PROJECT DEVELOPMENT AND ENVIRONMENT STUDY
GULF COAST PARKWAY
GULF AND BAY COUNTIES

Draft Traffic Report

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Draft Traffic Report

Gulf Coast Parkway

From

US 98 in Gulf County

To

US 231 in Bay County

Prepared for FDOT District 3

FPIN: 410981-2-28-01

Prepared by

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Tallahassee FL

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1.0 INTRODUCTION

A Project Development and Environment (PD&E) Study is being conducted to evaluate various alternatives for a new roadway that would connect US 98 in Gulf County with US 98 and US 231 in Bay County on a combination of existing and new alignments. The Gulf Coast Parkway (GCP), as this new roadway is known, is intended to provide a missing link in the transportation network, between US 98 at CR 386 in Gulf County (Beacon Hill/Mexico Beach/St. Joe Beach) and US 231 in Bay County (north of Panama City).

The general objective of this Traffic Analysis is to provide documented information necessary to assist in making a decision of the type, design and location of improvements to the GCP and other transportation facilities affected by it.

Traffic elements of this PD&E study such as existing and projected traffic volumes, trip distribution and assignment, and roadways level of service (LOS) are presented in this Report.

Section 5 of this report is an update to the report which incorporates new existing (2011) and future traffic projections (2035).

2.0 EXISTING YEAR TRAFFIC CONDITIONS

Information on historical and existing traffic conditions are essential elements in the traffic forecasting process. The data collection process included existing roadway configuration, historical traffic volumes and growth trends, and LOS analysis which provided an insight into the traffic patterns in the study area. As was mentioned in section 1, section 5 presents new traffic data including new existing traffic for the year 2011.

2.1 EXISTING ROADWAY CONFIGURATION

US 98 travels essentially parallel to the coastline of the Gulf of Mexico and is the only east-west facility south of SR 20 that serves communities beyond Bay County to the west and Gulf County to the east. This facility is a two-lane roadway that passes through Tyndall Air Force Base in Bay County. The segment of US 98 that passes through Tyndall Air Force Base is part of the National Highway System (NHS) and the Strategic Highway Network (STRAHNET). The STRAHNET is a network of highways which are important to the United States' strategic defense policy and which provides defense access, continuity and emergency capabilities for defense purposes. It is the only highway in, out, and through Tyndall Air Force Base. Should US 98 be temporarily closed for security purposes, travelers going between Panama City and the Mexico Beach/Beacon Hill/St. Joe Beach area would have to travel a detour of approximately 50 miles.

US 231 is a four-lane divided, controlled access highway. It provides north-south access between Panama City, Florida and the Alabama state line; is part of the NHS, is also on the STRAHNET, and is part of the Florida Strategic Intermodal System (SIS).

SR 22 is a two-lane highway which is 28 miles long and connects the communities of Wewahitchka, Gulf County and Springfield, Bay County. Its eastern terminus is the Apalachicola River and its western terminus is US 98 in Panama City. SR 22 is the only east-west route between US 98 to the south and SR 20 to north. For the residents in the Wewahitchka area, SR 22 is the most direct route to Panama City.

Another important roadway in the study area is CR 386 which connects US 98 in the Mexico Beach/Beacon Hill area with SR 71 in Wewahitchka. It is a two-lane, rural highway.

There are two additional paved roads within the study area; both are north-south county roads which serve local traffic. These are CR 2297 and CR 2315 (Star Avenue). CR 2297 extends from south of Richard Bayou, along the east side of East Bay, to SR 22. CR 2315 (Star Avenue) extends from east of the City of Callaway, north of East Bay, across SR 22 to US 231.

Between US 231 on the west and SR 71/SR 73 on the east, there are no northbound paved roads that connect to the major roadways in the regional transportation network. In addition, the nearest east-west roadway north of US 98 is SR 22. This roadway provides access solely between Wewahitchka and the communities southeast of Panama City. For the residents of the coastal communities, access to SR 22 requires traveling CR 386 to SR 71 to Wewahitchka, a

distance of approximately 25 miles. To reach US 98 in Springfield (East of Panama City) from Wewahitchka is approximately 25 miles.

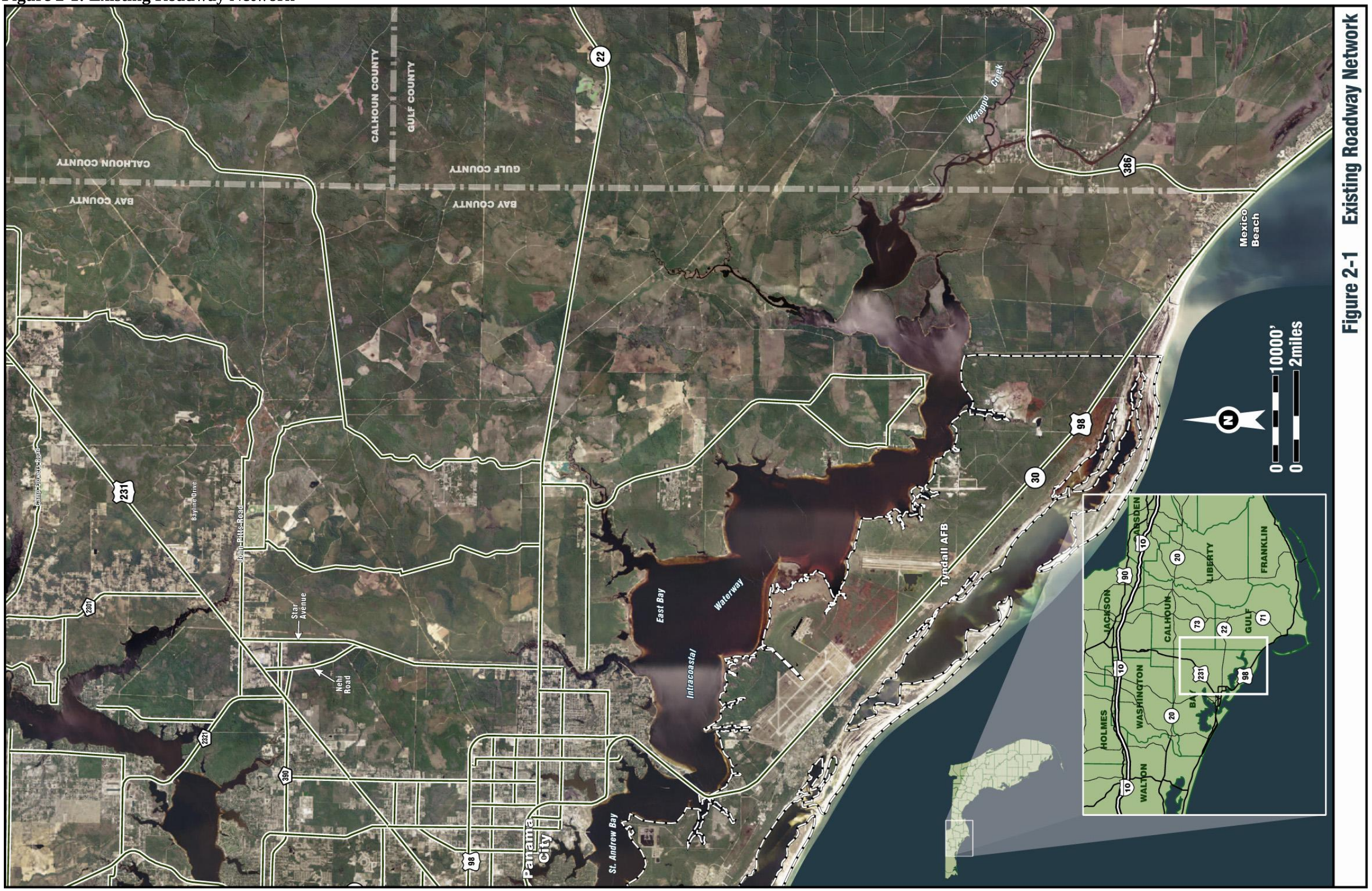
Table 2-1 provides a summary of the roadways most relevant attributes. Figure 2-1 shows the study area and the existing roadway network.

Table 2-1: Roadway Description

Roadway	Functional Classification	Facility Type	Area Type	Number of Lanes
Bay County				
US 98 (15th St. to Tyndall AFB)	Principal Arterial	Divided	Urban	4
US 98 (Tyndall AFB to Gulf Co. line)	Principal Arterial	Undivided	Rural Developed	2
US 231 (Transmitter Rd. to CR 390)	Principal Arterial	Divided	Urban	4
US 231 (CR 390 to east of Star Ave.)	Principal Arterial	Divided	Urban	4
SR 22 (Tyndall Pkwy to Boggy Creek Rd.)	Minor Arterial	Undivided	Urban	2
SR 22 (Boggy Creek Rd. to Parker Branch Rd.)	Minor Arterial	Undivided	Urban	2
SR 22 (Parker Branch Rd. to Gulf Co. line)	Minor Arterial	Undivided	Transitioning into Urban	2
CR 2327 (Transmitter Rd., b/w US 231 & US 98)	Minor Arterial	Undivided	Urban	2
CR 390 (West of US 231)	Urban Collector	Undivided	Urban	2
CR 2321 (North - Northwest of US 231)	Principal Arterial	Undivided	Urban	2
CR 2315 (Star Avenue)	Major Collector	Undivided	Urban	2
Gulf County				
US 98 (Bay Co. line to Beacon Hill)	Principal Arterial	Undivided	Rural Developed	2
SR 22 (Bay Co. Line to Wewahitchka)	Minor arterial	Undivided	Rural Undeveloped	2
SR 71 (Port St. Joe to Wewahitchka)	Minor arterial	Undivided	Rural Undeveloped	2
CR 386 (in Mexico Beach)	Minor arterial	Undivided	Rural Developed	2
CR 386 (Rest of Gulf Co.)	Minor arterial	Undivided	Rural Undeveloped	2

Source: ATKINS, based on
Year 2003 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in August 2005.
Year 2004 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, as adopted on Sept. 2004, from www.wfrpc.dst.fl.us/bctpo accessed in August 2005.

Figure 2-1: Existing Roadway Network



2.2 TRAFFIC ANALYSIS ASSUMPTIONS

2.2.1 Methodology

The Panama City Urbanized Area Transportation Study (PCUATS) travel demand model was recently expanded to include all of Bay County covering part of the study area for this project. However, only the base year for that model (year 2003) is available and all future years are yet to be finished by the West Florida Regional Planning Council, who is the local agency in charge of its development. The old PCUATS is based on year 1993 data and only encompasses urbanized portions of Bay County. As a consequence of these facts, the travel demand model is unusable and it was decided to develop existing and future year traffic using historical and existing year traffic counts, including an Origin and Destination (O-D) survey at key locations to gain insight on current traffic patterns, traffic growth trends, and future traffic distribution.

The Florida Department of Transportation (FDOT) has a good coverage of the existing roadway network in the study area. It was decided to supplement these data with additional traffic count locations, where 8-hour turning movement counts were made at peak and off-peak hours. Furthermore, an O-D traffic count was performed at key locations using a license tag methodology that provided additional support for the manual distribution and assignment of traffic in the future years.

The determination of existing conditions also included an analysis of traffic factors that are important for developing directional design hour volumes (DDHV) and for operational analysis.

2.2.2 Traffic Factors

The peak hour ("K") and directional ("D") factors are used to convert the Annual Average Daily Traffic (AADT) to peak hour directional volumes.

The K-factor is the ratio of the hourly two-way traffic to the two-way AADT. The K_{30} is the relationship between the 30th highest hourly volume of the year and the AADT for the design year. The K_{30} is used to determine the *design hour volume* (DHV).

The *directional distribution factor* (D-factor) is the percentage of the total, two-way peak hour traffic traveling in the peak direction. D_{30} is the proportion of traffic in the 30th highest hour of the design year traveling in the peak direction. The directional distribution is an essential parameter used to determine the DDHV. The DDHV is the basis of geometric design.

The *truck factor* (T_{24} or simply T) is critical for an accurate roadway pavement design. T is the percentage of trucks using a roadway for 24 hours.

The *peak hour factor* (PHF) is the hourly volume during the maximum hour of the day divided by the peak 15-minute rate of flow within the peak hour. It is used in operational analysis LOS determinations.

The FDOT traffic count stations and 2004 traffic factors for the study area are indicated in Table 2-2 and Table 2-3. The PHF was developed based on the additional traffic counts performed for this project, and it is also shown in Table 2-2.

Table 2-2: Year 2004 Traffic Factors

Count Station Number	Location	Peak Hour Traffic Factor (K)	Directional Factor (D)	Truck Factor (T_{24})	PHF
460215	CR 386 300' North of US 98	11.07	53.55	13.53	0.83
510101	CR 386 300' West of SR 71South of SR 22	12.82	60.10	10.80	0.86
511601	SR 71 South City Limits of Wewahitchka	12.82	60.10	7.65	0.91
511603	SR 71 100' North of SR 22	12.82	60.10	11.64	0.92
511602	SR 22 1.0 miles West of SR 71	12.82	60.10	8.23	0.84
460260	SR 22 300' East of Allanton Rd	10.60	60.49	6.18	0.96
461625	SR 22 50' East of Callaway Bayou Bridge	10.06	56.20	7.06	0.84
465189	SR 22 300' West of Star Avenue	10.06	56.20	6.18	1.00
465195	SR 22 300' East of US 98	10.06	56.20	6.18	0.90
510007	US 98 2.0 miles North of SR 382 N. of St. Joe	12.82	60.10	8.26	0.97
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	10.60	60.49	9.84	0.81
461624	US 98 300' North of East Bay (Tyndall) Bridge	10.06	56.20	3.99	0.94
465181	US 98 300' South of Boat Race Road	10.06	56.20	3.53	0.93
465182	US 98 300' South of Wallace Road	10.06	56.20	4.53	0.88
465194	US 98 T. PKWY. 300' South of SR 22	10.06	56.20	3.53	0.95
465193	US 98 300' North of SR 22	10.06	56.20	3.53	0.98
465161	US 98 300' East of Transmitter Road	10.06	56.20	3.53	0.95
*465038	US 98 300' East of SR 77	8.91	52.71	4.56	N/A
*465067	US 98 100 West of Church Avenue	10.43	66.96	3.89	N/A
*460305	US 98 250' West of Hathaway Bridge	9.64	56.81	4.56	N/A
465169	US 231 (1.09 miles West of Transmitter Rd	9.30	57.16	6.88	0.93
461630	US 231 (845' East of Transmitter Rd.)	9.30	57.16	11.15	0.95
460084	US 231 (500' West of Star Av.)	13.13	63.03	12.04	0.98
460082	US 231 (1.0 mile East of Star Av.)	13.13	63.03	12.04	0.94
461623	Transmitter Rd (800' North of US 98)	10.06	56.20	13.53	0.90
461621	Transmitter Rd (300' South of US 231)	10.06	56.20	7.34	0.93
461631	CR 390 (300' West of US 231)	10.06	56.20	13.53	0.96
460291	CR 2321 (300' North-northwest of US 231)	10.60	60.49	13.53	0.88
460266	CR 2293 (John Pitts Rd., 300' East of Star Av.)	10.60	60.49	13.53	0.68
	Average for Count Stations in the Study Area	**10.72**	**57.83**	**8.10**	**0.92**

Source: Calculated from 2004 FDOT Traffic Information CD and ATKINS traffic counts
Notes: * FDOT permanent count station

Table 2-3: Countywide AADT and Permanent Count Stations

Category/Site		Traffic Factors	
		K	D
4600	Bay, Recreational	11.07	53.55
4601	Bay, Rural	10.60	60.49
4602	Bay, Urban	10.06	56.20
4603	Bay, US231	13.13	63.03
4698	Bay, US98	9.30	57.16
	Average K and D factors for Bay County	10.83	58.09
5100	*Gulf Countywide*	12.82	60.10
*460305	US 98 250' West of Hathaway Bridge	9.64	56.81
*465067	US 98 100' West of Church Avenue	10.43	66.96
*465038	US 98 300' East of SR 77	8.91	52.71
	Average K and D factors for Permanent Count Stations	9.66	58.83

Source: Calculated from 2004 FDOT Traffic Information CD
Notes: * FDOT permanent count station

The actual composition of trucks is needed for operational analysis and noise studies. In addition to the T factors already defined, the following definitions are also needed:

Design Hour Truck (DHT)**:** The percent of trucks expected to use a highway segment during the 30th highest hour of the design year. The adjusted, annual design hour percentage of trucks and buses (24T+B or T_{24}) divided by two.

