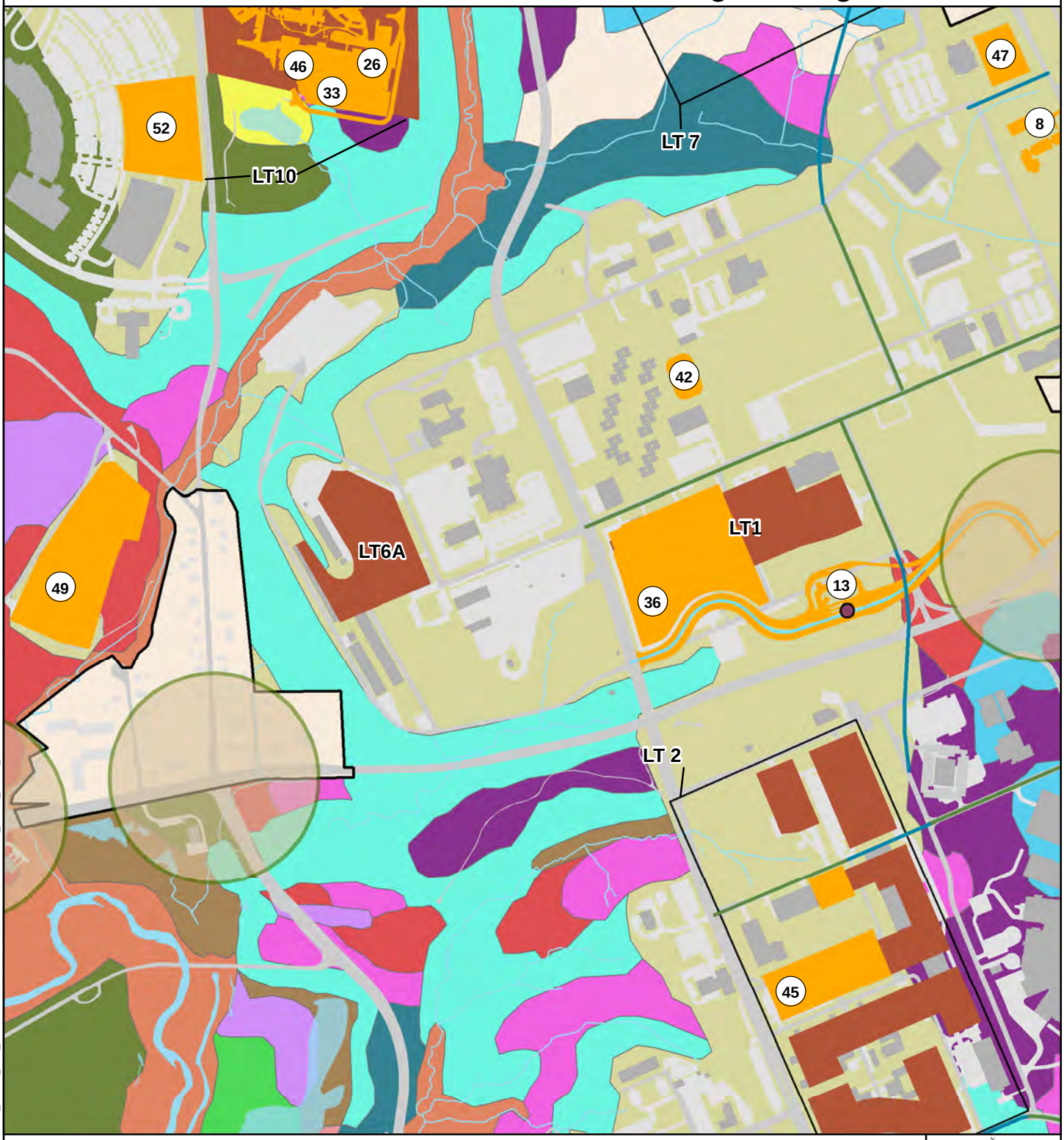
Long-Term Improved Road
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)

0 200 400 600 800 Feet

Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Soils\1400Area_Soils.mxd

Soils - 29th Infantry HQ, Lieber Gate, OCAR Block, 911th Engineering Co.



Beltsville Silt Loam
Codorus and Hatboro Soils
Downer Loamy Sand
Elkton Silt Loam
Grist Mill Sandy Loam
Gunston Silt Loam
Hatboro Silt Loam
Honga Peat
Matapeake Silt Loam
Mattapex Loam
Pits, Gravel
Sassafras–Marumsco Complex
Sassafras–Neabsco Complex
Urban Land
Woodstown Sandy Loam
New ACP (2017)
Long-Term Improved Road
Long-Term New Road
Short-Term New Road
Long-Term Intersection Improvements
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 400 800 1,200 1,600 Feet

N
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Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resources Small Area Maps\Soils\29th_OCAR_Lieber_Soils.mxd

Soils -
Ballfield Replacement, Family Travel Camp Phase 1 & 2

Beltsville Silt Loam
Codorus and Hatboro Soils
Grist Mill Sandy Loam
Gunston Silt Loam
Matapeake Silt Loam
Mattapex Loam
Sassafras–Marumsco Complex
Sassafras Sandy Loam
Urban Land
Water
Woodstown Sandy Loam
Transit Transfer Center
New ACP (2017)
New ACP (2030)
Long-Term Intersection Improvements
Near-Term Intersection Improvements
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

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Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Soils\Ballfield_FTC1&2_Soils.mxd

Soils -
Community Support Center, PX, Commissary

Beltsville Silt Loam
Codorus and Hatboro Soils
Grist Mill Sandy Loam
Gunston Silt Loam
Matapeake Silt Loam
Mattapex Loam
Sassafras–Marumsco Complex
Sassafras Sandy Loam
Urban Land
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 200 400 600 800 Feet

N
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Fort Belvoir RPMP EIS

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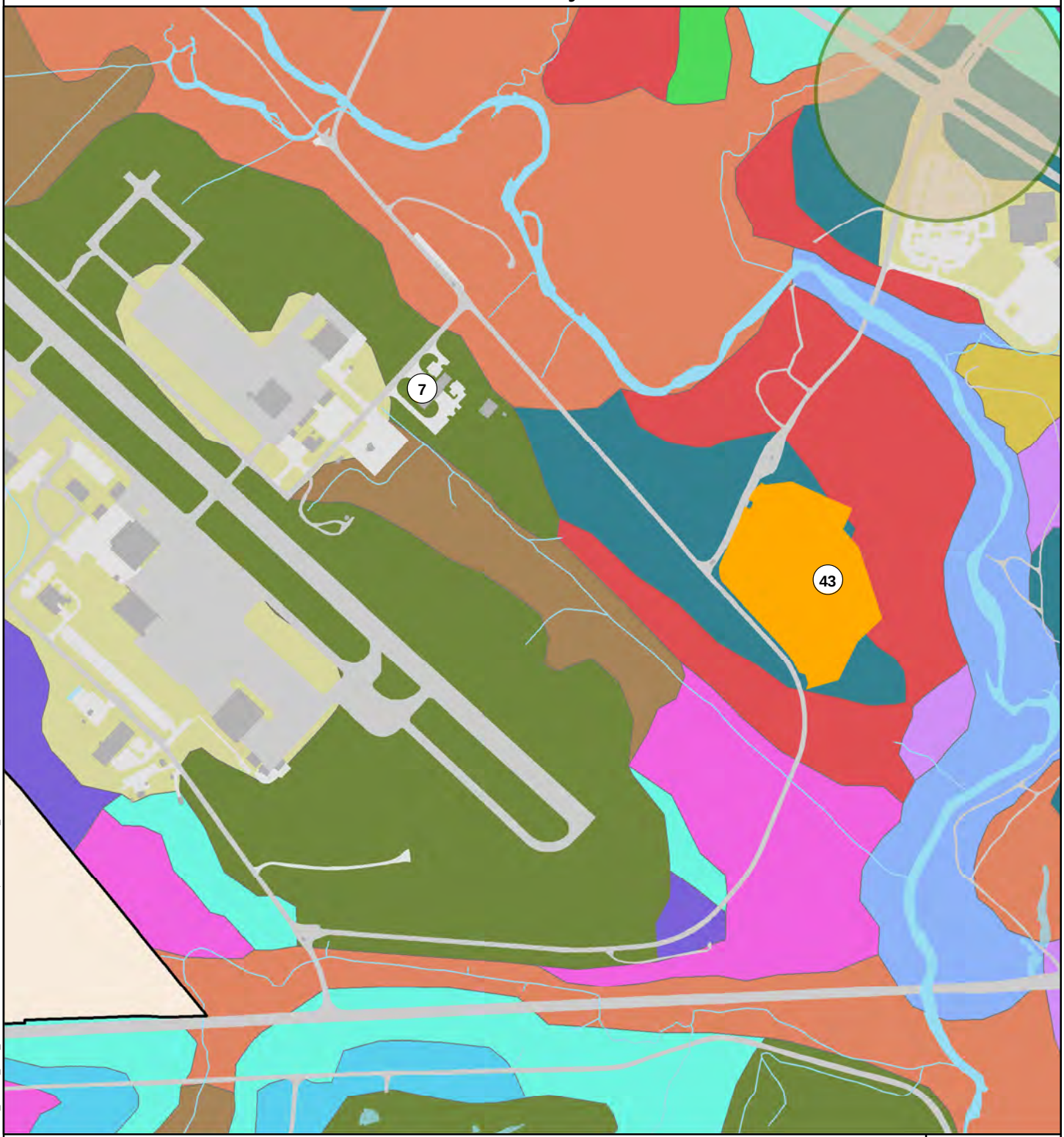
Soils -
Davison Army Airfield



Beltsville Silt Loam
Codorus Silt Loam
Codorus and Hatboro Soils
Downer Loamy Sand
Elkton Silt Loam
Grist Mill Sandy Loam
Gunston Silt Loam
Hatboro Silt Loam
Lunt–Marumsco Complex
Matapeake Silt Loam
Mattapex Loam
Sassafras–Marumsco Complex
Sassafras Sandy Loam
Urban Land
Woodstown Sandy Loam
Long-Term Intersection Improvements
45 Short-Term Project Sites (Construction FY 2012 - 2017)
Installation Boundary