*DH2***:** The adjusted, annual design hour medium truck percentage. It is the sum of the annual percentages of Categories 4 and 5 (Figure 2.2 of the FDOT's Project Traffic Handbook), adjusted to 24 hours, and divided by two.

*DH3***:** The adjusted, annual design hour heavy truck percentage. It is DHT minus DH2, or the sum of the adjusted annual percentages of Categories 6 through 13 (Figure 2.2 in the FDOT's Project Traffic Handbook), divided by two.

A summary of the available FDOT data is presented in Table 2-4 and Table 2-5.

Table 2-4: Classified Traffic Counts, in Percentages of Daily Traffic

Count Station Number	Location	% Motorcycles	% Cars	% Buses	% Medium Trucks	% Heavy Trucks
460215	CR 386 300' North of US 98	0.00%	91.75%	0.04%	2.50%	5.68%
510101	CR 386 300' West of SR 71South of SR 22	0.00%	91.75%	0.04%	2.50%	5.68%
511601	SR 71 South City Limits of Wewahitchka	0.07%	92.29%	0.04%	2.68%	4.93%
511603	SR 71 100' North of SR 22	0.07%	92.29%	0.04%	2.68%	4.93%
511602	SR 22 1.0 mile West of SR 71	0.00%	91.75%	0.04%	2.50%	5.68%
460260	SR 22 300' East of Allanton Rd	0.64%	92.30%	0.04%	2.30%	4.73%
461625	SR 22 50' East of Callaway Bayou Bridge	0.64%	92.30%	0.04%	2.30%	4.73%
465189	SR 22 300' West of Star Avenue	0.64%	94.05%	0.01%	2.25%	2.97%
465195	SR 22 300 East of US 98	0.64%	92.30%	0.04%	2.30%	4.73%
510007	US 98 2.0 miles North of SR 382 N. of St. Joe	0.41%	91.83%	0.02%	2.17%	5.57%
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	0.49%	89.66%	0.10%	4.87%	4.87%
461624	US 98 300' North of East Bay (Tyndall) Bridge	0.85%	95.16%	0.09%	2.65%	1.25%
465181	US 98 300' South of Boat Race Road	0.85%	95.16%	0.09%	2.65%	1.25%
465182	US 98 300' South of Wallace Road	0.85%	95.16%	0.09%	2.65%	1.25%
465194	US 98 T. PKWY. 300' South of SR 22	0.67%	95.80%	0.08%	2.63%	0.83%
465193	US 98 300' North of SR 22	0.67%	95.80%	0.08%	2.63%	0.83%
465161	US 98 300' East of Transmitter Road	0.61%	95.84%	0.05%	2.52%	0.98%
*465038	US 98 300' East of SR 77	0.67%	95.26%	0.03%	1.96%	2.04%
*465067	US 98 100' West of Church Avenue	0.44%	92.96%	0.01%	5.93%	0.65%
*460305	US 98 250' West of Hathaway Bridge	0.59%	95.77%	0.08%	1.32%	2.24%
465169	US 231 (1.09 miles West of Transmitter Rd	0.53%	92.60%	0.08%	2.75%	4.06%
461630	US 231 (845' East of Transmitter Rd.)	0.43%	88.42%	0.32%	5.97%	4.85%
460084	US 231 (500' West of Star Av.)	0.43%	88.42%	0.32%	5.97%	4.85%
460082	US 231 (1.0 mile East of Star Av.)	0.43%	88.42%	0.32%	5.97%	4.85%
461623	Transmitter Rd (800' North of US 98)	0.79%	91.87%	0.18%	3.30%	3.87%
461621	Transmitter Rd (300' South of US 231)	0.79%	91.87%	0.18%	3.30%	3.87%
461631	CR 390 (300' West of US 231)	0.79%	91.87%	0.18%	3.30%	3.87%
460291	CR 2321 (300' North-northwest of US 231)	0.79%	91.87%	0.18%	3.30%	3.87%
460266	CR 2293 (John Pitts Rd., 300' East of Star Av.)	0.79%	91.87%	0.18%	3.30%	3.87%
	Areawide Averages	**0.53%**	**92.66%**	**0.10%**	**3.14%**	**3.57%**

Source: FDOT 2004 Traffic Information CD Annual Vehicle Classification Report Counts, Year 2004

Table 2-5: DHT Percentages

Count Station Number	Location	T_{24}	DHT	DH2	DH3
460215	CR 386 300' North of US 98	8.19%	4.11%	1.27%	2.84%
510101	CR 386 300' West of SR 71South of SR 22	8.19%	4.11%	1.27%	2.84%
511601	SR 71 South City Limits of Wewahitchka	7.61%	3.82%	1.36%	2.47%
511603	SR 71 100' North of SR 22	7.61%	3.82%	1.36%	2.47%
511602	SR 22 1.0 mile West of SR 71	8.19%	4.11%	1.27%	2.84%
460260	SR 22 300' East of Allanton Rd	7.02%	3.53%	1.17%	2.36%
461625	SR 22 50' East of Callaway Bayou Bridge	7.02%	3.53%	1.17%	2.36%
465189	SR 22 300' West of Star Avenue	5.30%	2.66%	1.13%	1.53%
465195	SR 22 300' East of US 98	7.02%	3.53%	1.17%	2.36%
510007	US 98 2.0 miles North of SR 382 North of St. Joe	7.74%	3.88%	1.10%	2.78%
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	9.74%	4.92%	2.49%	2.44%
461624	US 98 300' North of East Bay (Tyndall) Bridge	3.90%	2.00%	1.37%	0.62%
465181	US 98 300' South of Boat Race Road	3.90%	2.00%	1.37%	0.62%
465182	US 98 300' South of Wallace Road	3.90%	2.00%	1.37%	0.62%
465194	US 98 T. PKWY. 300' South of SR 22	3.45%	1.76%	1.35%	0.41%
465193	US 98 300' North of SR 22	3.45%	1.76%	1.35%	0.41%
465161	US 98 300' East of Transmitter Road	3.50%	1.77%	1.28%	0.49%
*465038	US 98 300' East of SR 77	4.03%	2.03%	1.00%	1.03%
*465067	US 98 100' West of Church Avenue	6.59%	3.30%	2.97%	0.33%
*460305	US 98 250' West of Hathaway Bridge	3.56%	1.82%	0.70%	1.12%
465169	US 231 (1.09 miles West of Transmitter Rd	6.80%	3.44%	1.42%	2.02%
461630	US 231 (845' East of Transmitter Rd.)	10.83%	5.58%	3.15%	2.43%
460084	US 231 (500' West of Star Av.)	10.83%	5.58%	3.15%	2.43%
460082	US 231 (1.0 mile East of Star Av.)	10.83%	5.58%	3.15%	2.43%
461623	Transmitter Rd (800' North of US 98)	7.16%	3.67%	1.74%	1.93%
461621	Transmitter Rd (300' South of US 231)	7.16%	3.67%	1.74%	1.93%
461631	CR 390 (300' West of US 231)	7.16%	3.67%	1.74%	1.93%
460291	CR 2321 (300' North-northwest of US 231)	7.16%	3.67%	1.74%	1.93%
460266	CR 2293 (John Pitts Rd., 300' East of Star Av.)	13.53%	6.77%	n/a	n/a
	Areawide Averages	**6.71%**	**3.40%**	**1.62%**	**1.78%**

Source: FDOT 2004 Traffic Information CD Annual Vehicle Classification Report Count Year 2004

The additional traffic counts that were taken for this project allowed for an independent calculation of the Ks and Ds, as shown in Table 2-6.

Table 2-6: Comparison of Traffic Factors from FDOT Database and 2005 Traffic Counts

Category/Site (FDOT)	Segments for 2005 Traffic Counts	FDOT Traffic Factors		Count Traffic Factors	
		K	D	K	D
Bay, Urban 4602	US 98 Transmitter to Tyndall AFB	10.06	56.20	8.20	51.80
Bay, Rural 4601	US 98 Tyndall AFB to Gulf County line	10.60	60.49	8.60	53.20
Bay, Urban 4602	SR 22 US 98 east to Star Avenue	10.06	56.20	9.00	59.70
Bay, Rural 4601	SR 22 Star Avenue to Gulf County line	10.60	60.49	9.60	55.30
Bay, US 231 4603	Transmitter Road to Star Avenue	13.13	63.03	9.70	63.90
	Average	**10.89**	**59.28**	**9.02**	**56.78**

Source: Calculated from 2004 FDOT Traffic Data CD and ATKINS traffic counts

Additionally, Ks and Ds should fall within the ranges specified in Table 2-7.

Table 2-7: FDOT and National Recommended Traffic Factors

Road Type	Average K	Average D
Urban Arterial (FDOT)	10.20%	57.90%
Rural Arterial (FDOT)	11.00%	58.10%
Suburban Arterial (HCM National Value)	10% - 15%	52% - 57%

Source: FDOT Project Traffic Forecasting Handbook, 2001

Based on all previous considerations, the adopted traffic factors are shown in Table 2-8.

Table 2-8: Recommended Traffic Factors

Road Type/Area	K_{30}	D_{30}	T_{24}	DHT	DH2	DH3
Urban Arterial (FDOT)	10.20%	57.90%				
Rural Arterial (FDOT)	11.00%	58.10%				
Suburban Arterial (HCM National Value)	10% - 15%	52% - 57%				
Average from FDOT Stations	10.72%	57.83%	6.71%	3.40%	1.62%	1.78%
Average form 2005 Counts	9.02%	56.78%				
Average for Bay County	10.83%	58.09%				
Average for Gulf County	12.82%	60.10%				
Adopted Values	**11.00%**	**58.00%**	**6.71%**	**3.40%**	**1.62%**	**1.78%**

Sources:
FDOT Project Traffic Forecasting Handbook, 2001
FDOT 2004 Traffic Information CD
ATKINS calculations

2.3 HISTORICAL AND EXISTING YEAR 2005 TRAFFIC

2.3.1 FDOT Traffic Counts

The FDOT year 2004 traffic counts are presented in Table 2-9. Traffic historical rate of growth (average for the last 10-year period) is also shown in Table 2-9.

Table 2-9: FDOT Traffic Counts

Count Station	Location	Data Available Since	Historic Traffic Annual Percent Growth 1995-2004	Year 2004 AADT
460215	CR 386 300' North of US 98	2001	0.00%	1,300
510101	CR 386 300' West of SR 71 South of SR 22	1974	5.13%	950
511601	SR 71 South City Limits of Wewahitchka	1970	6.17%	5,600
511603	SR 71 100' North of SR 22	1970	3.07%	6,000
511602	SR 22 1.0 mile West of SR 71	1970	1.33%	2,800
460260	SR 22 300' East of Allanton Rd	1970	1.17%	4,200
461625	SR 22 50' East of Callaway Bayou Bridge	1970	5.44%	7,300
465189	SR 22 300' West of Star Avenue	2000	0.77%	13,400
465195	SR 22 300' East of US 98	1974	3.65%	19,400
510007	US 98 2.0 miles North of SR 382 North of St. Joe	1974	1.37%	7,300
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	1970	1.72%	6,700
461624	US 98 300' North of East Bay (Tyndall) Bridge	1974	-0.65%	24,000
465194	US 98 T. PKWY. 300' South of SR 22	1977	1.88%	34,500
465193	US 98 300' North of SR 22	1977	3.46%	40,000
465161	US 98 300' East of Transmitter Road	1976	3.47%	31,500
*465038	US 98 300' East of SR 77	1974	5.84%	30,360
*460305	US 98 250' West of Hathaway Bridge	1995	2.53%	60,000
465169	US 231 (1.09 miles West of Transmitter Rd	1974	5.23%	25,000
461630	US 231 (845' East of Transmitter Rd.)	1977	6.10%	28,500
460084	US 231 (500' West of Star Av.)	2000	1.74%	23,000
460082	US 231 (1.0 miles East of Star Av.)	1971	1.03%	23,500
460093	US 231 (1,480' South of CR 388 at Youngstown)	1995	5.10%	15,200
461623	Transmitter Rd (800' North of US 98)	1970	1.74%	15,500
461621	Transmitter Rd (300' South of US 231)	1970	2.47%	11,000
461631	CR 390 (300' West of US 231)	1977	6.42%	7,100
460291	CR 2321 (300' North-northwest of US 231)	1988	2.86%	4,400
460266	CR 2293 (John Pitts Rd., 300' East of Star Av.)	1970	1.31%	3,800
	Annual Average Historical Traffic Growth Rate		**2.98%**	

Source: Calculated from 2004 FDOT Traffic Data CD
Notes: * FDOT permanent count station
Historical annual percent growth rate calculated for the last 10 years only.

2.3.2 Existing Year Daily Traffic Volumes

Using the average traffic growth rate from Table 2-9, year 2004 traffic volumes were factored up to reflect year 2005 conditions. FDOT traffic counts are shown in Table 2-10, factored up as mentioned, as well as the supplemental traffic counts performed in 2005. The adopted year 2005 volumes are the ones most recent that were actually observed in the field, not calculated using growth rates, if they were available.

Figures in the following Section 3 show the AADTs for all future years and also the existing year traffic volumes along the project. All traffic counts data are added to this report in Appendix A.

Table 2-10: Year 2005 Existing Traffic

Count Station	Location	Year 2004 AADT from FDOT	Year 2005 AADT from Traffic Counts	FDOT Traffic Projected to Year 2005	Adopted Year 2005 Traffic
460215	CR 386 300' North of US 98	1,300	n/a	1,300	1,300
n/a	CR 386 North of US 98	n/a	5,100		5,100
n/a	CR 386 South of 15th St. in Mexico Beach	n/a	1,700		1,700
n/a	CR 386 North of 15th St. in Mexico Beach	n/a	1,900		1,900
n/a	CR 386 West of N. Long St. (Gulf Co.)	n/a	1,200		1,200
n/a	CR 386 East of N. Long St. (Gulf Co.)	n/a	1,500		1,500
510101	CR 386 300' West of SR 71 (South of SR 22, Gulf Co.)	950	n/a	1,000	1,000
511601	SR 71 South City Limits of Wewahitchka	5,600	n/a	5,800	5,800
511603	SR 71 100' North of SR 22	6,000	n/a	6,200	6,200
511602	SR 22 1.0 mile West of SR 71 (Gulf Co.)	2,800	n/a	2,900	2,900
n/a	SR 22 East of Sandy Creek Road	n/a	3,300		3,300
n/a	SR 22 West of Sandy Creek Road	n/a	3,000		3,000
n/a	SR 22 East of Old Allanton Road	n/a	3,300		3,300
n/a	SR 22 West of Old Allanton Road	n/a	3,300		3,300
n/a	SR 22 East of E. Callaway Road	n/a	3,400		3,400
n/a	SR 22 West of E. Callaway Road	n/a	4,200		4,200
460260	SR 22 East of CR 2297 (Allanton Rd.)	4,200	4,200	4,300	4,200
n/a	SR 22 West of CR 2297 (Allanton Rd.)	n/a	3,000		3,000
461625	SR 22 50' East of Callaway Bayou Bridge	7,300	n/a	7,500	7,500
n/a	SR 22 East of Star Avenue	n/a	10,300		10,300
465189	SR 22 West of Star Avenue	13,400	15,500	13,800	15,500
465195	SR 22 300' East of US 98	19,400	20,900	20,000	20,900
n/a	SR 22 West of US 98	n/a	11,100		11,100
510007	US 98 2.0 miles North of SR 382 N. of St. Joe	7,300	n/a	7,500	7,500
n/a	US 98 East of CR 386 in Mexico Beach	n/a	9,800		9,800
n/a	US 98 West of CR 386 in Mexico Beach	n/a	9,100		9,100
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	6,700	n/a	6,900	6,900
465194	US 98 South of SR 22	34,500	46,400	35,500	35,500
465193	US 98 North of SR 22	40,000	46,700	41,200	41,200
n/a	US 98 South of 11th Street	n/a	45,900		45,900
n/a	US 98 North of 11th Street	n/a	43,700		43,700
n/a	US 98 North of 12th Street	n/a	43,400		43,400
n/a	US 98 North of 14th St./Tram Road	n/a	42,600		42,600
465161	US 98 East of Transmitter Road	31,500	43,300	32,400	32,400
n/a	US 98 West of Transmitter Road	n/a	38,000		38,000
*465038	US 98 300' East of SR 77	30,360	n/a	31,300	