0 350 700 1,050 1,400 Feet

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Fort Belvoir RPMP EIS

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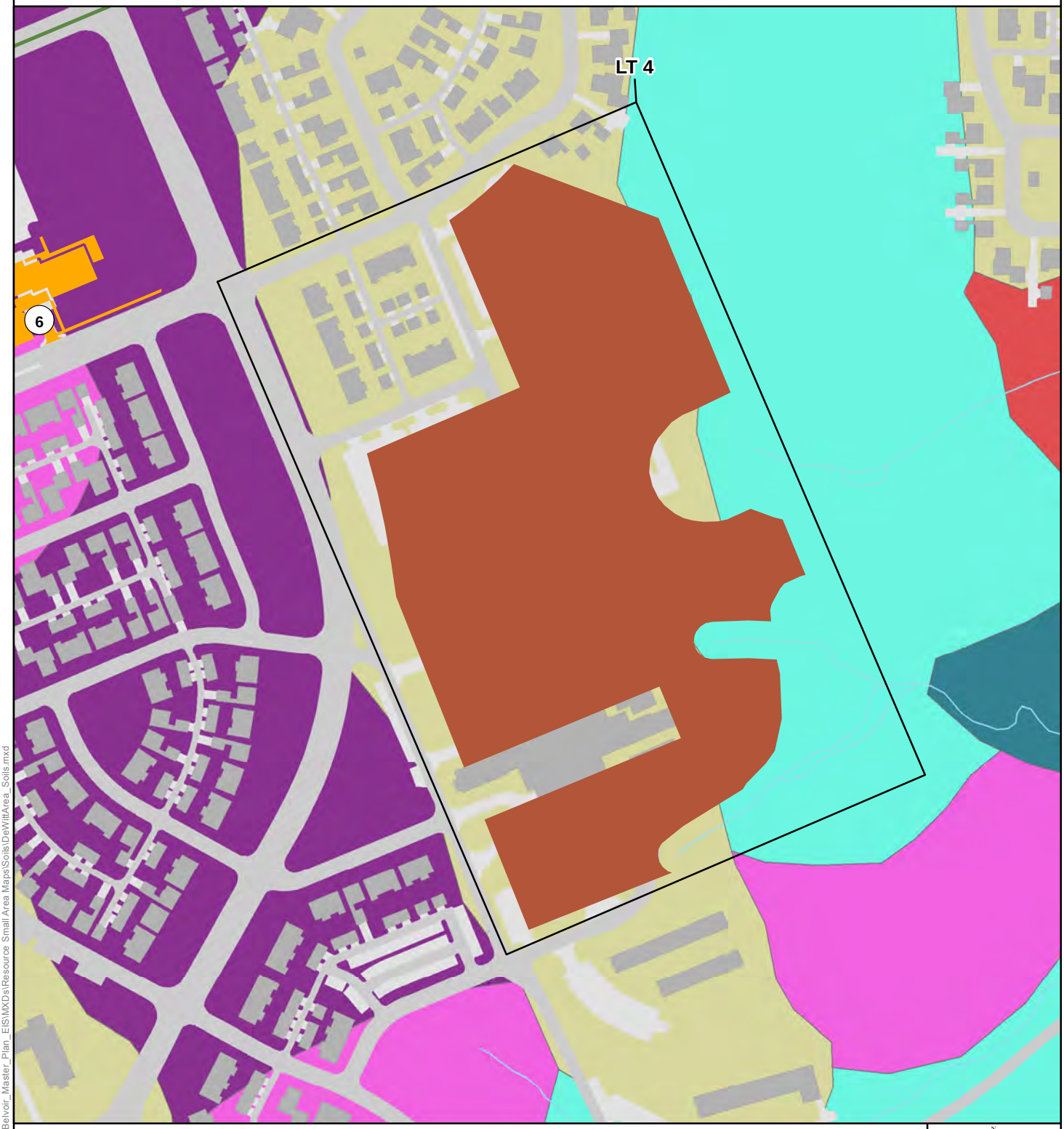
Soils -
DeWitt Area



Beltsville Silt Loam
Gunston Silt Loam
Mattapex Loam
Sassafras–Marumsco Complex
Urban Land
Woodstown Sandy Loam
Long-Term Improved Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)

0 150 300 450 600 Feet

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Fort Belvoir RPMP EIS

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Soils - DLA & INSCOM

Beltsville Silt Loam
Codorus and Hatboro Soils
Elkton Silt Loam
Grist Mill Sandy Loam
Gunston Silt Loam
Mattapex Loam
Pits, Gravel
Sassafras–Marumsco Complex
Sassafras Sandy Loam
Urban Land
Woodstown Sandy Loam
New ACP (2030)
Short-Term Improved Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)

0 200 400 600 800 Feet

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Fort Belvoir RPMP EIS

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Soils -
Fort Belvoir North Area

Barkers Crossroads–Rhodhiss Complex
Beltsville Silt Loam
Codorus and Hatboro Soils
Fairfax Loam
Glenelg Silt Loam
Kingstowne–Sassafras Complex
Kingstowne Sandy Clay Loam
Matapeake Silt Loam
Meadowville Loam
Nathalie Gravelly Loam
Pits, Gravel
Rhodhiss–Rock Outcrop Complex
Rhodhiss Sandy Loam
Sassafras–Marumsco Complex
Sassafras–Neabsco Complex
Sassafras Sandy Loam
Urban Land
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 750 1,500 2,250 3,000 Feet

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Fort Belvoir RPMP EIS

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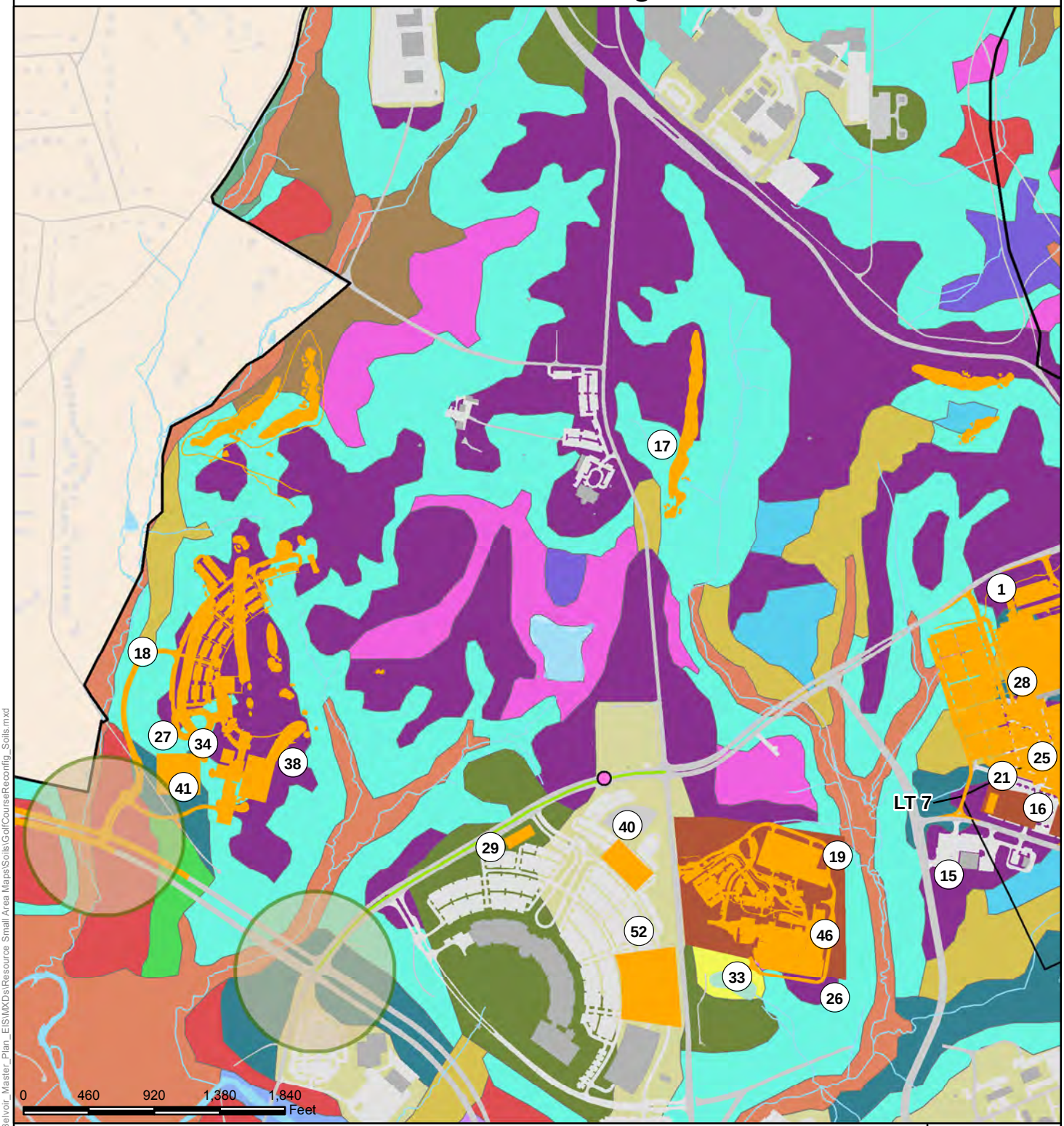
Soils-
Golf Course Reconfiguration



Beltsville Silt Loam
Codorus Silt Loam
Codorus and Hatboro Soils
Downer Loamy Sand
Elkton Silt Loam
Grist Mill Sandy Loam
Gunston Silt Loam
Hatboro Silt Loam
Kingstowne–Sassafras -Neabsco Complex
Lunt–Marumsco Complex
Matapeake Silt Loam
Mattapex Loam
Meadowville Loam
Pits, Gravel
Sassafras–Marumsco Complex
Sassafras Sandy Loam
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Water
Woodstown Sandy Loam
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Fort Belvoir RPMP EIS

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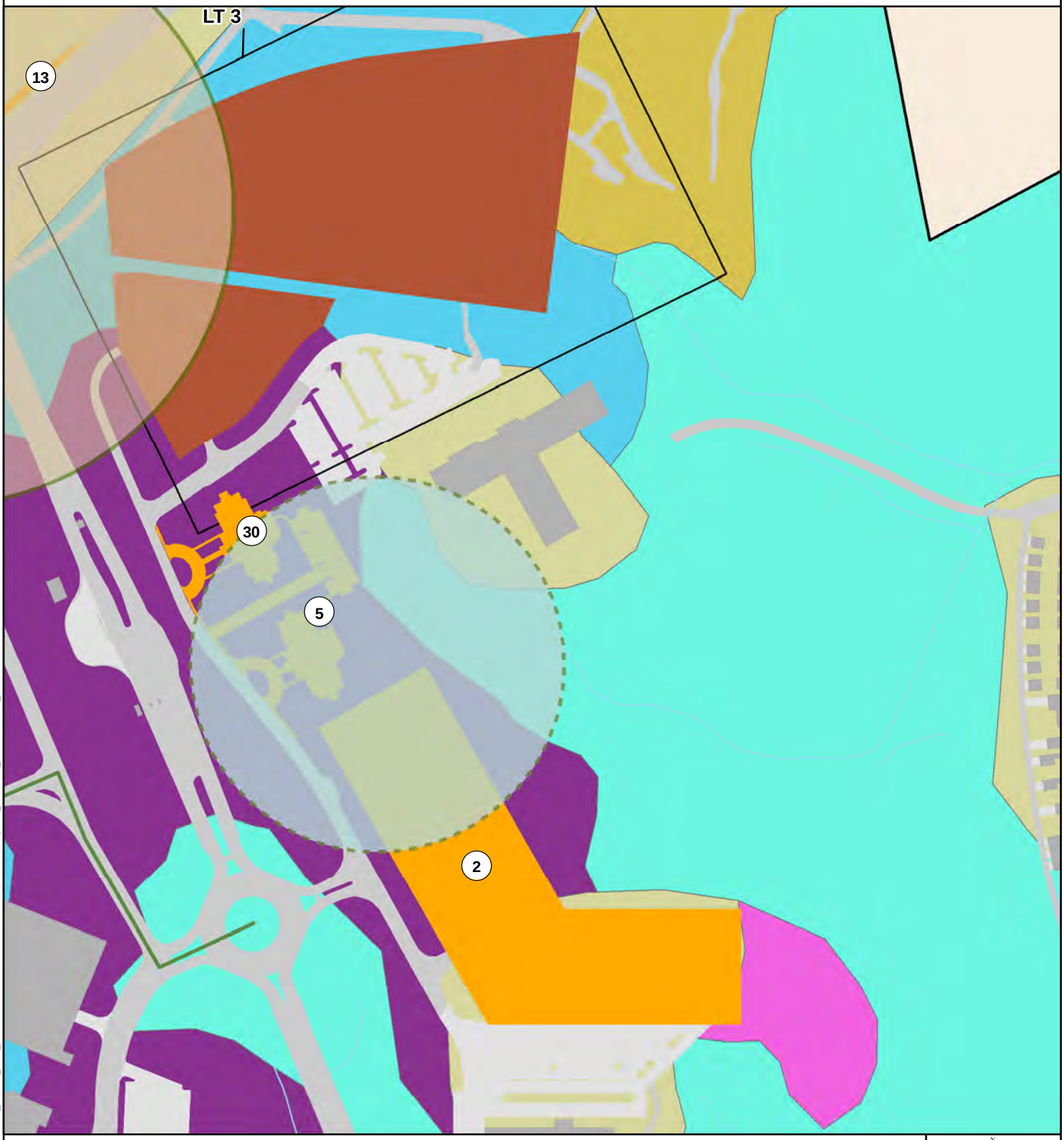
Soils - Grays Hill, PAL East of Belvoir Rd, Fisher House 1 & 2



Beltsville Silt Loam
Matapeake Silt Loam
Mattapex Loam
Sassafras - Marumsco Complex
Sassafras Sandy Loam
Urban Land

Long-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 150 300 450 600 Feet

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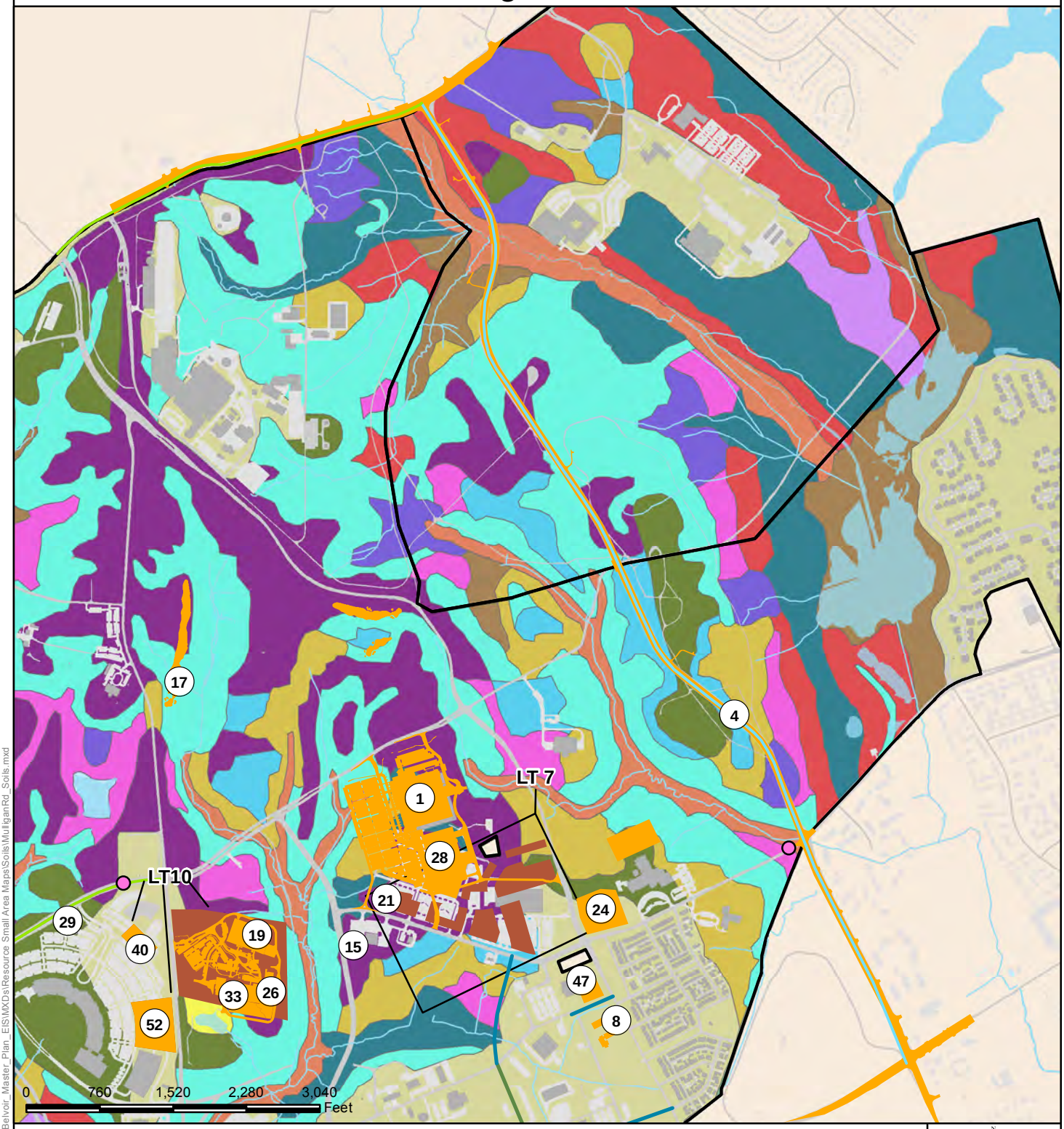
Fort Belvoir RPMP EIS

Path: L:_Common\GIS_Data\60224984_Belvoir_Master_Plan_EIS\MXDs\Resource Small Area Maps\Soils\GraysHill_PALEOB_FisherHouses_Soils.mxd

Soils - Mulligan Road



Beltsville Silt Loam
Codorus and Hatboro Soils
Elkton Silt Loam
Grist Mill–Mattapex Complex
Grist Mill Sandy Loam
Gunston Silt Loam
Hatboro Silt Loam
Kingstowne–Sassafras-Neabsco Complex
Lunt–Marumsco Complex
Matapeake Silt Loam
Mattapex Loam
Pits, Gravel
Sassafras–Marumsco Complex
Sassafras Sandy Loam
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Water
Woodstown Sandy Loam
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Long-Term New Road
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Fort Belvoir RPMP EIS

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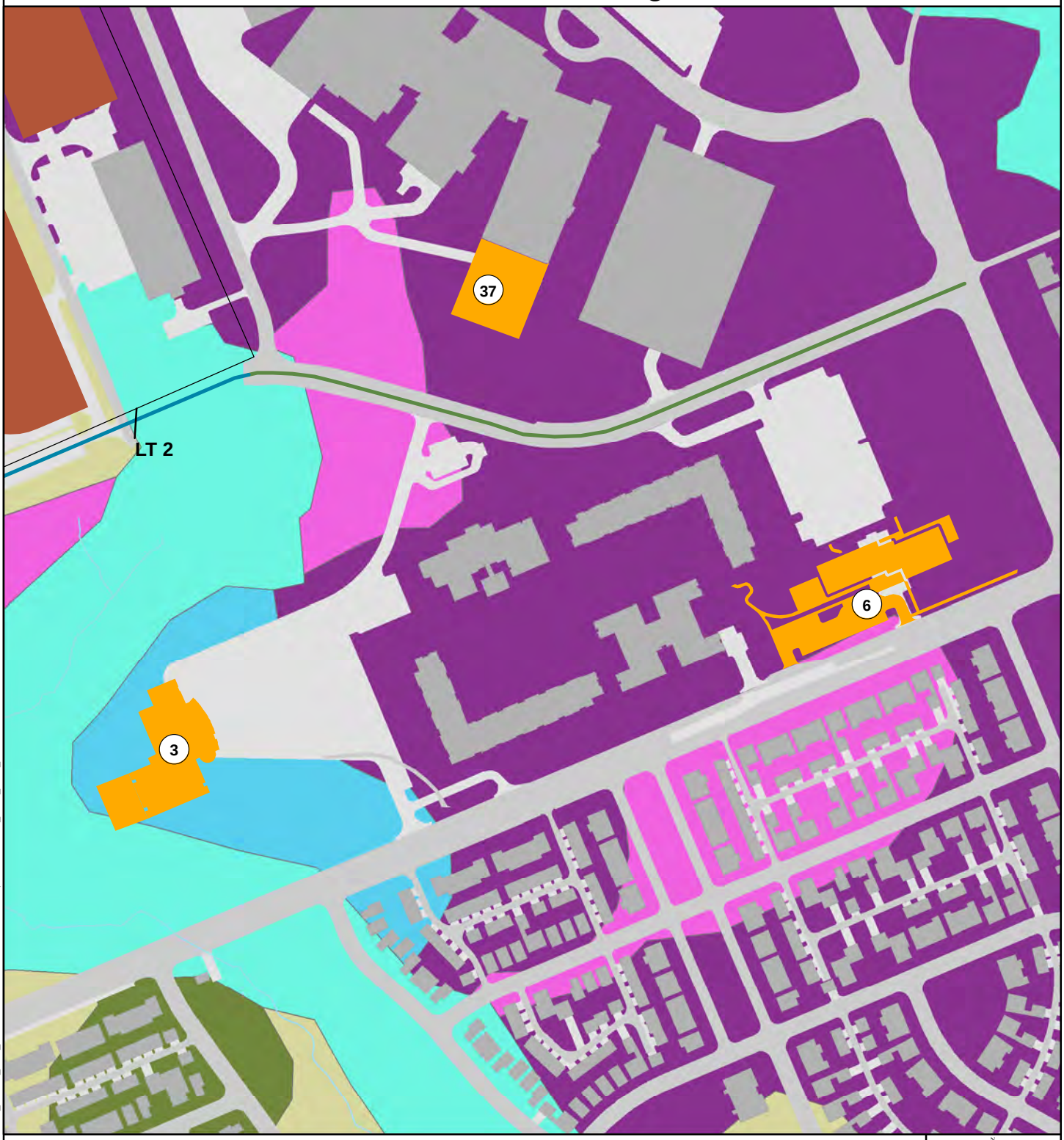
Soils - NICoE, Medical Office Building, USO