Table 2-10: Year 2005 Existing Traffic (cont)

Count Station	Location	Year 2004 AADT from FDOT	Year 2005 AADT from Traffic Counts	FDOT Traffic Projected to Year 2005	Adopted Year 2005 Traffic
n/a	US 231 West of Transmitter Rd.	n/a	26,600		26,600
n/a	US 231 East of Transmitter Rd.	n/a	28,100		28,100
n/a	US 231 West of CR 390	n/a	25,400		25,400
n/a	US 231 Between CR 390 & CR2321/Nehi Rd	n/a	34,800		34,800
n/a	US 231 East of CR 2321/Nehi Rd	n/a	29,900		29,900
n/a	US 231 West of Star Av (B/w Titus Rd & Star Av)	n/a	29,700		29,700
n/a	US 231 East of Star Av.	n/a	28,800		28,800
460082	US 231 (1.0 mile East of Star Av.)	23,500	n/a	24,200	24,200
460093	US 231 (1,480' South of CR 388 at Youngstown)	15,200	n/a	15,700	15,700
n/a	Star Ave South of SR 22	n/a	5,700		5,700
n/a	Star Ave North of SR 22	n/a	7,800		7,800
n/a	Star Ave South of Tram Rd	n/a	7,200		7,200
n/a	Star Ave North of Tram Rd	n/a	7,300		7,300
n/a	Star Ave South of US 231	n/a	8,200		8,200
n/a	Tram Rd. East of US 98	n/a	900		900
n/a	Transmitter Rd South of US 98	n/a	10,100		10,100
461623	Transmitter Rd North of US 98	15,500	17,300	16,000	16,000
461621	Transmitter Rd South of US 231	11,000	11,700	11,300	11,300
461639	Transmitter Rd North of US 231	5,600	5,800	5,800	5,800
461631	CR 390 North - North West of US 231	7,100	9,000	7,300	7,300
460291	CR 2321 North - Northwest of US 231	4,400	5,400	4,500	4,500
460266	CR 2293 (John Pitts Rd., 300' east of Star Av.)	3,800	n/a	3,900	3,900

Source: 2004 FDOT Traffic Data CD; 2005 traffic counts from ATKINS; traffic growth rate from Table 2-9
Notes: * FDOT permanent count station
Unless indicated otherwise, the count stations are located in Bay County.

3.0 FUTURE YEARS TRAFFIC CONDITIONS

Existing traffic volumes and trends, as well as an evaluation of expected land use development in the corridor, and major socio-economic parameters such as population growth trends are all considered when doing a traffic projection.

Traffic projections should always be examined for reasonableness in comparison with existing traffic volumes and historical trends, the project being considered, and the land use scenarios that are consistent with observed development in the region.

3.1 TRAFFIC ANALYSIS ASSUMPTIONS

3.1.1 Methodology

Future year traffic was developed for the opening year for the facility, an interim year, and the design year. It was assumed that the year 2012 will be the opening year. FDOT guidelines (Project Traffic Forecasting Handbook, FDOT - 2002) establishes a 20-year period for the design year forecast after the opening year. So, design year is then 2032 and an interim year of 2022 was determined as the mid-point between opening and design years.

Since a travel demand model was not available, analysis of traffic trends using the FDOT methodology (described in *Project Traffic Forecasting Manual*, FDOT, 2002) was used. According to this methodology, to predict future traffic volume for the highway facilities in the study area, historical traffic data obtained from FDOT traffic station records were entered into a trend analysis spreadsheet developed by FDOT to estimate the overall trend of growth patterns.

Traffic patterns from the past 10 years were utilized to forecast future traffic volumes, which also included traffic growth from existing developments in the area and through traffic. Natural population growth and land use development are already captured by growth rates calculation. Large scale development or "Development of Regional Impacts" (DRI) should be considered separately because they have a significant impact in the region's transportation system.

Existing year traffic volumes and their projection for the future using growth rates derived from the regression analysis tools, were considered to be the "background" traffic. This background traffic was checked against known minor land use development to make sure traffic growth was reasonable, based on information provided by Bay and Gulf Counties, and other local governments within the study area. Appendix B shows a list of these developments. The background traffic volumes plus the DRI traffic, as documented in the *GCP Corridor Feasibility Study Report*, ATKINS - 2003, formed the basis for the project traffic projections.

Another important consideration for future conditions is the trip distribution in the study area, the future years traffic factor assumptions, and the expected LOS resulting from this distribution. The latter is described in Section 4 of this report.

3.1.2 Traffic Distribution

Traffic volumes were manually distributed based on current traffic turning movement counts and an O-D survey performed using a license tag methodology that included video cameras, traffic counters, both mechanical and personnel, on the roadside to assure quality of results.

The GCP O-D Study was conducted by HSA Consulting Group, a sub-consultant member of the ATKINS Team for this project, on September 21 and 22, 2005. The five O-D sites were:

1. US 98 east of CR 386
2. US 98 west of Hathaway Bridge
3. SR 77 north of North Bay Bridge
4. CR 2321 south of CR 2311
5. US 231 north of Star Avenue

Digital video cameras were used to record license tag numbers in each direction of travel at each of the above five locations. Data was collected continuously from 3:00 – 6:00 PM on Wednesday, September 21, and from 6:30 – 9:30 AM on Thursday, September 22. Concurrent with the video data collection, 24-hour directional volume counts were conducted using road tubes at each of five sites.

All digital video was then downloaded and reviewed, and license tag numbers were entered into a database. When complete tag numbers could not be determined from the video, partial numbers were entered, with asterisks serving as “wild cards”. The database also contains a field for identifying a vehicle as a truck.

Sample percentages were determined by comparing the number of database records to the appropriate volume from the tube counts. The sample percentages ranged from 63% (SR 77 outbound in the AM) to 99% (CR 2321 inbound in the PM).

A computer program was developed to identify license number matches. Rules were incorporated into the program to account for the similarity of certain characters, such as “8” and “B”, “5” and “S”, or “O”, “D”, “Q”, and zero. For each three-hour block of vehicles entering the Panama City urban area at a given O-D site, the program was applied to identify matching tag numbers of vehicles exiting the area at each of the other four sites. The AM and PM blocks were analyzed separately (matches were not determined for vehicles entering the urban area in the AM and exiting in the PM, or vice versa). The program generated lists of exact matches and potential matches of partial tag numbers. For the partial matches, the video was reviewed to determine if they were actually the same vehicle.

The matches were summarized for all vehicles and for trucks only. The numbers of truck matches were very low, so it is difficult to draw conclusions from the truck data. The percentage of trucks sampled was not specifically compiled, but was considerably lower than for other vehicles, since truck license tags were often not viewable in the video.

Table 3-1 summarized the results. At the count station located on US 98, east of CR 386, through traffic traveling through Panama City accounted for as much as 10% of the traffic volumes

currently passing at this count station, while approximately 90% were going to undetermined destinations in Panama City, Callaway, or Springfield.

Table 3-1: O-D Survey Results-Peak Hour, Daily volumes and Percent Distributions

AM & PM Peak Traffic Combined

From Site	Inbound Volume	To Site										
		US 98 E of CR 386		US 98 W of Hathaway Bridge		SR 77 N of Bay Bridge		CR 2321 S of CR 2311		US 231 N of N Star Avenue		Total
US 98 East of CR 386	1,509	N/A	N/A	55	3.6459%	19	1.2595%	9	0.5966%	19	1.2595%	102
US 98 West of Hathaway Bridge	10,787	45	0.4172%	N/A	N/A	150	1.3906%	42	0.3894%	382	3.5413%	619
SR 77 North of Bay Bridge	4,385	1	0.0228%	252	5.7470%	N/A	N/A	32	0.7298%	58	1.3227%	343
CR 2321 South of CR 2311	1,470	5	0.3401%	28	1.9044%	18	1.2243%	N/A	N/A	210	14.2832%	261
US 231 North of N Star Avenue	5,582	17	0.3045%	445	7.9715%	46	0.8240%	165	2.9557%	N/A	N/A	673
Total	**23,733**											**1,998**

Daily Traffic (AADT)

From Site	Inbound Volume	To Site										
		US 98 E of CR 386		US 98 W of Hathaway Bridge		SR 77 N of Bay Bridge		CR 2321 S of CR 2311		US 231 N of N Star Avenue		Total
US 98 East of CR 386	4,170	N/A	N/A	152	3.6459%	53	1.2595%	25	0.5966%	53	1.2595%	283
US 98 West of Hathaway Bridge	35,706	149	0.4172%	N/A	N/A	497	1.3906%	139	0.3894%	1,264	3.5413%	2,049
SR 77 North of Bay Bridge	11,277	3	0.0228%	648	5.7470%	N/A	N/A	82	0.7298%	149	1.3227%	882
CR 2321 South of CR 2311	3,725	13	0.3401%	71	1.9044%	46	1.2243%	N/A	N/A	532	14.2832%	662
US 231 North of N Star Avenue	15,264	46	0.3045%	1,217	7.9715%	126	0.8240%	451	2.9557%	N/A	N/A	1,840
Total	**70,142**											**5,716**

Source: ATKINS Team calculation, based on field counts

The O-D results and local knowledge of the study area provide the basis for future traffic distribution within the corridor. For trips to/from Mexico Beach area and east of CR 386, there are three possible routes to reach Star Ave.@ SR 22 general vicinity, as shown in Table 3-2, not considering the congestion that is currently being experienced by drivers on US 98, south of SR 22 and on SR 22 east of US 98, which could add additional time delays on travelers using existing US 98.

Table 3-2: Alternative Routes from Mexico Beach to Star Avenue @ SR 22

New Road		Using SR 71		Existing US 98	
Distance (mi.)	**Time (min.)**	**Distance (mi.)**	**Time (min.)**	**Distance (mi.)**	**Time (min.)**
26.51	28.92	44.20	48.22	24.00	26.18

Source: ATKINS calculation, assuming the same free flow speed of 55.0 mph on all 3 routes

The numbers in Table 3-2 make plausible the assumption that travelers to/from Mexico Beach and areas abutting US 98, east of CR 386, and not going to US 231 or CR 2321, may consider using GCP or existing US 98 in a 50/50 percentage split. Travelers to/from Mexico Beach and its vicinity, going/coming from CR 2321 or US 231 might definitely consider GCP since it will provide the shortest path and it will also avoid existing US 98 congestion in Parker, Callaway, or Springfield. No traffic would be diverted to SR 71 since it provides the longest path for the O-D pairs under consideration. A summary of the distribution assumptions is shown in Figures 3-1a to 3-1k.