Beltsville Silt Loam
Grist Mill Sandy Loam
Matapeake Silt Loam
Mattapex Loam
Sassafras - Marumsco Complex
Urban Land

Long-Term Improved Road
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)

0 150 300 450 600 Feet

N
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Fort Belvoir RPMP EIS

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Soils -
NMUSA & Golf Course Reconfiguration

Beltsville Silt Loam
Codorus and Hatboro Soils
Downer Loamy Sand
Grist Mill Sandy Loam
Gunston Silt Loam
Hatboro Silt Loam
Kingstowne–Sassafras -Neabsco Complex
Mattapex Loam
Sassafras–Marumsco Complex
Sassafras Sandy Loam
Woodstown Sandy Loam
Long-Term Intersection Improvements
45 Short-Term Project Sites (Construction FY 2012 - 2017)
Installation Boundary

0 250 500 750 1,000 Feet

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W E
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Fort Belvoir RPMP EIS

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Soils -
Religious Education Center, CDC 144

Beltsville Silt Loam
Grist Mill Sandy Loam
Matapeake Silt Loam
Sassafras Sandy Loam
Urban Land

Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)

0 125 250 375 500 Feet

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Fort Belvoir RPMP EIS

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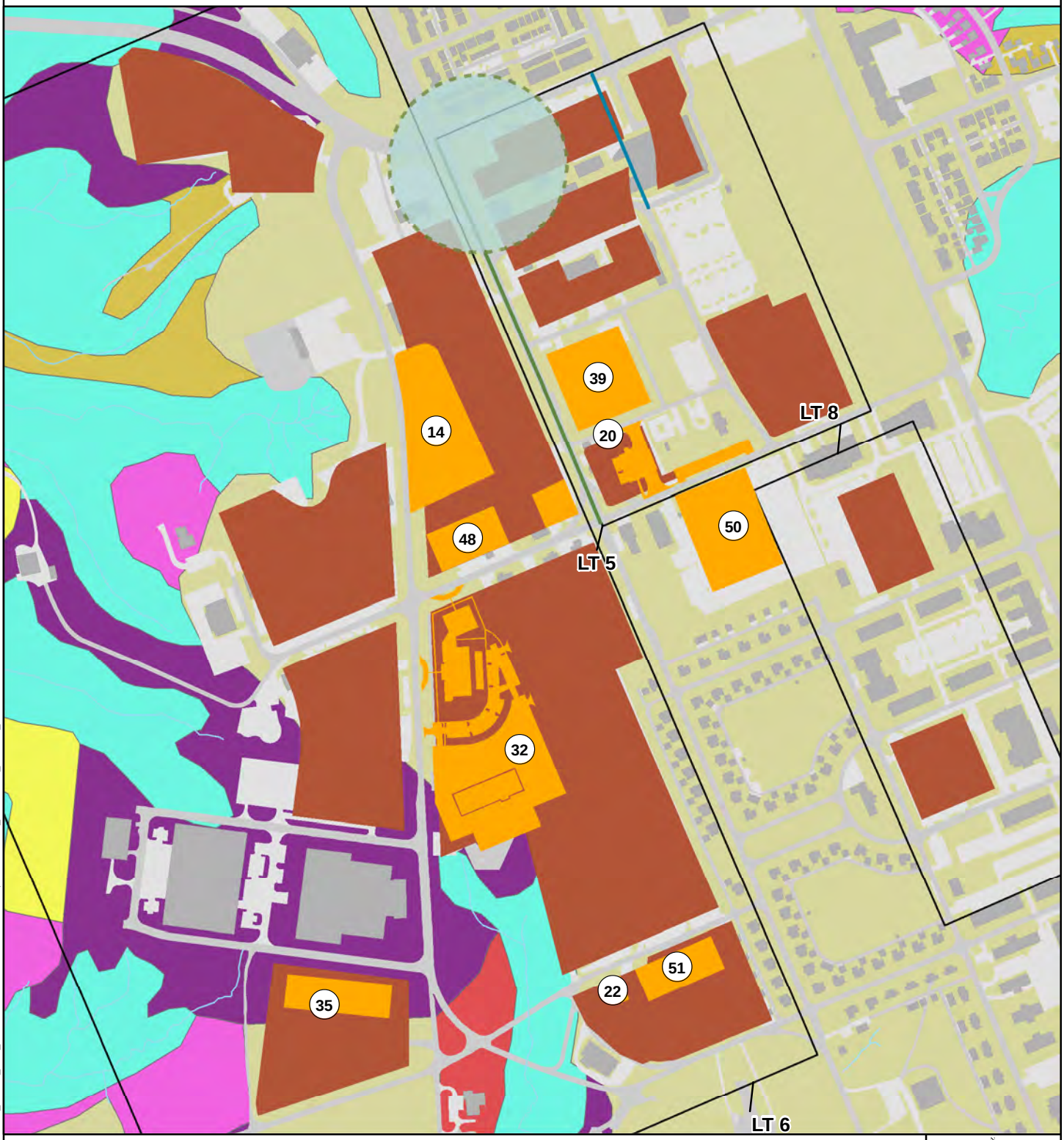
Soils - South Post Town Center, Industrial Area, 200 Area



Beltsville Silt Loam
Mattapex Loam
Pits, Gravel
Sassafras - Marumsco Complex
Sassafras Sandy Loam
Urban Land
Woodstown Sandy Loam
Transit Transfer Center
Long-Term Improved Road
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)

0 250 500 750 1,000 Feet

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Fort Belvoir RPMP EIS

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APPENDIX H
HAZARDOUS SUBSTANCES AND HAZARDOUS MATERIALS

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TABLE OF CONTENTS

Hazardous Substances and Hazardous Materials Small Area Maps..... H-1

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Hazardous Substance and Hazardous Materials - Gunston Road Office Area (1400 Area & Secure Admin Facility)

Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Long-Term Improved Road
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 340 680
Feet

Fort Belvoir RPMP EIS

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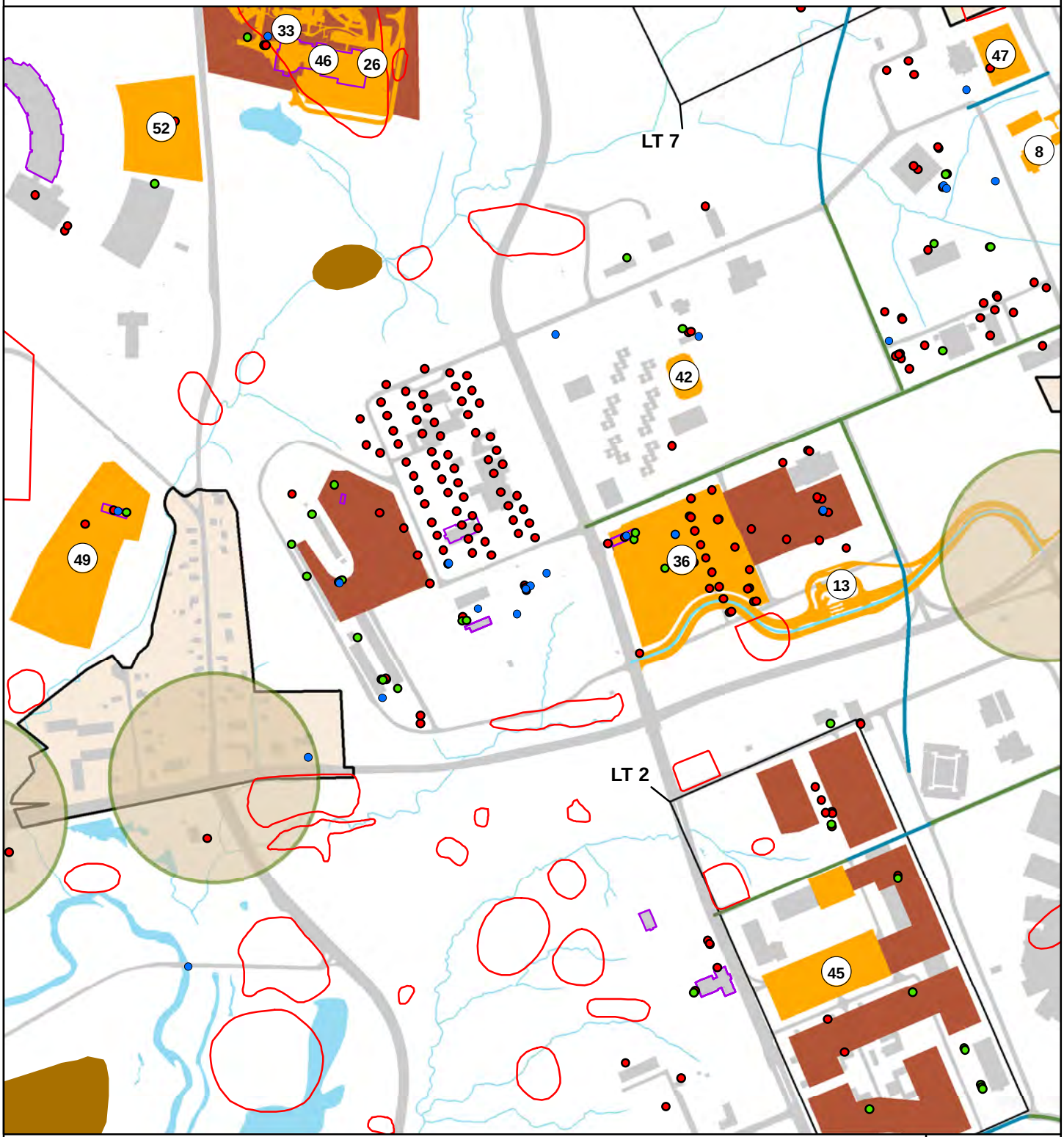
Hazardous Substance and Hazardous Materials - 29th Infantry HQ, Lieber Gate, OCAR Block, 911th Engineering Co.