Figure 3-1a: Alignment 8, Option a: Future Traffic Distribution Assumptions

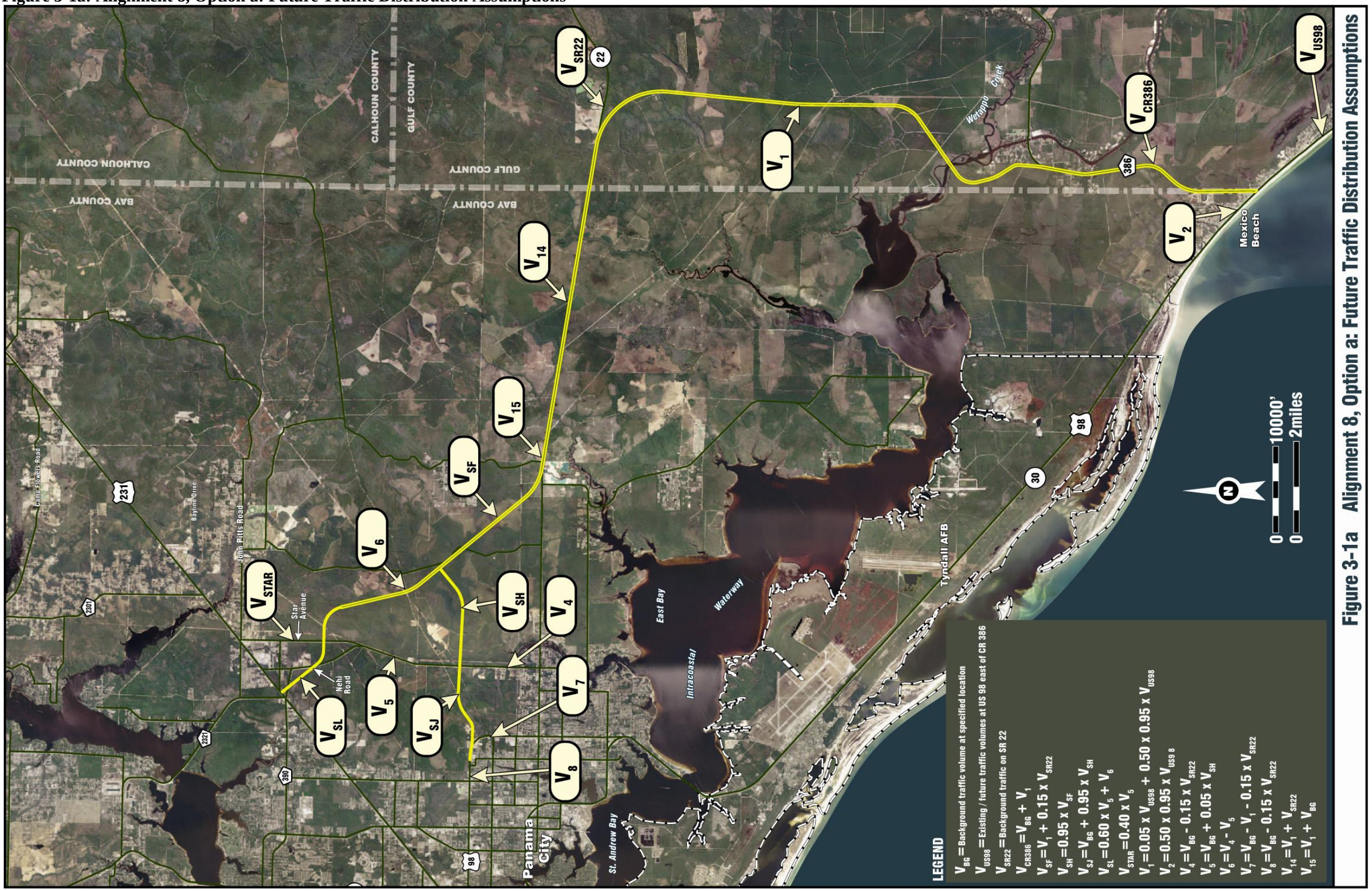


Figure 3-1a Alignment 8, Option a: Future Traffic Distribution Assumptions

Figure 3-1b: Alignment 8, Option b: Future Traffic Distribution Assumptions

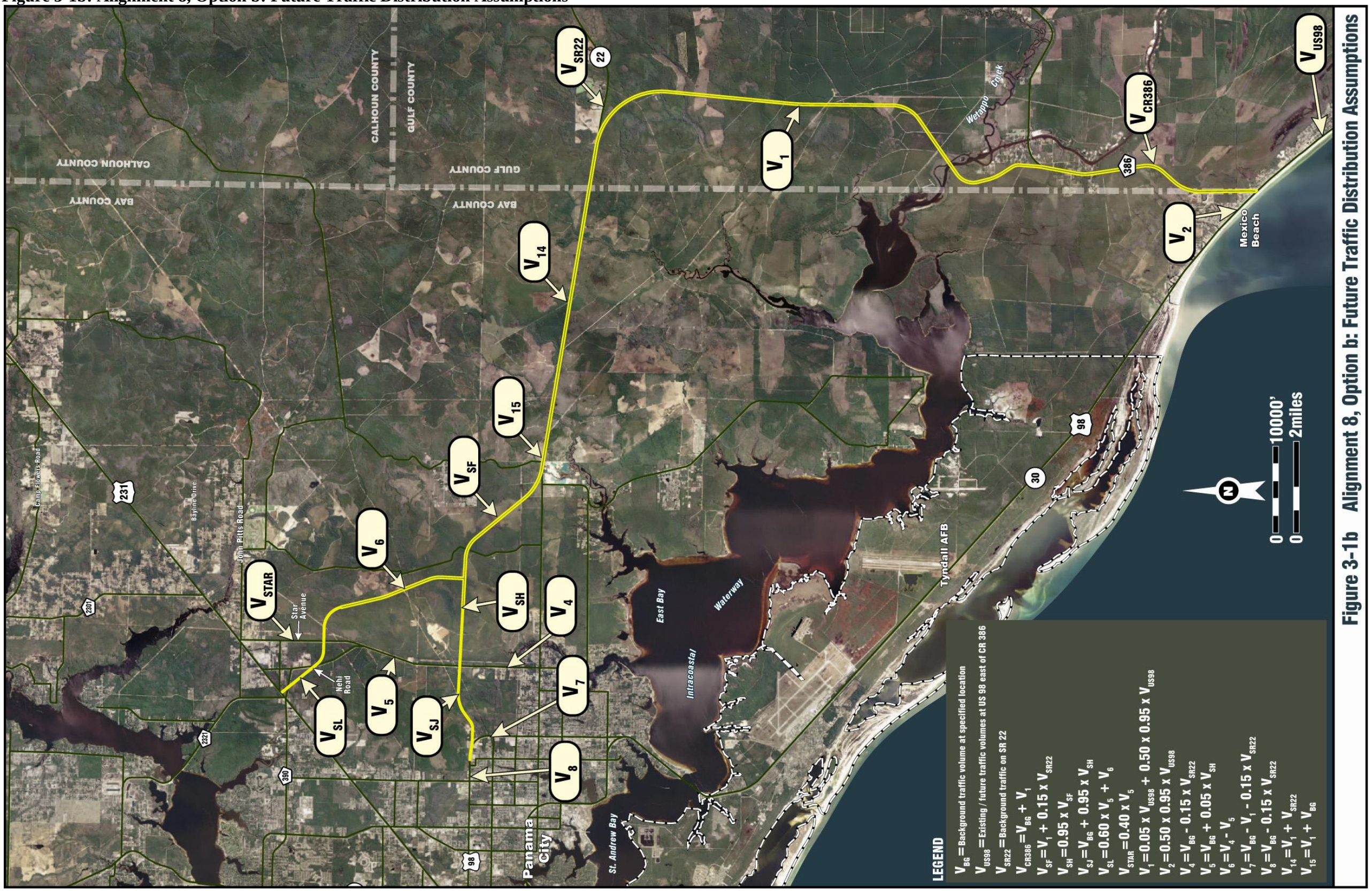


Figure 3-1c: Alignment 8, Option c: Future Traffic Distribution Assumptions

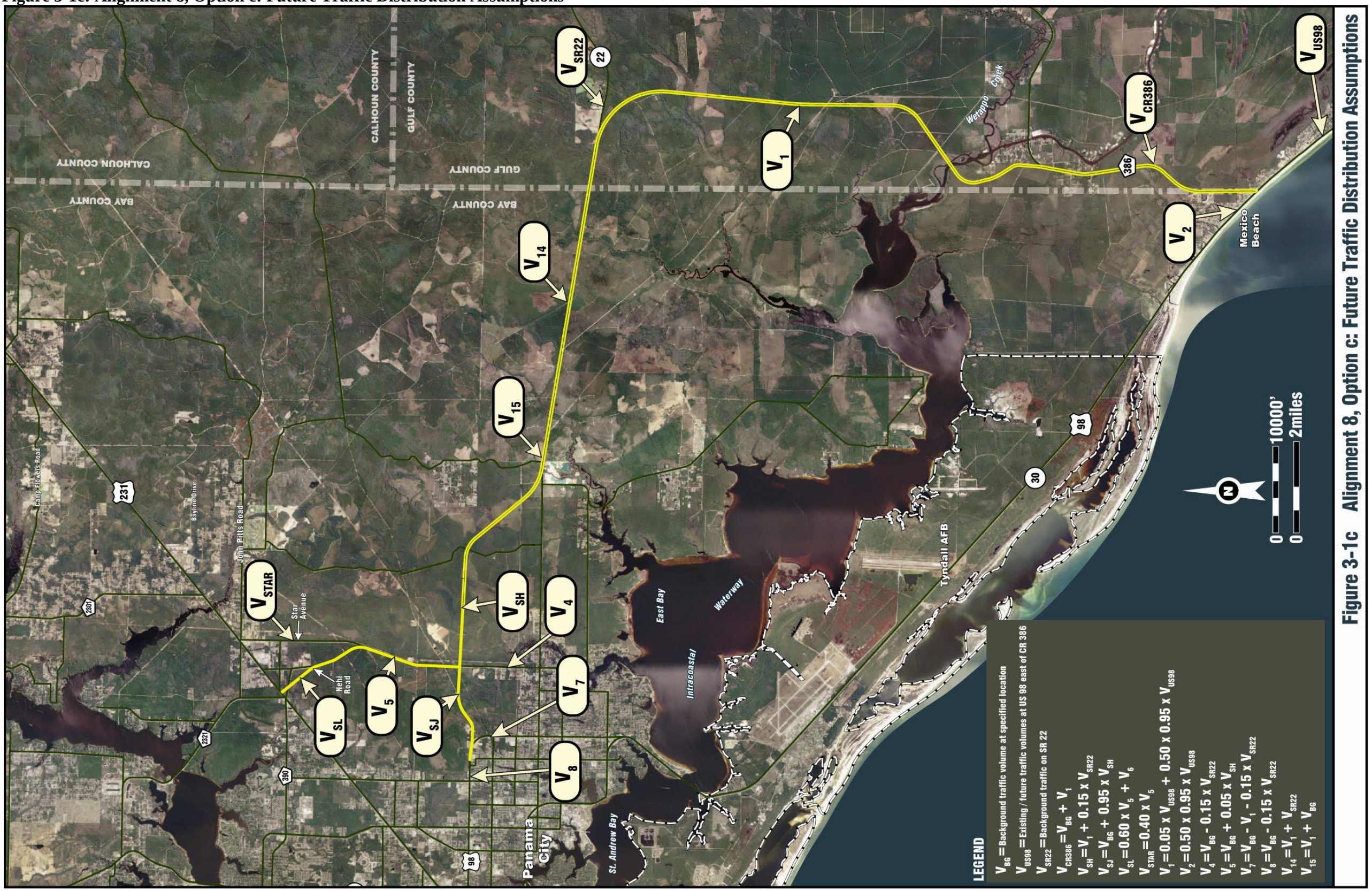


Figure 3-1d: Alignment 8, Option d: Future Traffic Distribution Assumptions

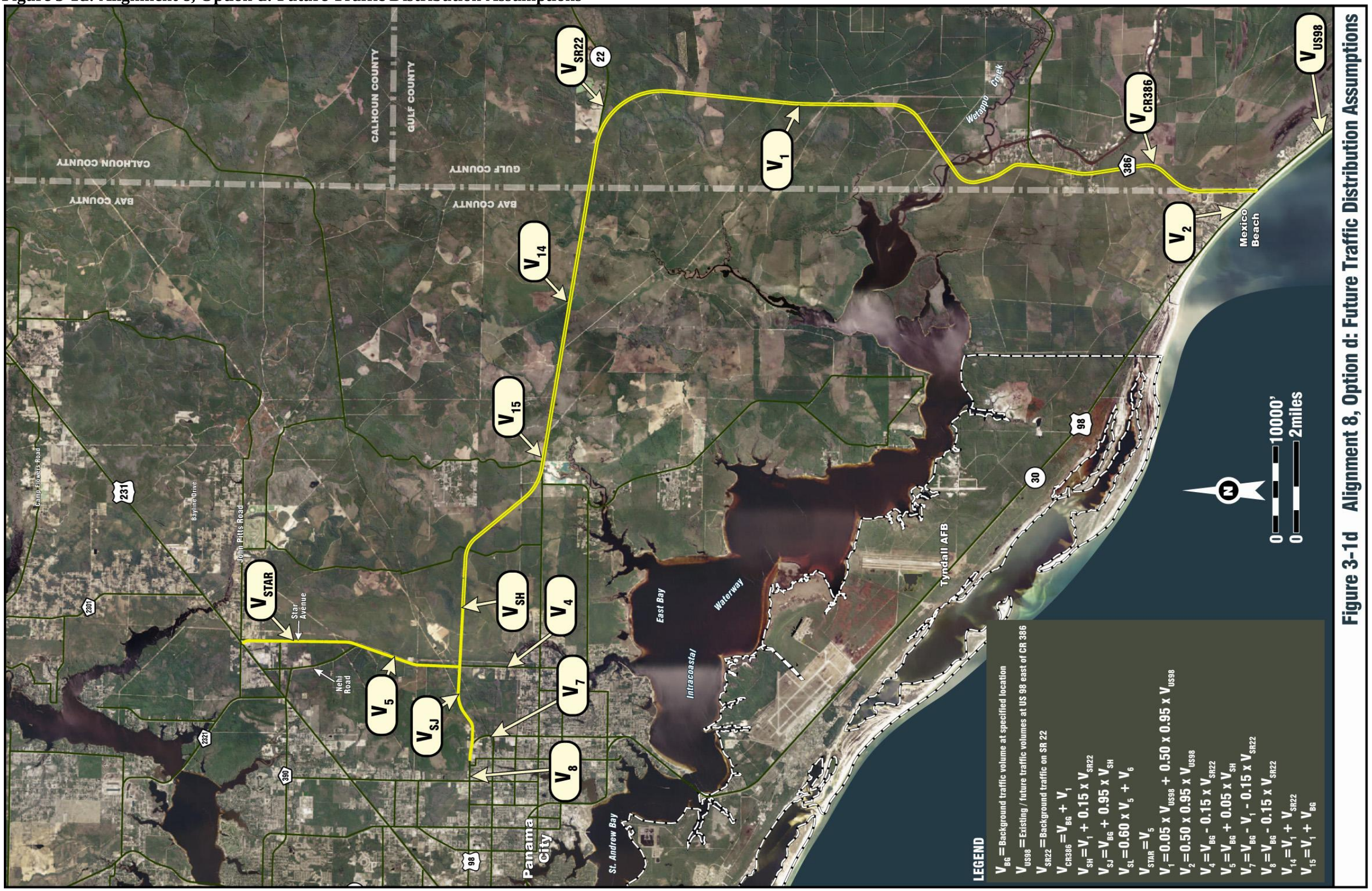


Figure 3-1d Alignment 8, Option d: Future Traffic Distribution Assumptions

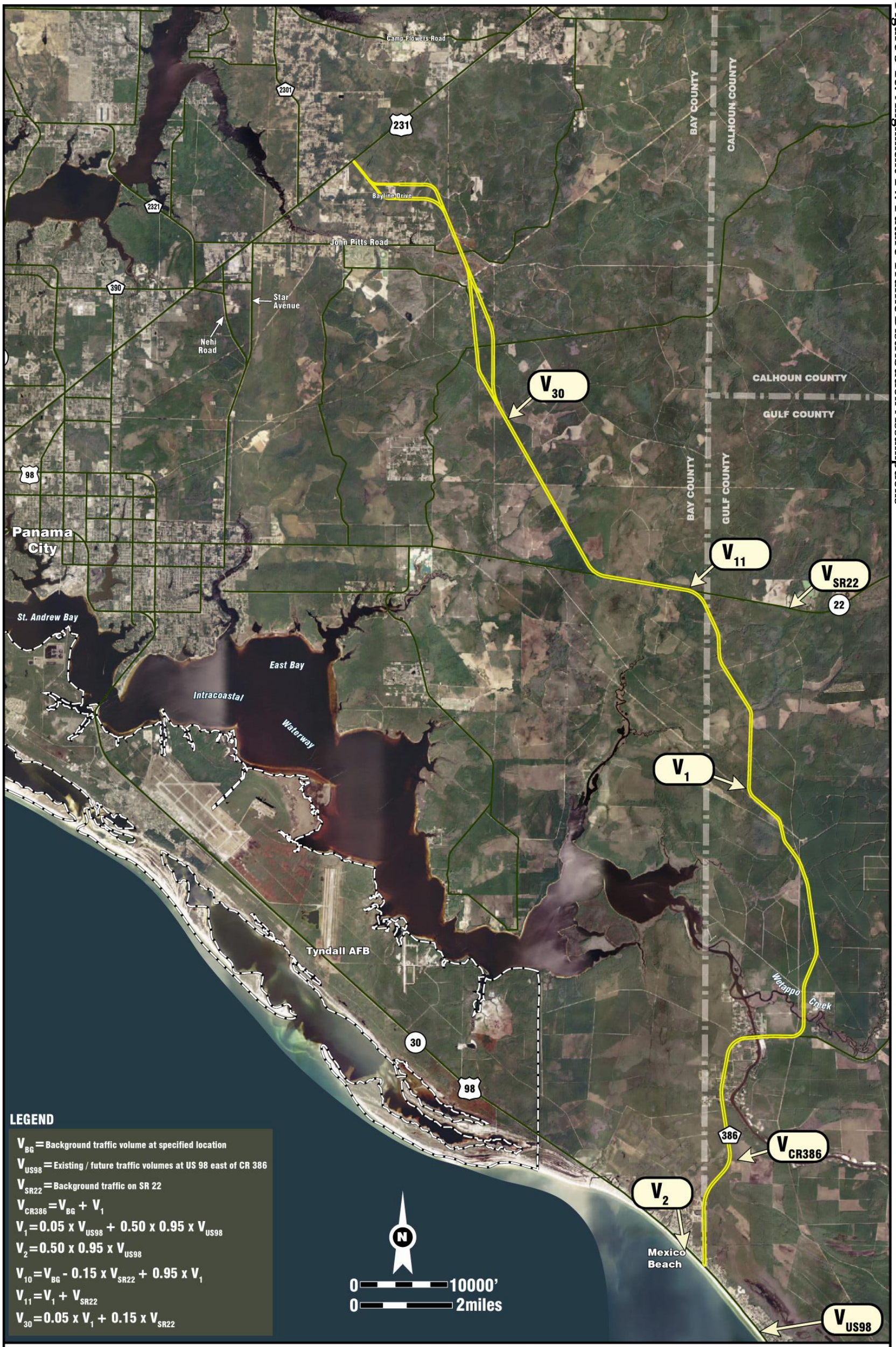


Figure 3-1e Alignment 14: Future Traffic Distribution Assumptions

Figure 3-1f: Alignment 15: Future Traffic Distribution Assumptions

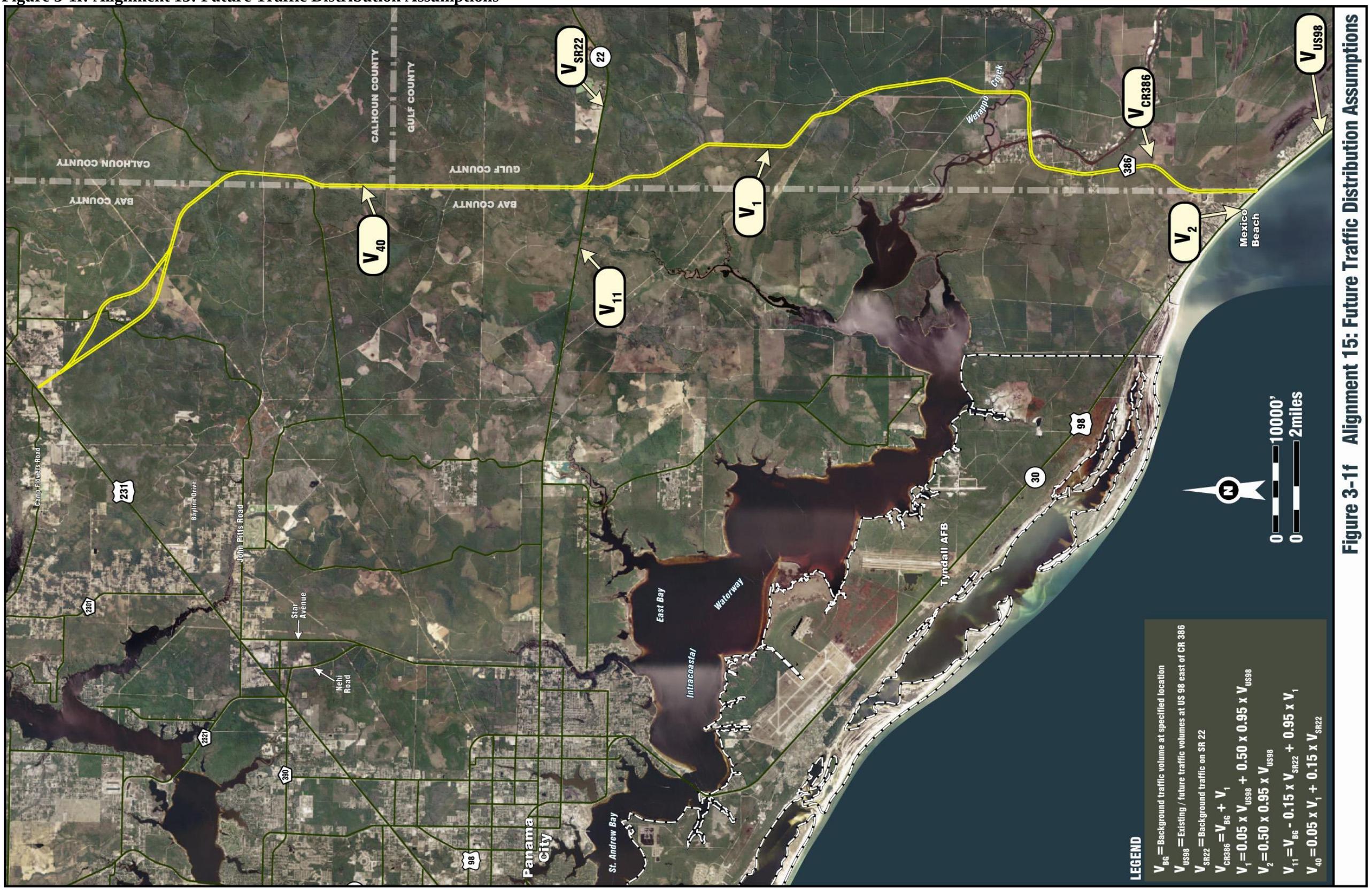


Figure 3-1g: Alignment 17, Option a: Future Traffic Distribution Assumptions

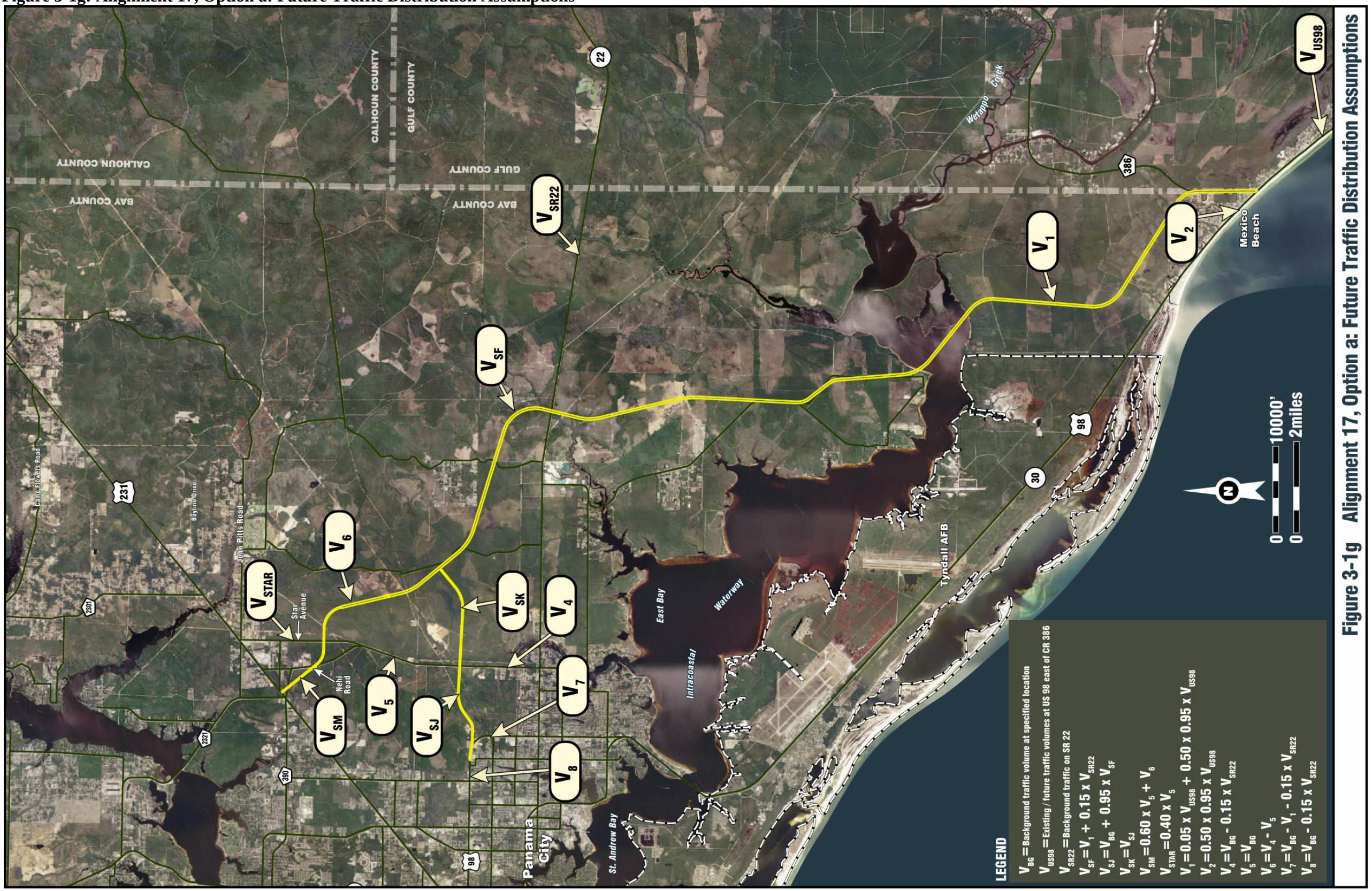


Figure 3-1h: Alignment 17, Option b: Future Traffic Distribution Assumptions

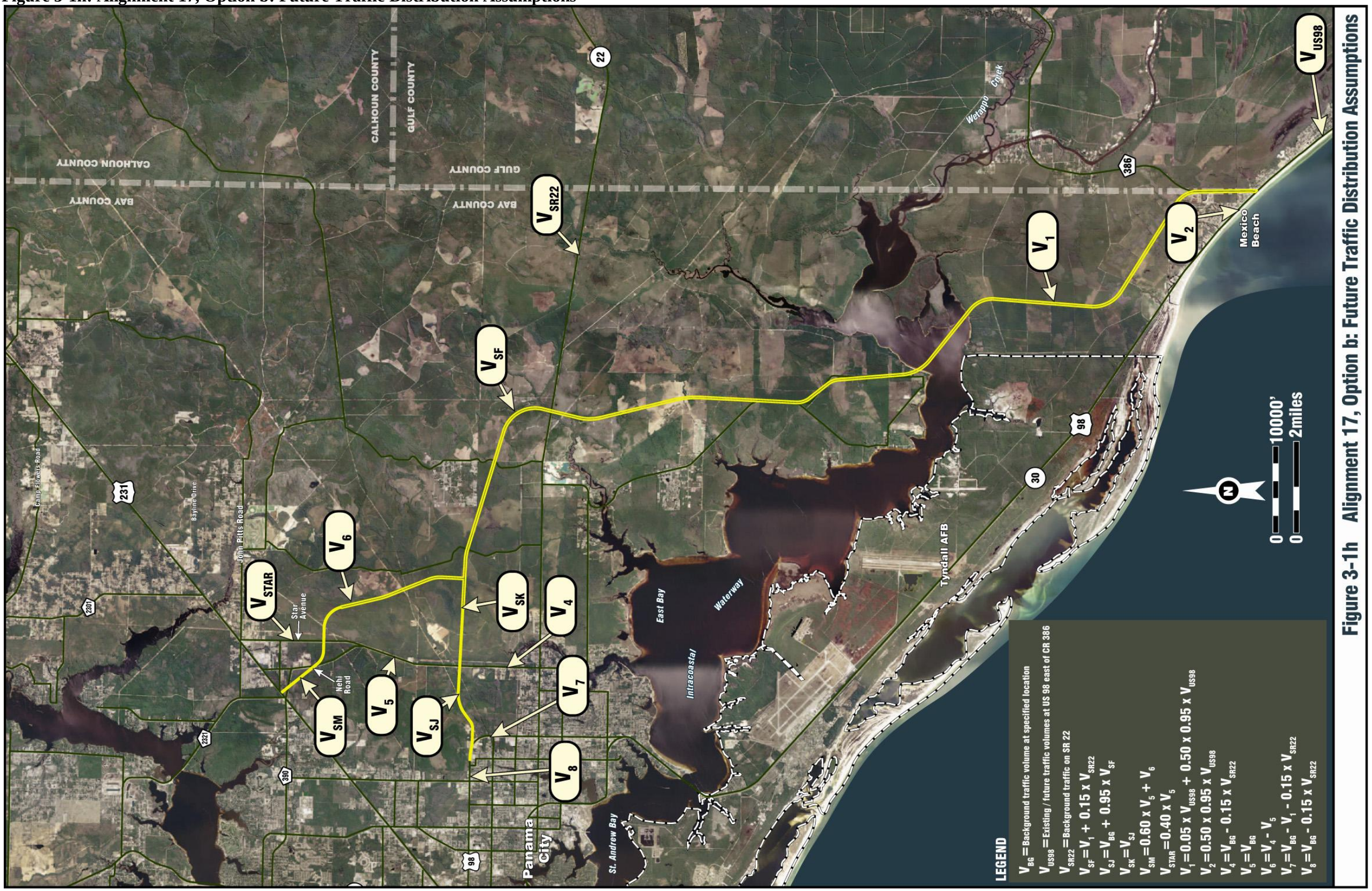


Figure 3-1i: Alignment 17, Option c: Future Traffic Distribution Assumptions

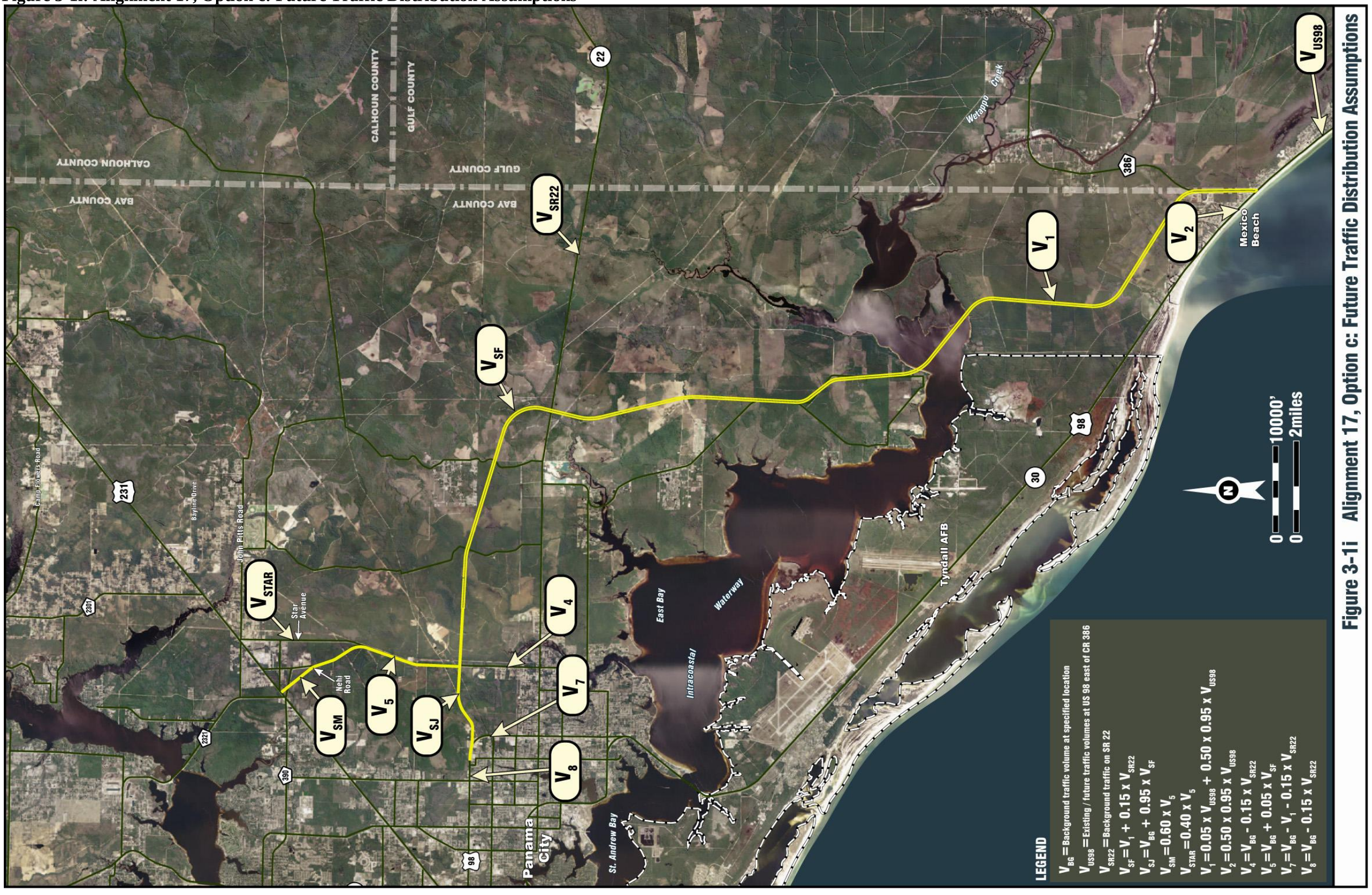


Figure 3-1i Alignment 17, Option c: Future Traffic Distribution Assumptions

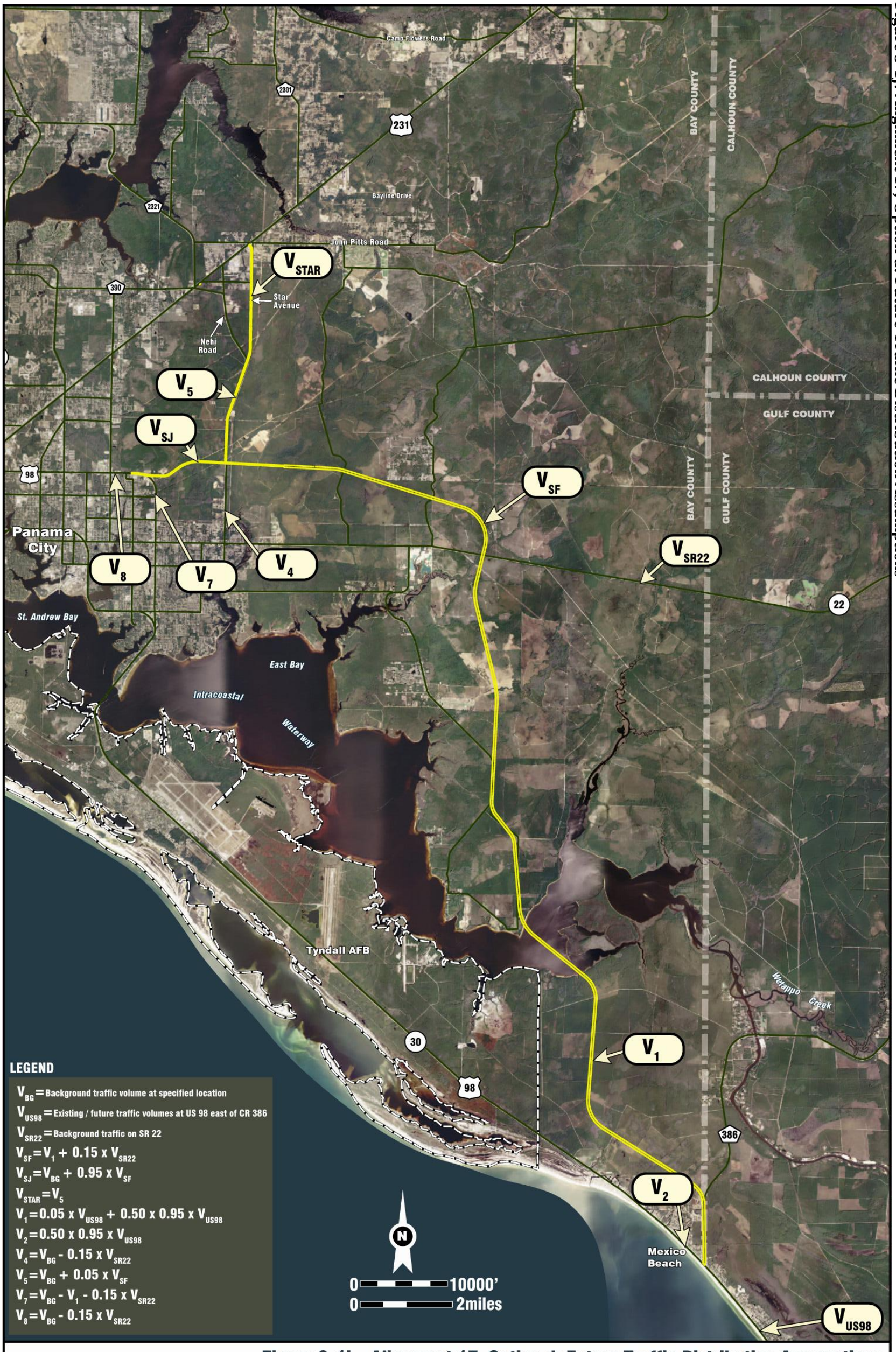
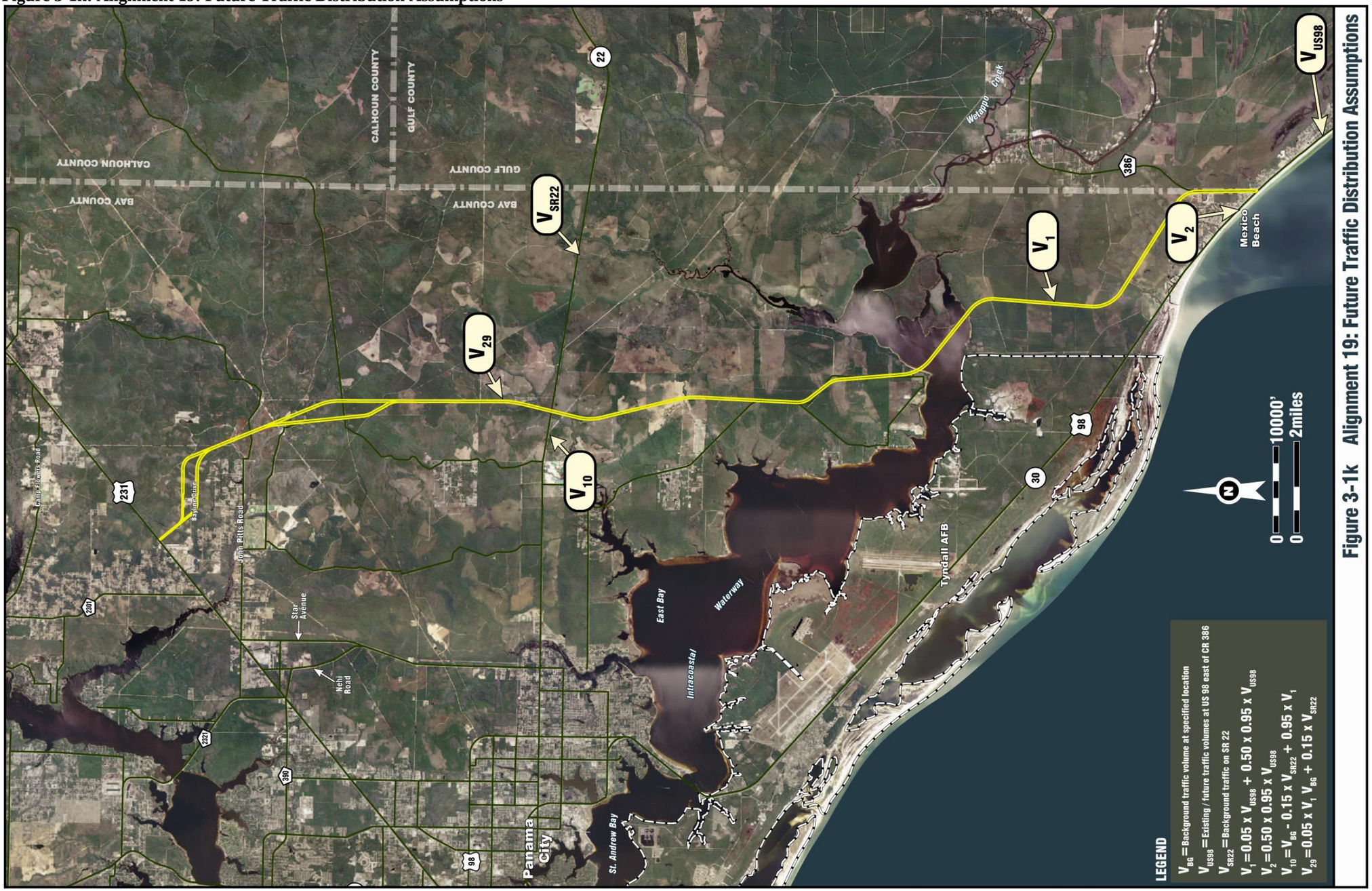


Figure 3-1j Alignment 17, Option d: Future Traffic Distribution Assumptions

Figure 3-1k: Alignment 19: Future Traffic Distribution Assumptions



3.1.3 Traffic Factors

The same traffic factors developed for the existing year will be used in all future years. The uncertainties linked to the future land use along the corridor, and the use of area-wide average of parameters, make this determination reasonable. It is also in agreement with FDOT guidelines, which basically is centered on an accurate estimate of K_{30}, D, and T for the current roadway system because it will be a reasonable estimate of them for the design year.

3.2 OPENING AND DESIGN YEAR DAILY TRAFFIC VOLUMES

Table 3-3 provides a summary of the FDOT historical traffic growth rate and the results of the trend analysis using the past 10-year period of traffic data for the most relevant count stations in the study area.

Table 3-3: Historical and Future Traffic Growth Rates from FDOT Database

Count Station	Location	Data Available Since	Historic Traffic Annual Percent Growth 1995-2004	Year 2004 AADT	Traffic Trend Growth Rate (2004-2032)
460215	CR 386 300' North of US 98	2001	0.00%	1,300	-1.65%
510101	CR 386 300' West of SR 71 South of SR 22	1974	5.13%	950	5.45%
511601	SR 71 South City Limits of Wewahitchka	1970	6.17%	5,600	1.15%
511603	SR 71 100' North of SR 22	1970	3.07%	6,000	1.25%
511602	SR 22 1.0 miles West of SR 71	1970	1.33%	2,800	2.55%
460260	SR 22 300' East of Allanton Rd	1970	1.17%	4,200	-0.09%
461625	SR 22 50' East of Callaway Bayou Bridge	1970	5.44%	7,300	3.08%
465189	SR 22 300' West of Star Avenue	2000	0.77%	13,400	1.39%
465195	SR 22 300' East of US 98	1974	3.65%	19,400	2.67%
510007	US 98 2.0 miles North of SR 382 N. of St. Joe	1974	1.37%	7,300	1.96%
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	1970	1.72%	6,700	2.45%
461624	US 98 300' North of East Bay (Tyndall) Bridge	1974	-0.65%	24,000	-0.24%
465194	US 98 T. PKWY. 300 S. of SR 22	1977	1.88%	34,500	1.48%
465193	US 98 300' North of SR 22	1977	3.46%	40,000	2.10%
465161	US 98 300' East of Transmitter Road	1976	3.47%	31,500	1.75%
*465038	US 98 300' East of SR 77	1974	5.84%	30,360	1.12%
*460305	US 98 250' West of Hathaway Bridge	1995	2.53%	60,000	1.32%
465169	US 231 (1.09 miles West of Transmitter Rd	1974	5.23%	25,000	1.64%
461630	US 231 (845' East of Transmitter Rd.)	1977	6.10%	28,500	2.57%
460084	US 231 (500' West of Star Av.)	2000	1.74%	23,000	1.71%
460082	US 231 (1.0 Mile East of Star Av.)	1971	1.03%	23,500	2.86%
461623	Transmitter Rd (800' North of US 98)	1970	1.74%	15,500	1.20%
461621	Transmitter Rd (300' South of US 231)	1970	2.47%	11,000	0.32%
461631	CR 390 (300' West of US 231)	1977	6.42%	7,100	3.02%
460291	CR 2321 (300' North-northwest of US 231)	1988	2.86%	4,400	1.95%
460266	CR 2293 (John Pitts Rd., 300' East of Star Av.)	1970	1.31%	3,800	0.75%
	Annual Average Traffic Growth Rate, Areawide		2.96%		1.68%
	Annual Average Traffic Growth Rate, US 98 only		2.45%		1.49%
	Annual Average Traffic Growth Rate, US 231 only		3.53%		2.20%

Sources: Calculated from 2004 FDOT Traffic Data CD
Notes: * FDOT permanent count station
Historical annual percent growth rate calculated for the last 10 years only

Population historical data and estimated future trends are summarized in Table 3-4 and Table 3-5.

Table 3-4: Population in Gulf County and Bay County, Historical Growth Rates

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Average Annual Growth Rate (1992-2002)
Population (1,000)	137.3	139.0	141.9	144.6	147.0	148.7	150.8	152.5	154.3	156.3	**1.4%**

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Average Annual Growth Rate (1992-2002)
Population (1,000)	12.9	13.0	13.2	13.3	13.6	14.7	15.1	15.2	15.3	15.4	**1.9%**

Source: University of Florida, Bureau of Economic and business Research, Florida Long-term Economic Forecast 2002. Counties (1998-2004)

Table 3-5: Population in Gulf and Bay Counties, Future Growth Rates

Projection	Population Estimates (x 1000)						Average Annual Growth Rate (2001-2030)
Year	2002	2010	2015	2020	2025	2030	
Bay County	152.5						
Low		151.0	150.8	149.7	147.5	144.0	-0.2%
Medium		166.5	175.2	183.9	192.4	200.0	1.1%
High		184.5	204.0	224.5	245.8	267.5	2.7%
Gulf County	15.2						
Low		14.2	13.6	13.0	12.4	11.6	-0.8%
Medium		16.0	16.5	17.0	17.4	17.8	0.6%
High		18.0	19.6	21.2	22.9	24.7	2.2%

Source: University of Florida, Bureau of Economic and Business Research (BEBR): Florida Statistical Abstract 2003

Population projections are expected to be higher than the medium range estimated by the BEBR from the University of Florida, considering the number of land use developments being planned for this area. Traffic projections in the past had outpaced population growth as well, so the area-wide traffic growth rate calculated in Table 3-3, rounded to 2.0% is adopted as the GCP corridor traffic rate of growth.

DRIs proposed in the area were also considered in the projection of future traffic. At the time of this study, the WindMark development, the West Bay Specific Area Plan (SAP), and the future relocation of the Panama City airport are the only well known DRIs within proximity to the project that could create significant impact on the transportation network.