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Former Landfill
Long-Term Improved Road
Long-Term New Road
Short-Term New Road
Long-Term Intersection Improvements
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 755 1,510 Feet

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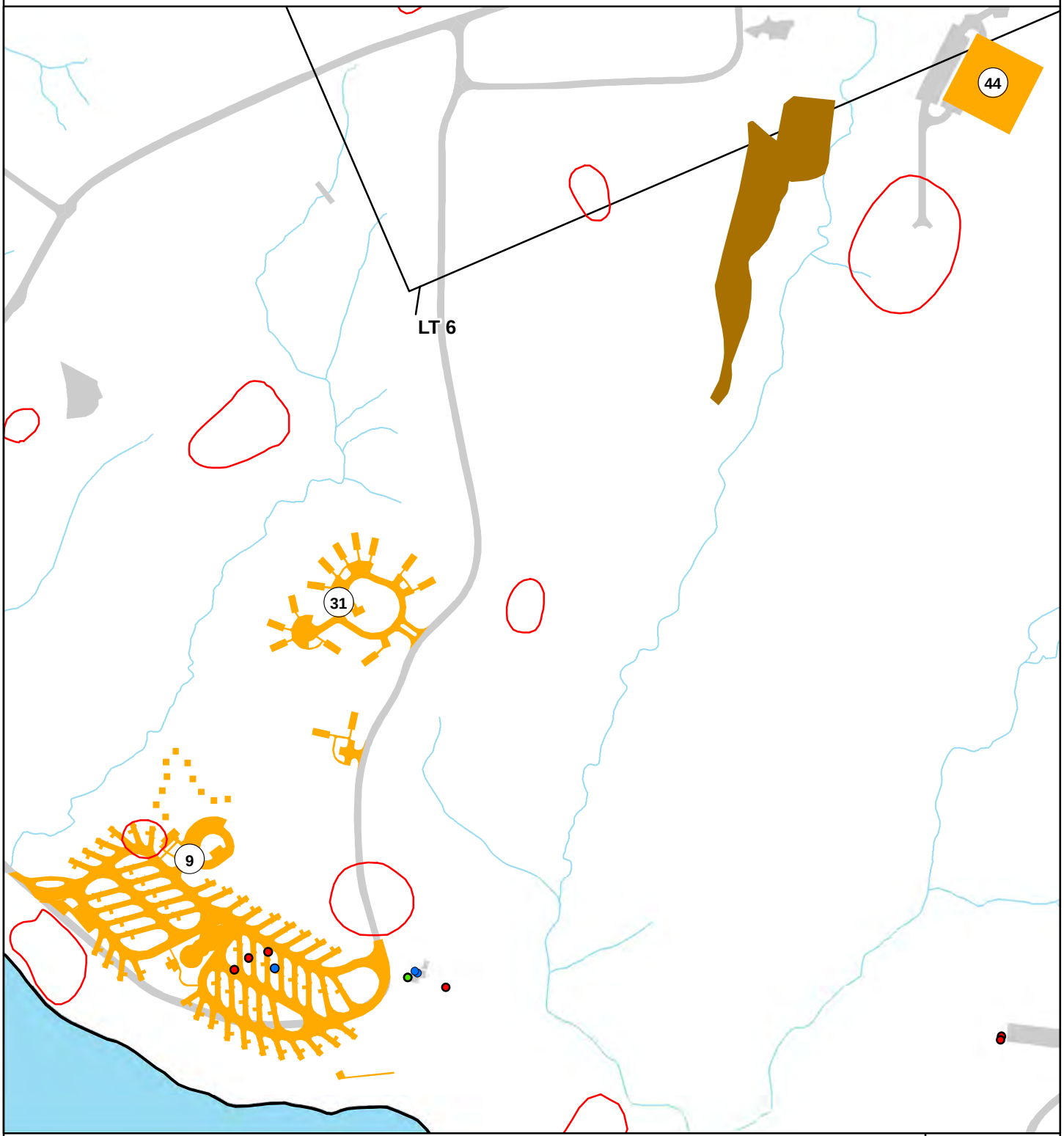
Hazardous Substance and Hazardous Materials - Ballfield Replacement, Family Travel Camp Phase 1 & 2



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Hazardous Substance and Hazardous Materials - Community Support Center, PX, Commissary

Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Former Landfill
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 420 840 Feet

N W E S

Fort Belvoir RPMP EIS

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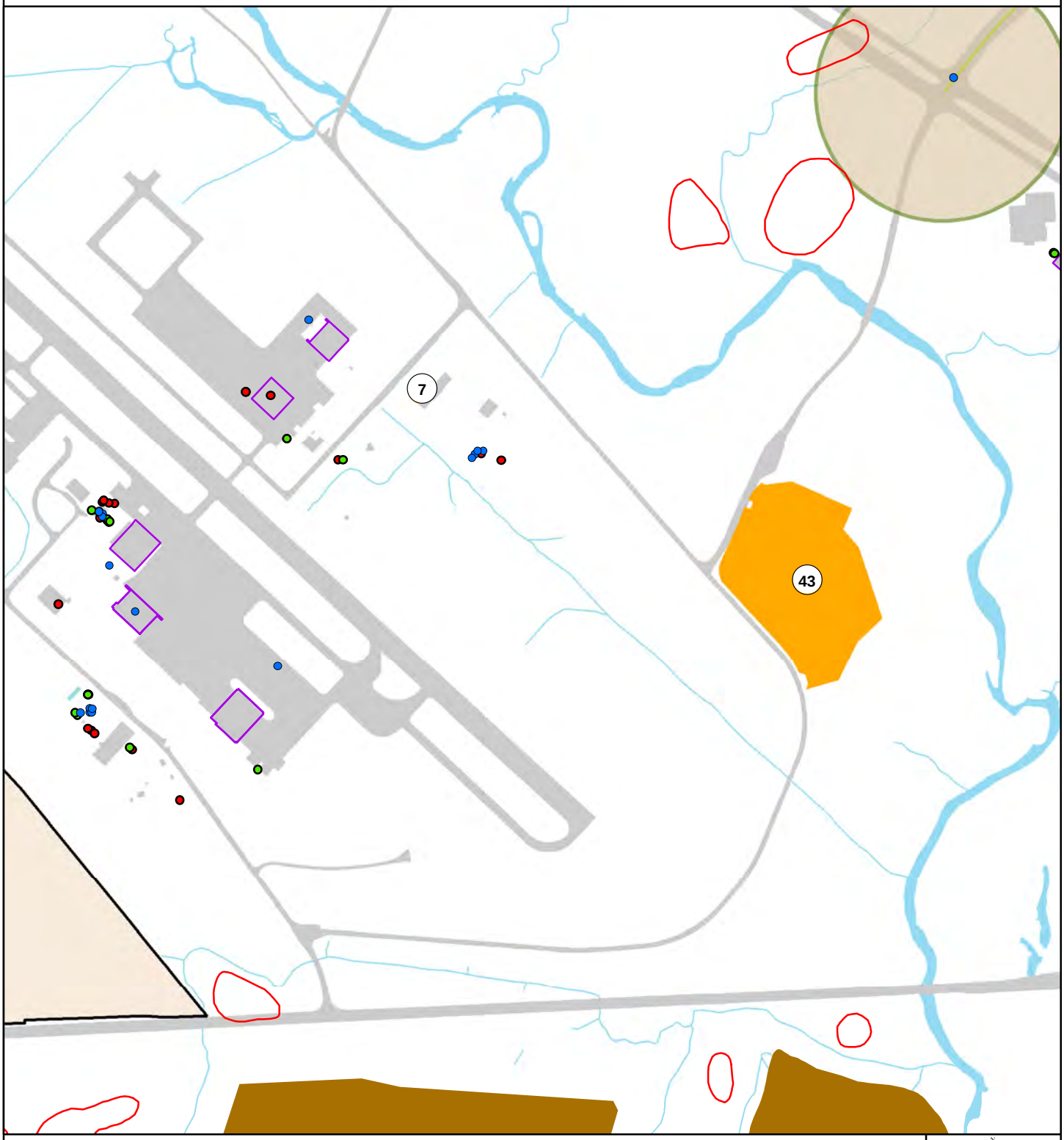
Hazardous Substance and Hazardous Materials - Davison Army Airfield



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Former Landfill
Short-Term Improved Road
Long-Term Intersection Improvements
Near-Term Intersection Improvements
45 Short-Term Project Sites (Construction FY 2012 - 2017)
Installation Boundary

0 620 1,240 Feet

Fort Belvoir RPMP EIS

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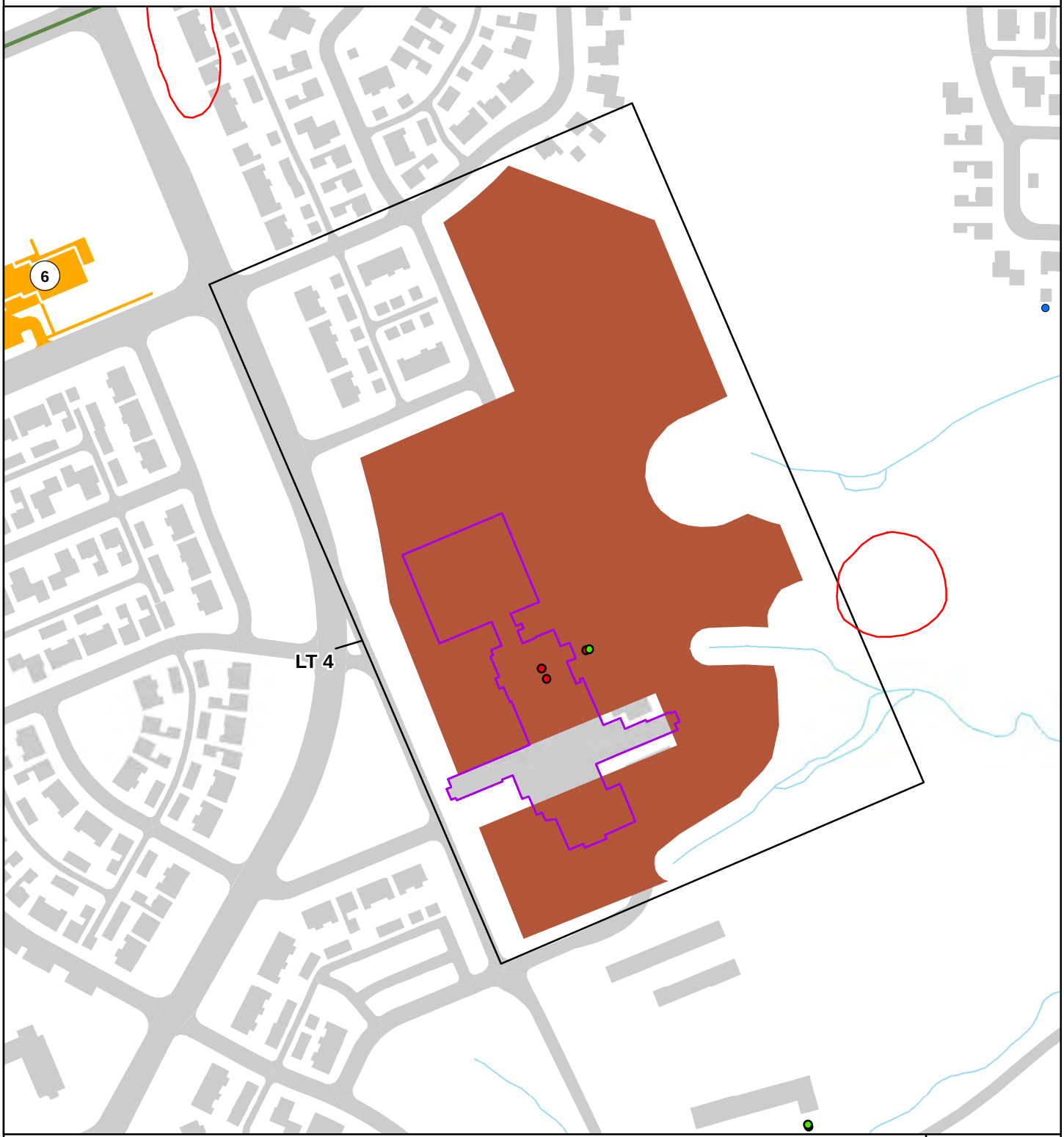
Hazardous Substance and Hazardous Materials - DeWitt Area



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Long-Term Improved Road
Restricted Site
Hazardous Waste Storage Area
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 260 520 Feet

Fort Belvoir RPMP EIS

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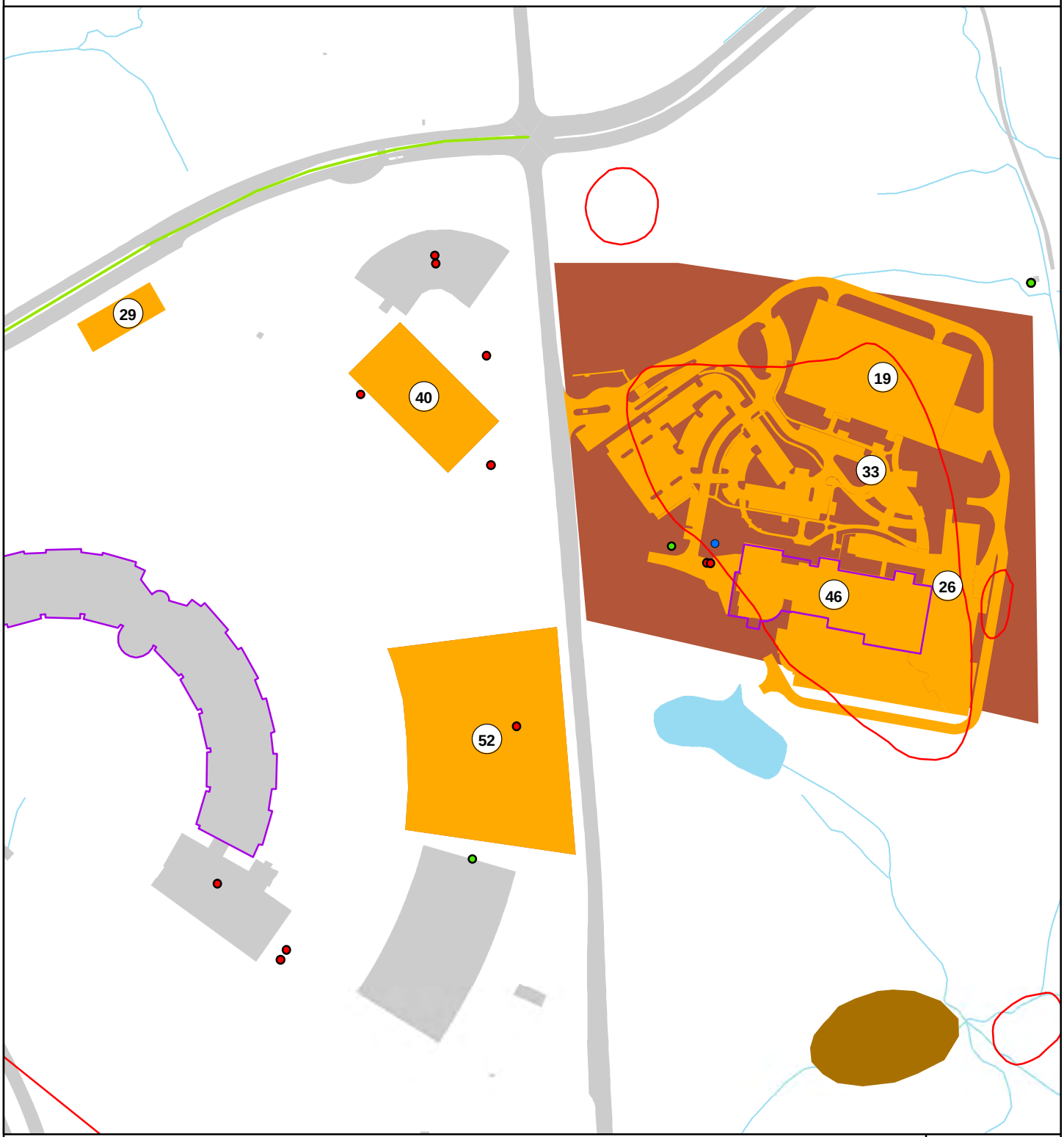
Hazardous Substance and Hazardous Materials - DLA & INSCOM



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Short-Term Improved Road
Restricted Site
Hazardous Waste Storage Area
Former Landfill
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 350 700 Feet

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Fort Belvoir RPMP EIS

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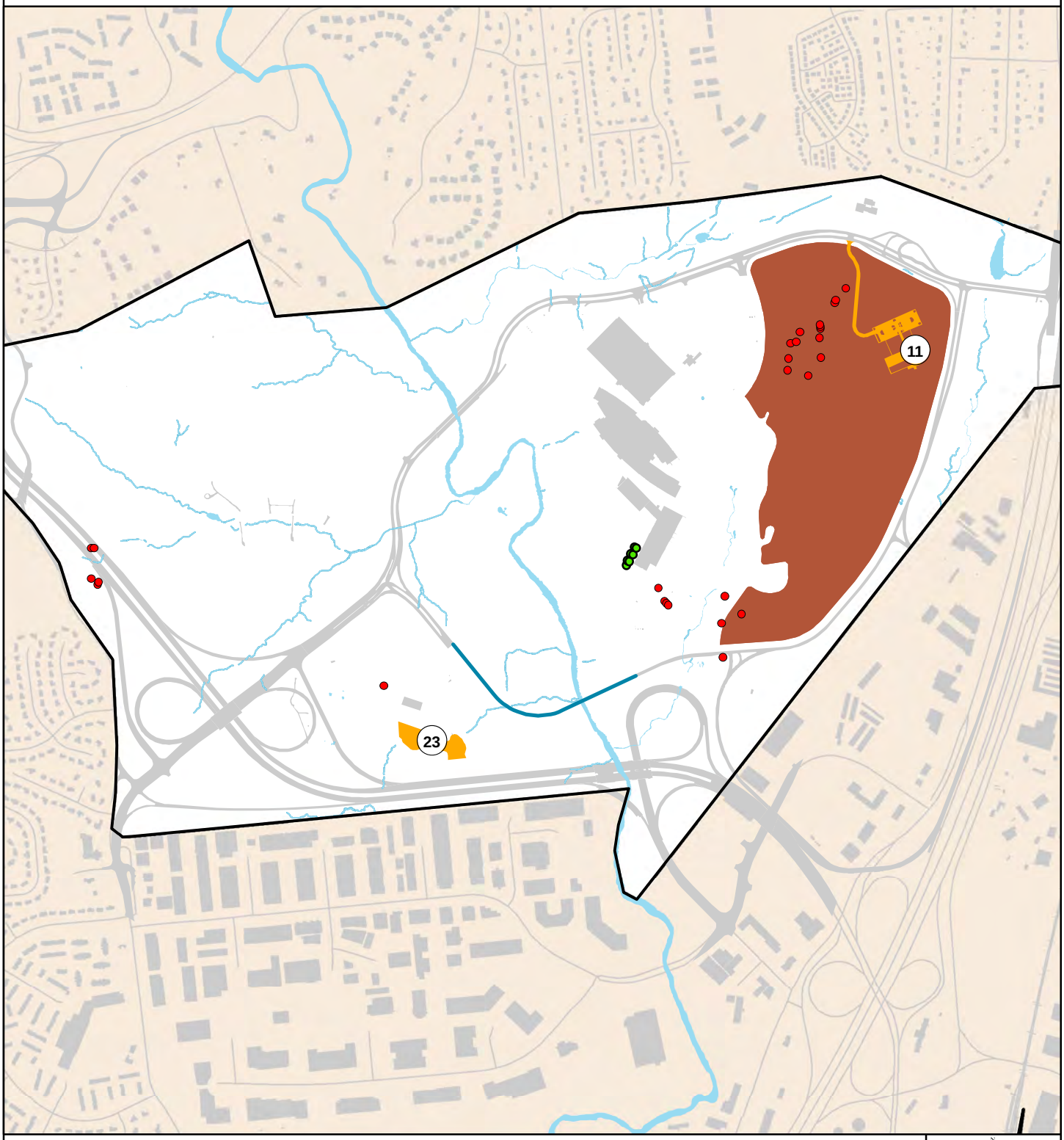
Hazardous Substance and Hazardous Materials - Fort Belvoir North Area



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Long-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 1,180 2,360 Feet

Fort Belvoir RPMP EIS

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Hazardous Substance and Hazardous Materials - South Post Town Center, Industrial Area, 200 Area

Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Former Landfill
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
Transit Transfer Center
Short-Term Project Sites (Construction FY 2012 - 2017)
Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 280 560 1,120
Feet