WindMark is a mixed-use development planned by the St. Joe Company, located east of CR 386 along US 98 in Gulf County. Phase I of the project was scheduled for completion in 2009 and Phase II for completion in 2014. Traffic generation analysis of this DRI was available for the

GCP Corridor Feasibility Study and used again here. Trips associated with Phase I were applied to the GCP's opening year 2012 and the full traffic from his DRI was applied to the interim and design years.

The West Bay SAP is a conceptual plan addressing future mixed-use developments and the proposed new Panama City airport. This project is located north of CR 388, south of SR 20, and east of SR 79. As per West Bay SAP report, about 8% of the expected traffic to be generated will be affecting the transportation system by the GCP's opening year of 2012, 71% would occur by 2022, and the full amount in GCP's design year of 2032.

Table 3-6 provides a summary of the respective DRIs traffic, using the *GCP Corridor Feasibility Report* timeline. Table 3-7 shows the AADT traffic volumes for existing and all future years, including the background and DRI traffic. Figures 3-2a to 3-2k also show the AADT traffic volumes.

Table 3-6: Estimated Traffic (AADT) from DRIs in the Study Area

Count Station	Location	Annual Growth Trend Rate (2002-2027)	Year 2002 AADT	West Bay DRI Traffic			New PC Airport Traffic			Windmark DRI Traffic		
				Year 2007	Year 2017	Year 2027	Year 2007	Year 2017	Year 2027	Year 2007	Year 2017	Year 2027
	Bay County											
460269	Star Avenue 500' North of SR 22	1.85%	6,200	61	76	94	27	34	42	0	0	0
465195	SR 22 300' East of US 98	3.00%	17,200	788	981	1221	154	191	238	0	0	0
465189	SR 22 300 West of Star Avenue	1.78%	13,500	788	981	1221	154	191	238	0	0	0
461625	SR 22 50 East of Callaway Bayou Bridge	3.88%	6,600	721	898	1117	127	158	197	0	0	0
*460305	US 98 250' West of Hathaway Bridge	1.60%	57,034	2561	3188	3968	0	0	0	0	0	0
465193	US 98 300' North of SR 22	2.43%	36,000	1215	1513	1883	207	258	321	0	0	0
465194	US 98 T. PKWY. 300 S. of SR 22	2.34%	35,000	414	515	641	53	66	83	0	0	0
460214	US 98 1.3 miles Southeast of TAFB Main Entrance	0.18%	6,500	1277	1589	1978	61	76	94	315	391	391
460082	US 231 (1.0 mile East of Star Av.)			2512	3127	3892	139	173	215	0	0	0
N/A	US 231 West of Star Ave			1223	1523	1896	139	173	215	0	0	0
N/a	US 231 West of CR 390			563	701	873	137	170	212	0	0	0
461631	CR 390 (300' West of US 231)			1135	1413	1759	137	170	212	0	0	0
460291	CR 2321 (300' North-northwest of US 231)			1803	2245	2794	134	167	208	0	0	0
	Gulf County											
N/A	US 98 East of CR 386	1.52%		638	794	989	61	76	94	781	982	982
510007	US 98 2.0 miles North of SR 382 N. of St. Joe	1.92%	7,900	56	435	620	0	0	0	1860	2343	2343
N/A	CR386 – US 98 to the North	0.50%	1,508	0	40	56	0	0	0	515	652	652
510101	CR 386 300' West of SR 71South of SR 22	2.15%	1,300	0	16	16	0	0	0	0	0	0
511601	SR 71 South City limits of Wewahitchika	1.85%	4,800	0	0	0	0	0	0	0	0	0
511603	SR 71 100' North of SR 22	0.55%	5,800	0	0	0	0	0	0	0	0	0
511602	SR 22 1.0 mile West of SR 71	1.21%	3,300	473	589	733	141	175	218	0	0	0
	Average Annual Growth Rate	2.21%										

Source: Gulf Coast Parkway Feasibility Study

Notes:

* FDOT permanent count station

The build out condition for traffic, as estimated in the respective DRI studies, was set to the year 2022 (West Bay and New Airport) and 2014 for WindMark

They were adjusted in the GCP Feasibility report to the years shown in the headings (2007, 2017, 2027)

Table 3-7a: Future Traffic (Including DRI traffic): Alternative 8, Option a

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 1				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 3	1,900	9,314	11,422	13,735
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 3	North of Overstreet (CR 386, Gulf Co.)	0	7,114	8,722	10,535
CR 386	West of GCP, Segment 3 (Gulf Co.)	1,900	9,314	11,422	13,735
CR 386	East of GCP, Segment 3 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3,8,10,14,15				
GCP, Seg. 3,8,10	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 3,8,10	South of SR 22	0	7,114	8,722	10,535
SR 22	East of GCP, Segment 10	2,900	3,914	4,864	5,851
SR 22	West of GCP, Segment 10	3,300	11,528	14,086	16,986
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	12,528	15,386	18,586
SR 22	CR 2297 - GCP, Segment 14,15	10,300	19,528	23,886	28,986
SR 22	East of GCP, Segment 15	10,300	19,528	23,886	28,986
SR 22	West of GCP, Segment 15	10,300	11,042	13,472	16,359
GCP, Seg. 15,20	North of SR 22	0	9,528	11,686	13,986
GCP, Seg. 15,20	SR 22 - GCP, Segment 22	0	9,528	11,686	13,986
	Segment 22,25				
GCP, Seg. 20	South of GCP, Seg. 22	0	9,528	11,686	13,986
GCP, Seg 24	North of GCP, Seg. 22	0	3,126	3,834	4,507
GCP, Seg. 22	East of Star Ave	0	9,214	11,343	13,643
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	6,588	8,009	9,836
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segment 24				
Star Ave, S. of Seg. 24	Tram Rd - GCP, Seg 24	7,300	6,588	8,009	9,836
GCP, Seg 24	East of Star Ave	0	3,126	3,834	4,507
Star Ave	North of GCP, Segment 24	8,200	3,588	4,409	5,336
GCP, Seg 24	West of Star Ave	0	6,214	7,543	9,143
GCP, Seg 24	Star Ave - US 231	0	6,214	7,543	9,143
US 231	West, South west of GCP, Seg. 24	25,400	29,900	36,471	44,485
US 231	East, Northeast of GCP, Seg. 24	29,900	35,662	43,596	53,111
GCP, Seg. 24	South of US 231	0	6,214	7,543	9,143

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7b: Future Traffic (Including DRI traffic): Alternative 8, Option b

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 1				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 3	1,900	9,314	11,422	13,735
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 3	North of Overstreet (CR 386, Gulf Co.)	0	7,114	8,722	10,535
CR 386	West of GCP, Segment 3 (Gulf Co.)	1,900	9,314	11,422	13,735
CR 386	East of GCP, Segment 3 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3,8,10,14,15				
GCP, Seg. 3,8,10	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 3,8,10	South of SR 22	0	7,114	8,722	10,535
SR 22	East of GCP, Segment 10	2,900	3,914	4,864	5,851
SR 22	West of GCP, Segment 10	3,300	11,528	14,086	16,986
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	12,528	15,386	18,586
SR 22	CR 2297 - GCP, Segment 14,15	10,300	19,528	23,886	28,986
SR 22	East of GCP, Segment 15	10,300	19,528	23,886	28,986
SR 22	West of GCP, Segment 15	10,300	11,042	13,472	16,359
GCP, Seg. 15,17	North of SR 22	0	9,528	11,686	13,986
GCP, Seg. 15,17	SR 22 - GCP, Segment 21	0	9,528	11,686	13,986
	Segment 21,25				
GCP, Seg. 17	East of GCP, Seg. 23	0	9,528	11,686	13,986
GCP, Seg 23	North of GCP, Seg. 17,21	0	3,126	3,834	4,507
GCP, Seg. 21	East of Star Ave	0	9,214	11,343	13,643
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	6,588	8,009	9,836
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200

Table 3-7b: Future Traffic (Including DRI traffic): Alternative 8, Option b (Cont.)

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 23				
Star Ave, South of Seg. 23	Tram Rd - GCP, Seg 23	7,300	6,588	8,009	9,836
GCP, Seg 23	East of Star Ave	0	3,126	3,834	4,507
Star Ave	North of GCP, Segment 23	8,200	3,588	4,409	5,336
GCP, Seg 23	West of Star Ave	0	6,214	7,543	9,143
GCP, Seg 23	Star Ave - US 231	0	6,214	7,543	9,143
US 231	West, South west of GCP, Seg. 23	25,400	29,900	36,471	44,485
US 231	East, Northeast of GCP, Seg. 23	29,900	35,662	43,596	53,111
GCP, Seg. 23	South of US 231	0	6,214	7,543	9,143

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7c: Future Traffic (Including DRI traffic): Alternative 8, Option c

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 1				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 3	1,900	9,314	11,422	13,735
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 3	North of Overstreet (CR 386, Gulf Co.)	0	7,114	8,722	10,535
CR 386	West of GCP, Segment 3 (Gulf Co.)	1,900	9,314	11,422	13,735
CR 386	East of GCP, Segment 3 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3, 8, 10, 14, 15				
GCP, Seg 3,8,10	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg 3,8,10	South of SR 22	0	7,114	8,722	10,535
SR 22	East of GCP, Segment 10	2,900	3,914	4,864	5,851
SR 22	West of GCP, Segment 10	3,300	11,528	14,086	16,986
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	12,528	15,386	18,586
SR 22	CR 2297 - GCP, Segment 14,15	10,300	19,528	23,886	28,986
SR 22	East of GCP, Segment 15	10,300	19,528	23,886	28,986
SR 22	West of GCP, Segment 15	10,300	11,042	13,472	16,359
GCP, Seg. 15,17,21	North of SR 22	0	9,528	11,686	13,986
	Segments 17,21				
GCP, Seg. 17,21	SR 22 - Tram Road	0	9,528	11,686	13,986
GCP, Seg. 17,21	East of Star Ave	0	9,528	11,686	13,986
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	9,714	11,843	14,343
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segments 26,27				
GCP, Seg. 26	Tram Rd - Nehi Rd.	7,300	9,714	11,843	14,343
GCP, Seg 26	South of Nehi-Star Ave intersection	7,300	9,714	11,843	14,343
Star Ave	North of GCP, Segment 26,27	8,200	3,588	4,409	5,336
GCP, Seg 27	Northwest of Nehi-Star Ave intersection	0	6,214	7,543	9,143
GCP, Seg 27	Star Ave - US 231	0	6,214	7,543	9,143
US 231	West, South west of GCP, Seg. 27	25,400	29,900	36,471	44,485
US 231	East, Northeast of GCP, Seg. 27	29,900	35,662	43,596	53,111
GCP, Seg. 27	South of US 231	0	6,214	7,543	9,143

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7d: Future Traffic (Including DRI traffic): Alternative 8, Option d

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 1				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 3	1,900	9,314	11,422	13,735
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 3	North of Overstreet (CR 386, Gulf Co.)	0	7,114	8,722	10,535
CR 386	West of GCP, Segment 3 (Gulf Co.)	1,900	9,314	11,422	13,735
CR 386	East of GCP, Segment 3 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3, 8, 10, 14, 15				
GCP, Seg 3,8,10	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg 3,8,10	South of SR 22	0	7,114	8,722	10,535
SR 22	East of GCP, Segment 10	2,900	3,914	4,864	5,851
SR 22	West of GCP, Segment 10	3,300	11,528	14,086	16,986
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	12,528	15,386	18,586
SR 22	CR 2297 - GCP, Segment 14,15	10,300	19,528	23,886	28,986
SR 22	East of GCP, Segment 15	10,300	19,528	23,886	28,986
SR 22	West of GCP, Segment 15	10,300	11,042	13,472	16,359
GCP, Seg. 15,17,21	North of SR 22	0	9,528	11,686	13,986
	Segments 17,21				
GCP, Seg. 17,21	SR 22 - Tram Road	0	9,528	11,686	13,986
GCP, Seg. 17,21	East of Star Ave	0	9,528	11,686	13,986
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	9,714	11,843	14,343
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segments 26,28				
GCP, Seg. 26	Tram Rd - Nehi Rd.	7,300	9,714	11,843	14,343
Star Ave (GCP Seg. 28)	Segment 28 North of GCP, Seg. 26	8,200	9,714	11,843	14,343
GCP, Seg 28	South of John Pitts Road	8,200	9,714	11,843	14,343
John Pitts Road	East of Star Ave (GCP, Seg. 28)	3900	4,500	5,500	6,700
GCP, Seg 28	North of John Pitts Road	8,200	10,314	12,643	15,343
US 231	West, South west of GCP, Seg. 28	29,900	35,662	43,596	53,111
US 231	East, Northeast of GCP, Seg. 28	28,800	34,462	41,996	51,311
GCP, Seg. 28	South of US 231	8,200	10,314	12,643	15,343

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts
Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7e: Future Traffic (Including DRI traffic): Alternative 14

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segments 1, 4				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 4	1,900	9,314	11,422	13,735
CR 386	GCP Segment 4 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 4	North of Overstreet (CR 386, Gulf Co.)	0	7,114	8,722	10,535
CR 386	West of GCP, Segment 4 (Gulf Co.)	1,900	9,314	11,422	13,735
CR 386	East of GCP, Segment 4 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segment 4, 5, 9, 11				
GCP, Seg 4, 5, 9	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg 9	South of SR 22	0	7,114	8,722	10,535
SR 22	East of GCP, Segment 9	2,900	3,914	4,864	5,851
SR 22	West of GCP, Segment 9	3,300	11,028	13,586	16,386
SR 22	West of GCP, Segment 11	4,200	10,972	13,457	16,331
GCP, Seg. 30	North of SR 22	0	943	1,166	1,404
	Segment 30				
GCP, Seg. 30	SR 22 - US 231	7,300	943	1,166	1,404
GCP, Seg 30	South of US 231	7,300	943	1,166	1,404
US 231	Star Ave to the east	18,150	22,162	27,096	33,111
US 231	US 231 (1,480' South of CR 388 at Youngstown)	15,700	19,362	23,696	28,911

Sources:

Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7f: Future Traffic (Including DRI traffic): Alternative 15

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segments 1, 4				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 4	1,900	9,314	11,422	13,735
CR 386	GCP Segment 4 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 4	North of Overstreet (CR 386, Gulf Co.)	0	7,114	8,722	10,535
CR 386	West of GCP, Segment 4 (Gulf Co.)	1,900	9,314	11,422	13,735
CR 386	East of GCP, Segment 4 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segment 4, 5, 9				
GCP, Seg 4, 5, 9	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg 9	South of SR 22	0	7,114	8,722	10,535
SR 22	East of GCP, Segment 9	2,900	3,914	4,864	5,851
SR 22	West of GCP, Segment 9	3,300	9,972	12,157	14,731
GCP, Seg. 13, 40	North of SR 22	0	943	1,166	1,404
	Segment 13, 40, 41, 42				
GCP, Seg. 13, 40, 41, 42	SR 22 - US 231	7,300	943	1,166	1,404
GCP, Seg 41, 42	South of US 231	7,300	943	1,166	1,404
US 231	North of Campflower Road	15,700	19,362	23,696	28,911
US 231	US 231 (1480' South of CR 388 at Youngstown)	15,700	19,362	23,696	28,911

Sources:

Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7g: Future Traffic (Including DRI traffic): Alternative 17, Option a

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 2				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 2	1,900	9,314	11,422	13,735
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,114	8,722	10,535
CR 386	South of GCP, Segment 2	1,900	9,314	11,422	13,735
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 16, 19				
GCP, Seg. 2	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 2	South of SR 22	0	7,114	8,722	10,535
SR 22	CR 2297 to the east	10,300	13,628	16,686	20,286
SR 22	East of GCP, Segment 2	10,300	13,628	16,686	20,286
SR 22	West of GCP, Segment 2	10,300	11,042	13,472	16,359
GCP, Seg. 16	North of SR 22	0	9,528	11,686	13,986
GCP, Seg. 16, 19	SR 22 - Segment 22	0	9,528	11,686	13,986
	Segment 22				
GCP, Seg. 19	South of Seg. 22	0	9,528	11,686	13,986
GCP, Seg 24	North of Seg. 22	0	3,126	3,834	4,507
GCP, Seg. 22	East of Star Ave	0	9,214	11,343	13,643
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	6,588	8,009	9,836
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segment 24				
Star Ave, S. of Seg. 24	Tram Rd - Seg 24	7,300	6,588	8,009	9,836
GCP, Seg 24	East of Star Ave	0	3,126	3,834	4,507
Star Ave	North of GCP, Segment 24	8,200	3,588	4,409	5,336
GCP, Seg 24	West of Star Ave	0	6,214	7,543	9,143
GCP, Seg 24	Star Ave - US 231	0	6,214	7,543	9,143
US 231	West, South west of GCP, Seg. 24	25,400	29,900	36,471	44,485
US 231	East, Northeast of GCP, Seg. 24	29,900	35,662	43,596	53,111
GCP, Seg. 24	South of US 231	0	6,214	7,543	9,143

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7h: Future Traffic (Including DRI traffic): Alternative 17, Option b

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 2				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 2	1,900	9,314	11,422	13,735
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,114	8,722	10,535
CR 386	South of GCP, Segment 2	1,900	9,314	11,422	13,735
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 16, 18				
GCP, Seg. 2	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 2	South of SR 22	0	7,114	8,722	10,535
SR 22	CR 2297 to the east	10,300	13,628	16,686	20,286
SR 22	East of GCP, Segment 2	10,300	13,628	16,686	20,286
SR 22	West of GCP, Segment 2	10,300	11,042	13,472	16,359
GCP, Seg. 16	North of SR 22	0	9,528	11,686	13,986
GCP, Seg. 16, 18	SR 22 - Segment 23	0	9,528	11,686	13,986
	Segment 21				
GCP, Seg. 18	East of Seg. 23	0	9,528	11,686	13,986
GCP, Seg 23	North of Seg. 21	0	3,126	3,834	4,507
GCP, Seg. 21	East of Star Ave	0	9,214	11,343	13,643
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	6,588	8,009	9,836
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segment 23				
Star Ave, S. of Seg. 23	Tram Rd - Seg 23	7,300	6,588	8,009	9,836
GCP, Seg 23	East of Star Ave	0	3,126	3,834	4,507
Star Ave	North of GCP, Segment 23	8,200	3,588	4,409	5,336
GCP, Seg 23	West of Star Ave	0	6,214	7,543	9,143
GCP, Seg 23	Star Ave - US 231	0	6,214	7,543	9,143
US 231	West, South west of GCP, Seg. 23	25,400	29,900	36,471	44,485
US 231	East, Northeast of GCP, Seg. 23	29,900	35,662	43,596	53,111
GCP, Seg. 23	South of US 231	0	6,214	7,543	9,143

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7i: Future Traffic (Including DRI traffic): Alternative 17, Option c

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 2				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 2	1,900	9,314	11,422	13,735
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,114	8,722	10,535
CR 386	South of GCP, Segment 2	1,900	9,314	11,422	13,735
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 16, 18, 21				
GCP, Seg. 2	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 2	South of SR 22	0	7,114	8,722	10,535
SR 22	CR 2297 - to the east	10,300	13,628	16,686	20,286
SR 22	East of GCP, Segment 2	10,300	13,628	16,686	20,286
SR 22	West of GCP, Segment 2	10,300	11,042	13,472	16,359
GCP, Seg. 16	North of SR 22	0	9,528	11,686	13,986
GCP, Seg. 16, 18, 21	SR 22 - Star Ave	0	9,528	11,686	13,986
GCP, Seg. 21	East of Star Ave	0	9,528	11,686	13,986
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	9,714	11,843	14,343
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segment 26, 27				
Star Ave, S. of Seg. 27	Tram Rd - Seg 27	7,300	9,714	11,843	14,343
Star Ave	North of GCP, Segment 27	8,200	3,588	4,409	5,336
GCP, Seg 27	West of Star Ave	0	6,214	7,543	9,143
GCP, Seg 27	Star Ave - US 231	0	6,214	7,543	9,143
US 231	West, South west of GCP, Seg. 27	25,400	29,900	36,471	44,485
US 231	East, Northeast of GCP, Seg. 27	29,900	35,662	43,596	53,111
GCP, Seg. 27	South of US 231	0	6,214	7,543	9,143