Fort Belvoir RPMP EIS

Figure 3.11-3

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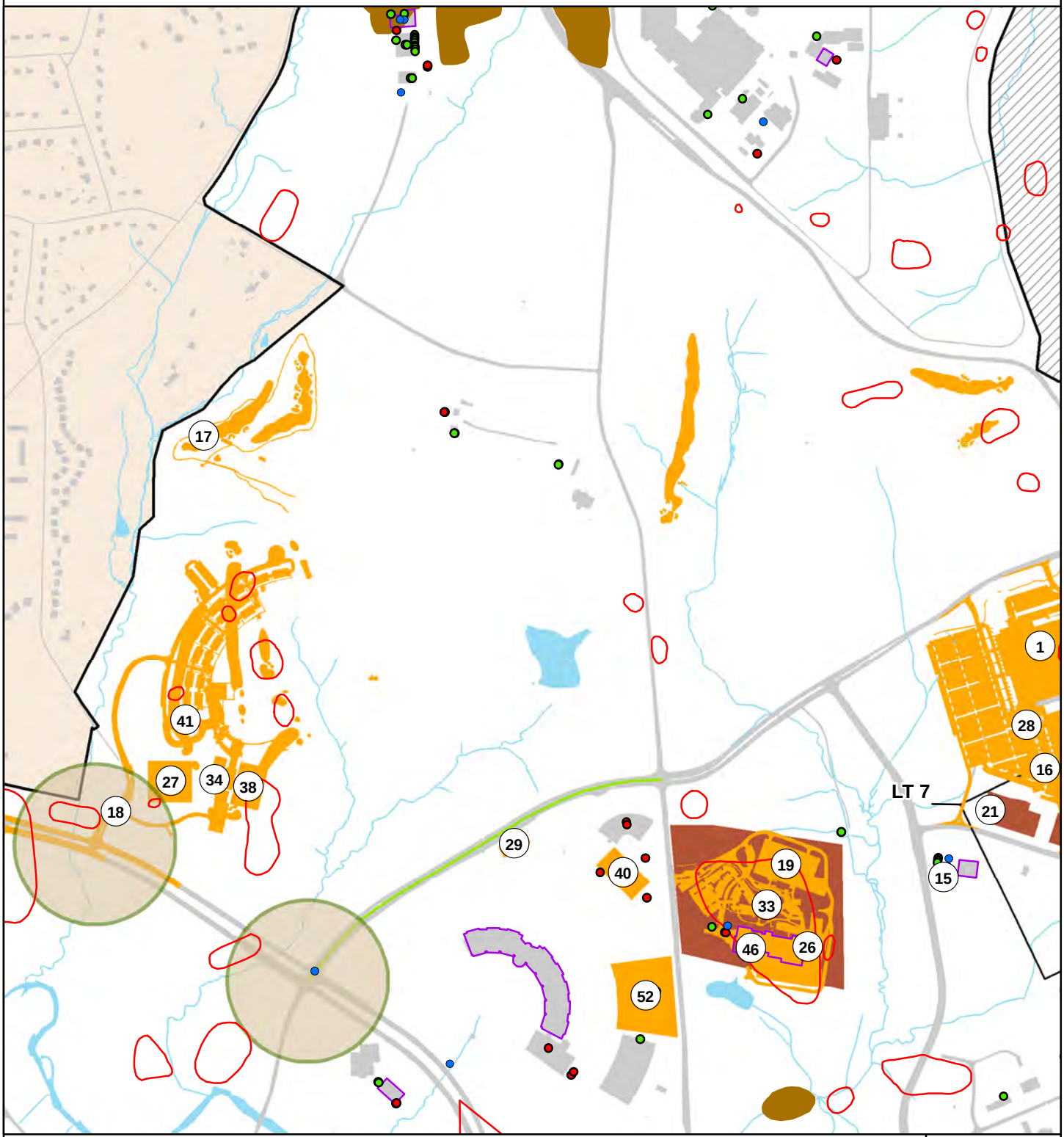
Hazardous Substance and Hazardous Materials - Golf Course Reconfiguration



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Former Landfill
Short-Term Improved Road
Long-Term Intersection Improvements
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 980 1,960 Feet

Fort Belvoir RPMP EIS

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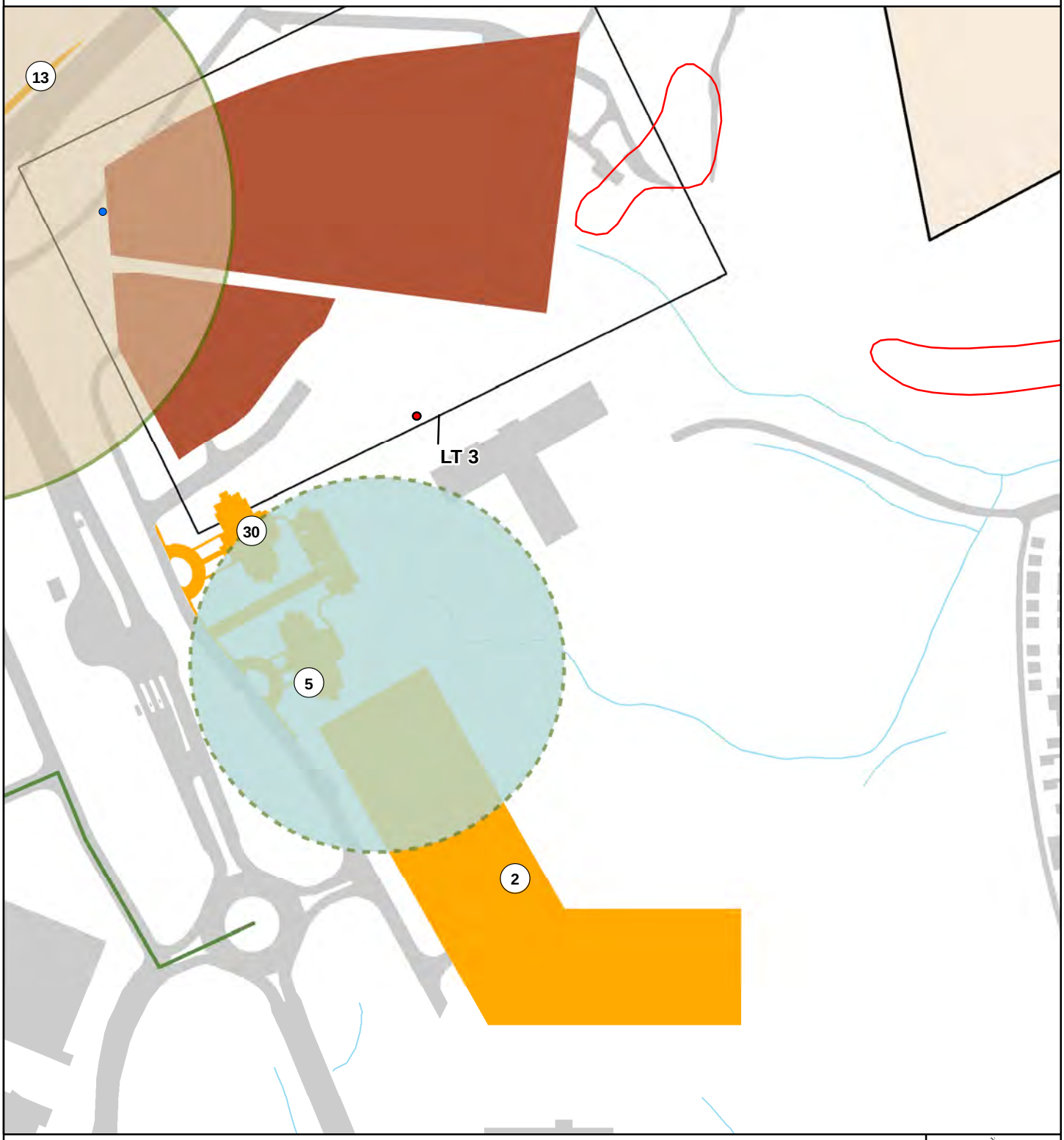
Hazardous Substance and Hazardous Materials - Grays Hill, PAL East of Belvoir Rd, Fisher House 1 & 2



Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Long-Term Intersection Improvements
Transit Transfer Center
Long-Term Improved Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 270 540 Feet

Fort Belvoir RPMP EIS

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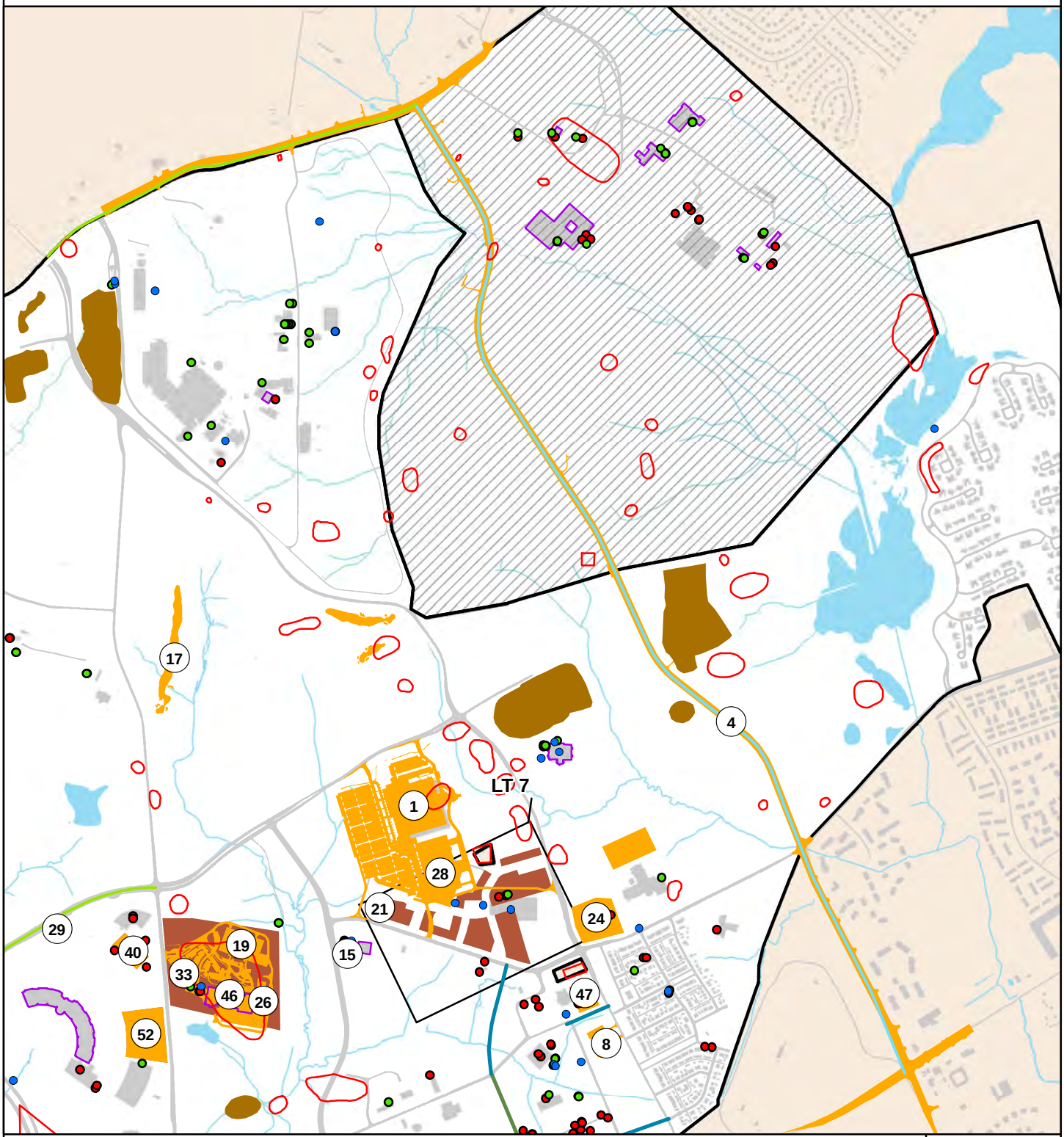
Hazardous Substance and Hazardous Materials - Mulligan Road



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Restricted Site
Hazardous Waste Storage Area
Former Landfill
Long-Term Improved Road
Long-Term New Road
Short-Term Improved Road
Short-Term New Road
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 1,450 2,900 Feet

Fort Belvoir RPMP EIS

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Hazardous Substance and Hazardous Materials - NICoE, Medical Office Building, USO

Active Petroleum Storage Area
Inactive Petroleum Storage Area
Long-Term Improved Road
Long-Term New Road
Restricted Site
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 260 520 Feet

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Fort Belvoir RPMP EIS

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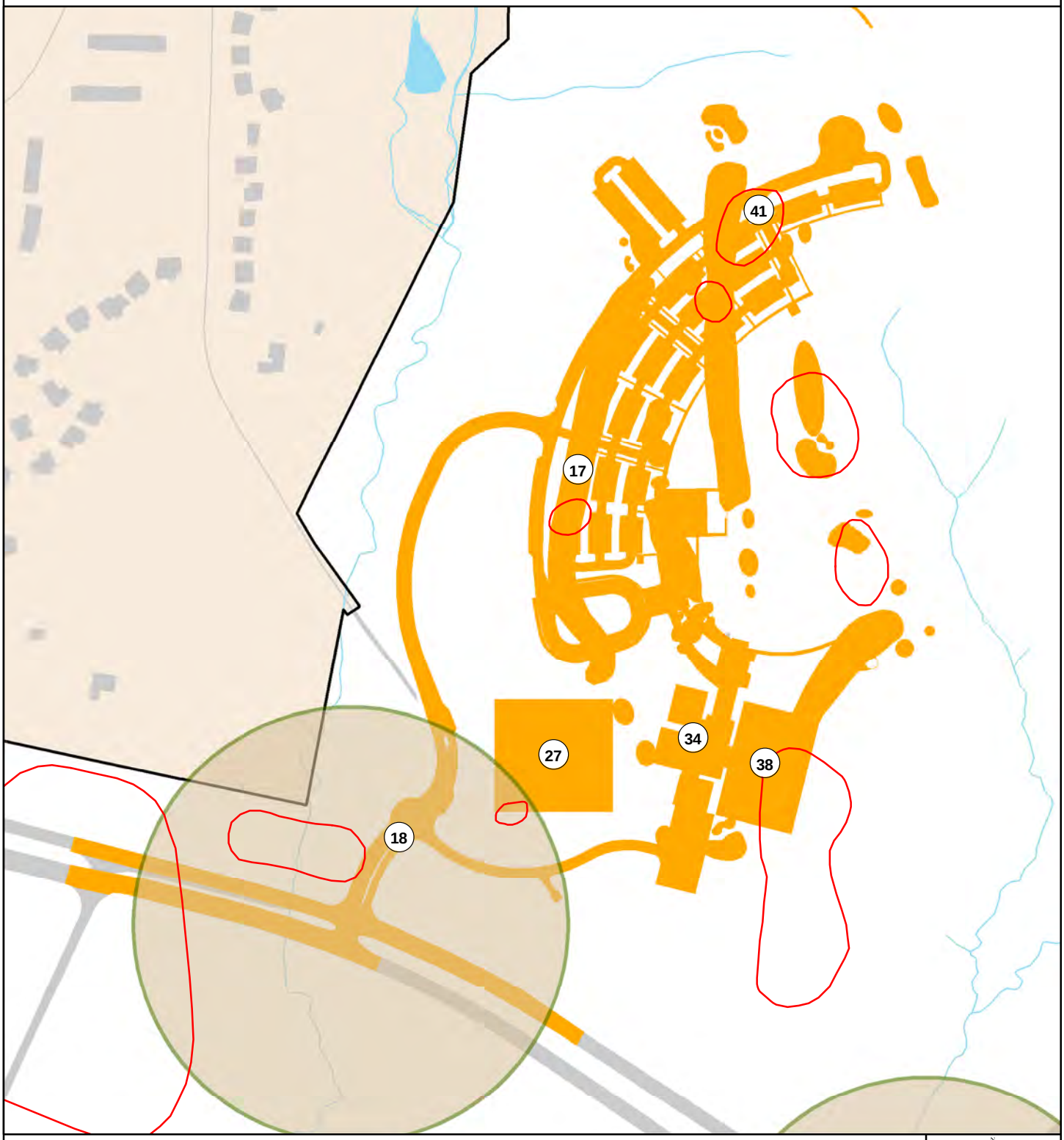
Hazardous Substance and Hazardous Materials - NICoE, Medical Office Building, USO



Restricted Site

Long-Term Intersection Improvements

45 Short-Term Project Sites (Construction FY 2012 - 2017)

Installation Boundary

0 360 720 Feet

Fort Belvoir RPMP EIS

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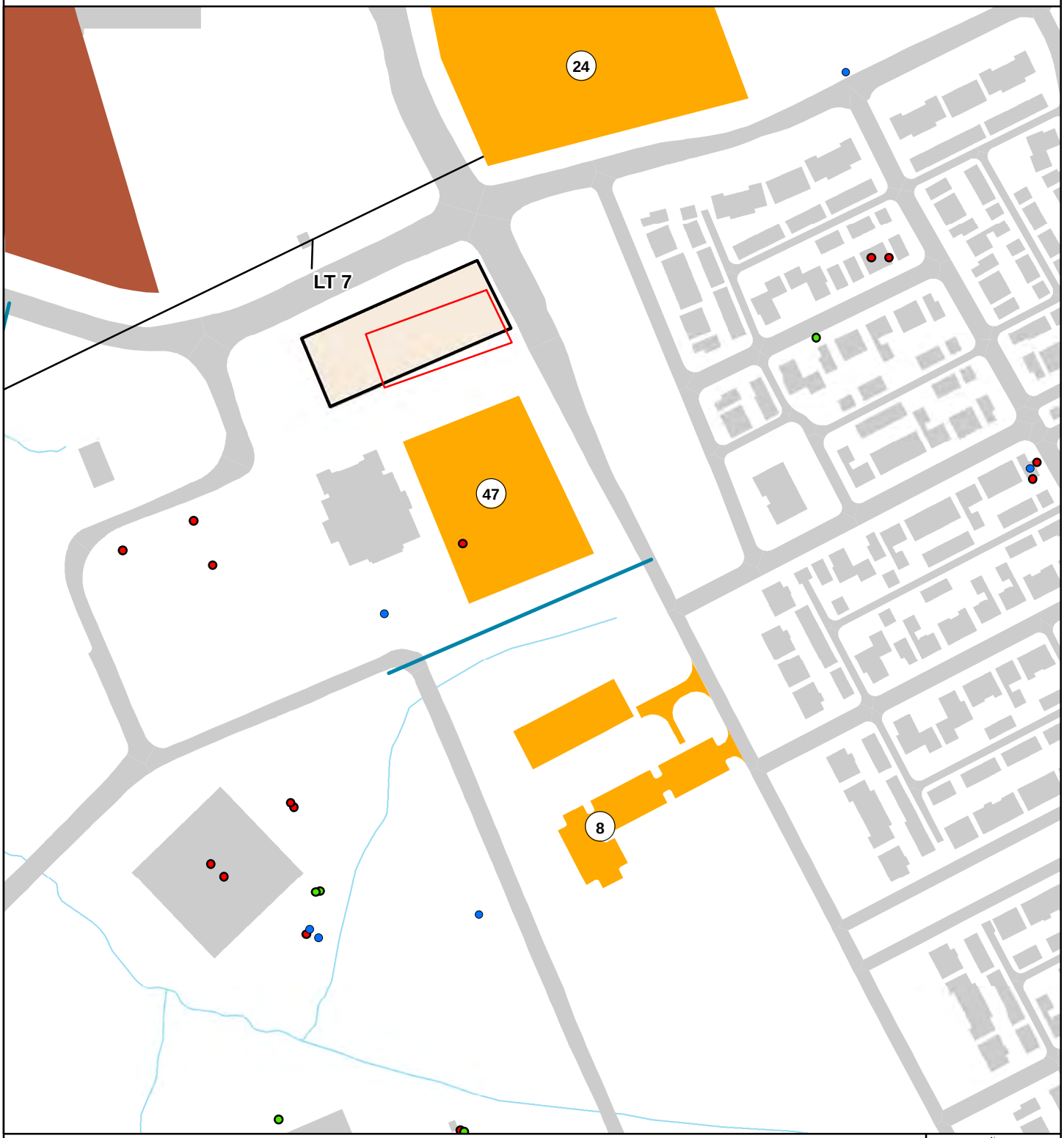
Hazardous Substance and Hazardous Materials - Religious Education Center, CDC 144



Active Petroleum Storage Area
Inactive Petroleum Storage Area
Petroleum Release Site
Long-Term New Road
Restricted Site
45 Short-Term Project Sites (Construction FY 2012 - 2017)
LT2 Long-Term Project Sites (Construction FY 2018 - 2030)
Installation Boundary

0 230 460 Feet

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Fort Belvoir RPMP EIS

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