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7j: Future Traffic (Including DRI traffic): Alternative 17, Option d

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 2				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 2	1,900	9,314	11,422	13,735
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,114	8,722	10,535
CR 386	South of GCP, Segment 2	1,900	9,314	11,422	13,735
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 16, 18, 21				
GCP, Seg. 2	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 2	South of SR 22	0	7,114	8,722	10,535
SR 22	CR 2297 to the east	10,300	13,628	16,686	20,286
SR 22	East of GCP, Segment 2	10,300	13,628	16,686	20,286
SR 22	West of GCP, Segment 2	10,300	11,042	13,472	16,359
GCP, Seg. 16	North of SR 22	0	9,528	11,686	13,986
GCP, Seg. 16, 18, 21	SR 22 - Star Ave	0	9,528	11,686	13,986
GCP, Seg. 21	East of Star Ave	0	9,528	11,686	13,986
Star Ave	South of GCP (South of Tram Rd.)	7,200	6,588	8,009	9,836
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	9,214	11,343	13,643
Star Ave	North of Tram Rd.	7,300	9,714	11,843	14,343
	Segment 25				
Tram Road	US 98 - Star Ave	900	9,214	11,343	13,643
Tram Road	East of US 98	900	9,214	11,343	13,643
US 98	South of Tram Rd	36,800	34,000	39,000	44,900
US 98	North of Tram Rd.	32,400	34,100	39,500	45,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segment 26, 28				
GCP, Seg. 26	Tram Rd - Nehi Rd.	7,300	9,714	11,843	14,343
Star Ave (GCP Seg. 28)	Segment 28 North of GCP, Seg. 26	8,200	9,714	11,843	14,343
GCP, Seg 28	South of John Pitts Road	8,200	9,714	11,843	14,343
John Pitts Road	East of Star Ave (GCP, Seg. 28)	3,900	4,500	5,500	6,700
GCP, Seg 28	North of John Pitts Road	8,200	10,314	12,643	15,343
US 231	West, South west of GCP, Seg. 28	29,900	35,662	43,596	53,111
US 231	East, Northeast of GCP, Seg. 28	28,800	34,462	41,996	51,311
GCP, Seg. 28	South of US 231	8,200	10,314	12,643	15,343

Sources: Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 3-7k: Future Traffic (Including DRI traffic): Alternative 19

Roadway	Segment	Year 2005 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2022 AADT	Year 2032 AADT
	Segment 2				
US 98	East of CR 386	9,800	12,780	15,552	18,765
US 98	West of CR 386	9,100	5,000	6,100	7,400
CR 386	North of US 98	5,100	13,014	15,822	19,235
CR 386	US 98 - 15th Street	1,700	9,114	11,122	13,435
CR 386	15th Street - GCP Segment 2	1,900	9,314	11,422	13,735
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,114	8,722	10,535
CR 386	South of GCP, Segment 2	1,900	9,314	11,422	13,735
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 29, 33-39				
GCP, Seg. 2	CR 386 - SR 22	0	7,114	8,722	10,535
GCP, Seg. 2	South of SR 22	0	7,114	8,722	10,535
SR 22	CR 2297 to the east	10,300	1,828	2,286	2,686
SR 22	East of GCP, Segment 2	10,300	13,628	16,686	20,286
SR 22	West of GCP, Segment 2	10,300	18,412	22,530	27,192
GCP, Seg. 29	North of SR 22	0	2,400	2,939	3,570
GCP, Seg. 29,33-39	SR 22 - Star Ave	0	2,400	2,939	3,570
GCP, Seg. 38-39	South of US 231	0	2,400	2,939	3,570
US 231	Star Ave to the east	18150	22,162	27,096	33,111
US 231	US 231 (1480' South of CR 388 at Youngstown)	15700	19,362	23,696	28,911

Sources:

Traffic from 2004 FDOT Traffic Data CD & ATKINS traffic counts

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Figure 3-2a: Alignment 8, Option a: AADT for Existing and Future Years

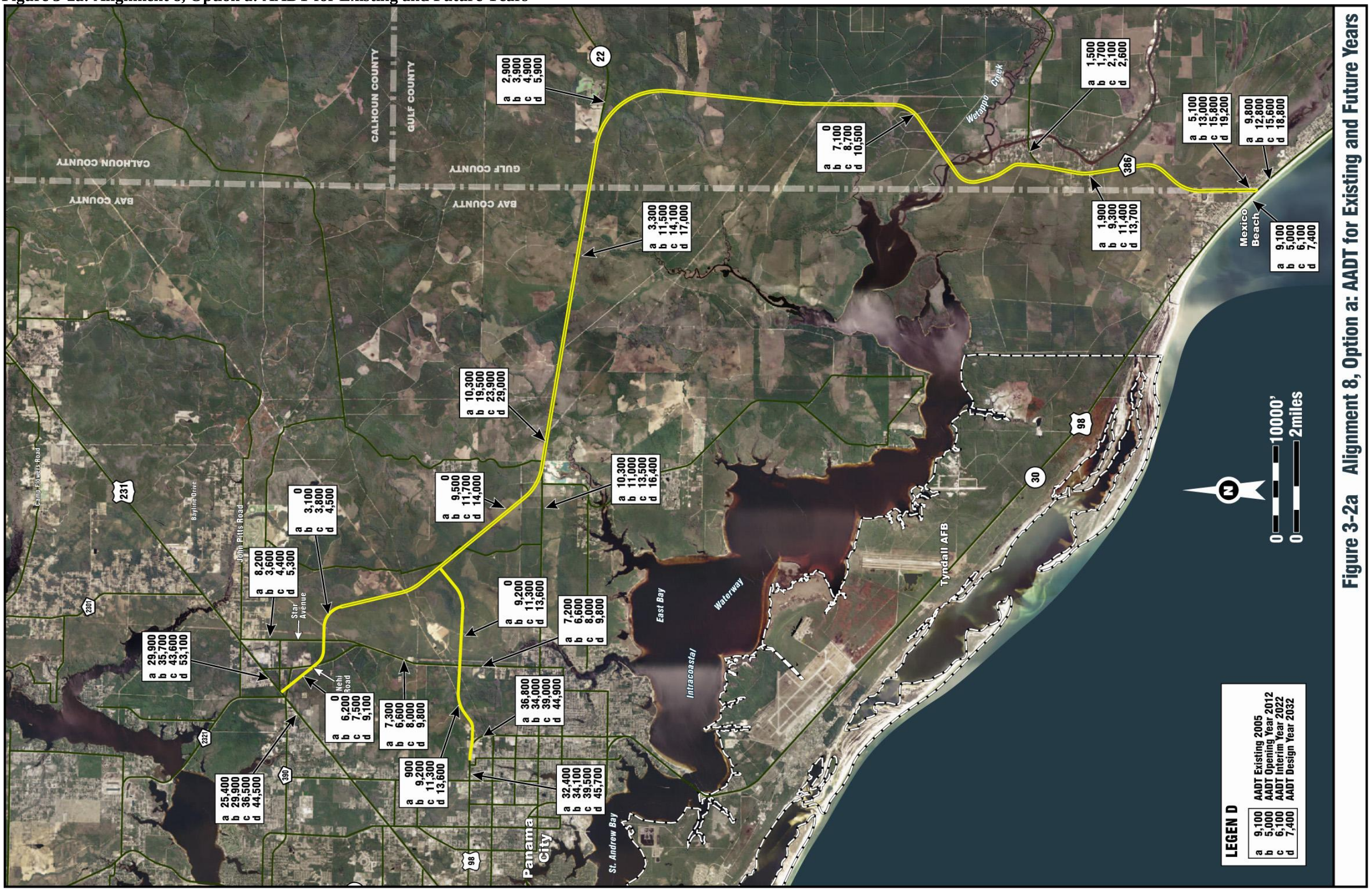


Figure 3-2b: Alignment 8, Option b: AADT for Existing and Future Years

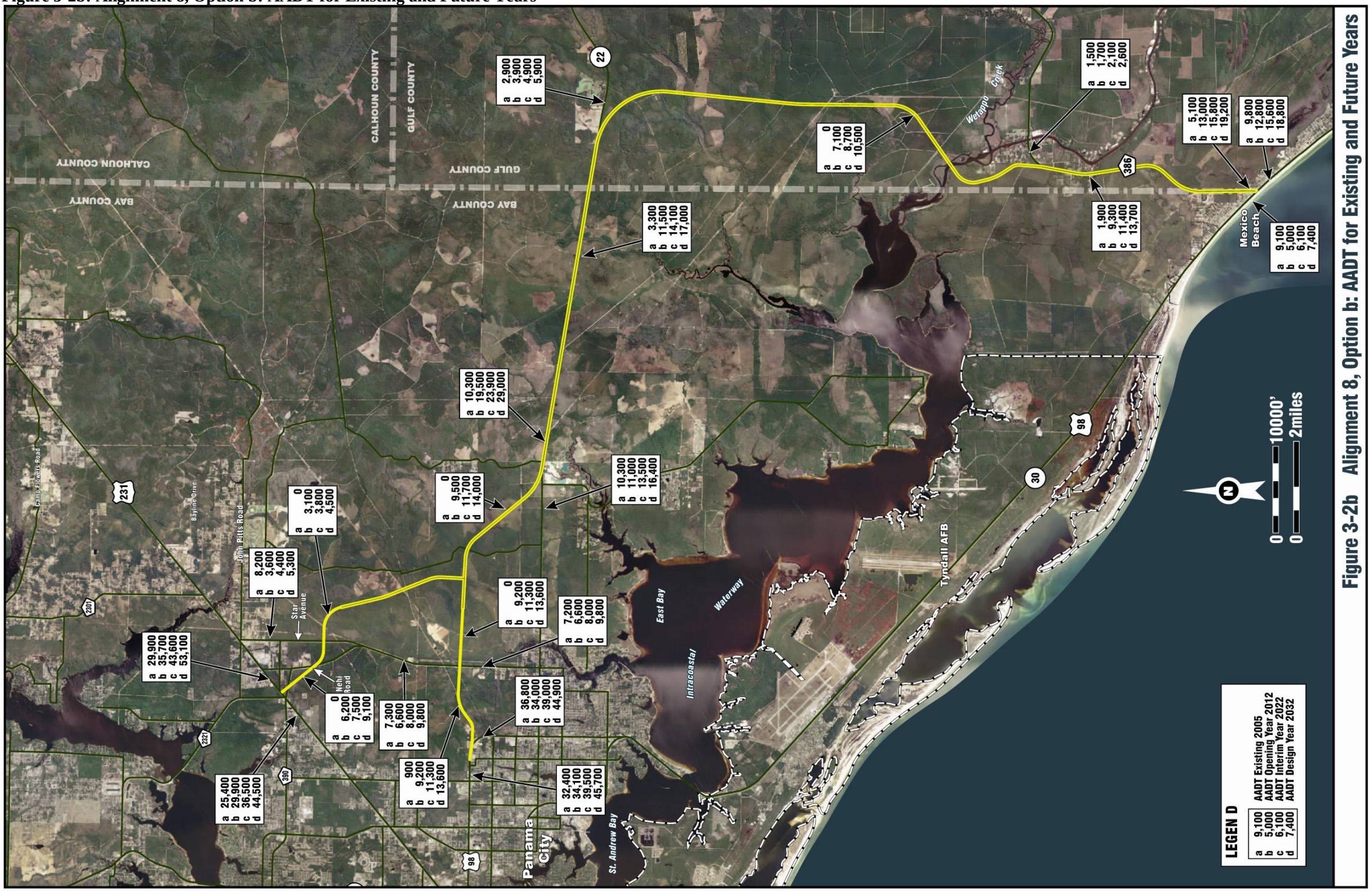


Figure 3-2c: Alignment 8, Option c: AADT for Existing and Future Years

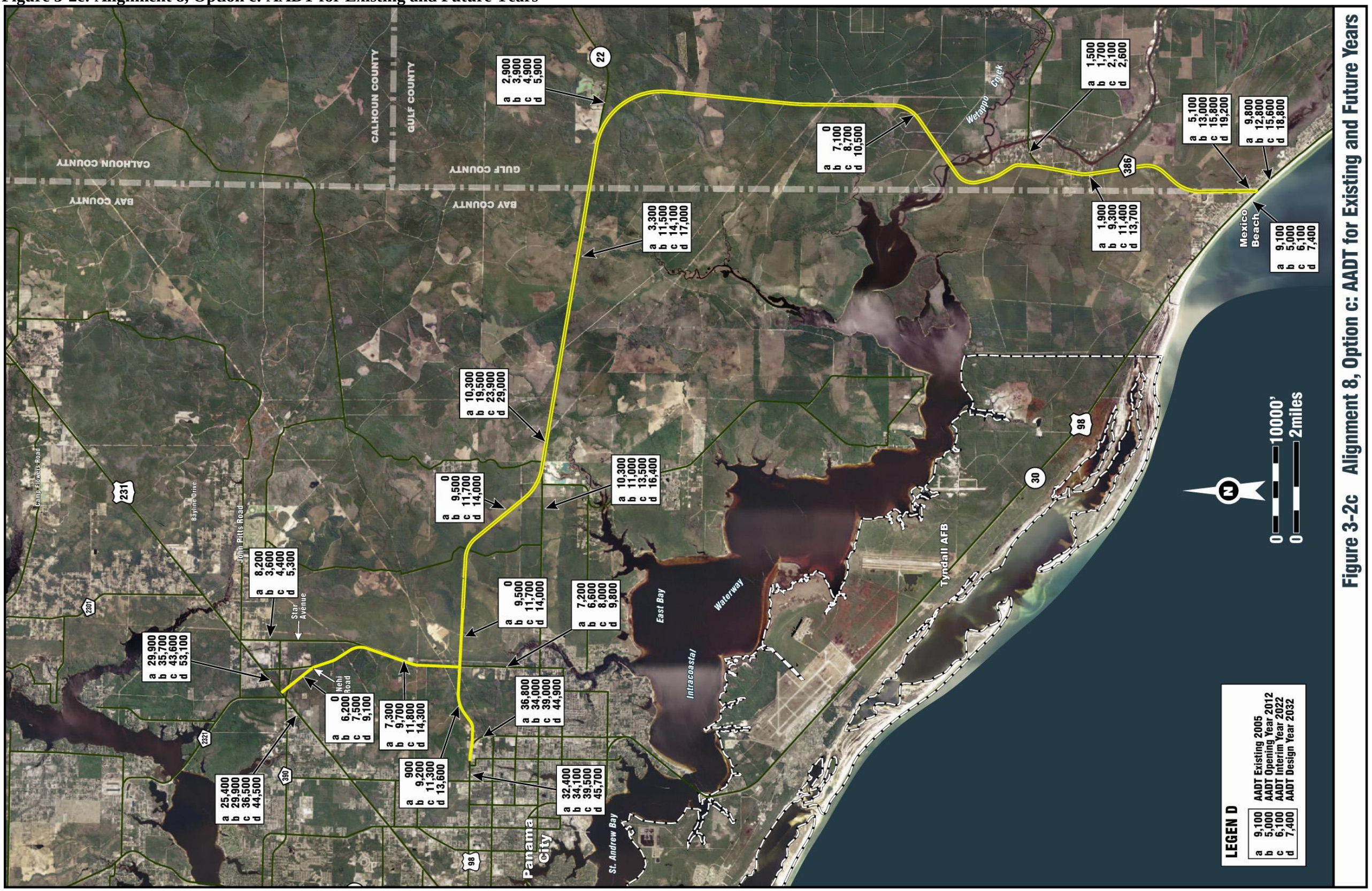


Figure 3-2d: Alignment 8, Option d: AADT for Existing and Future Years

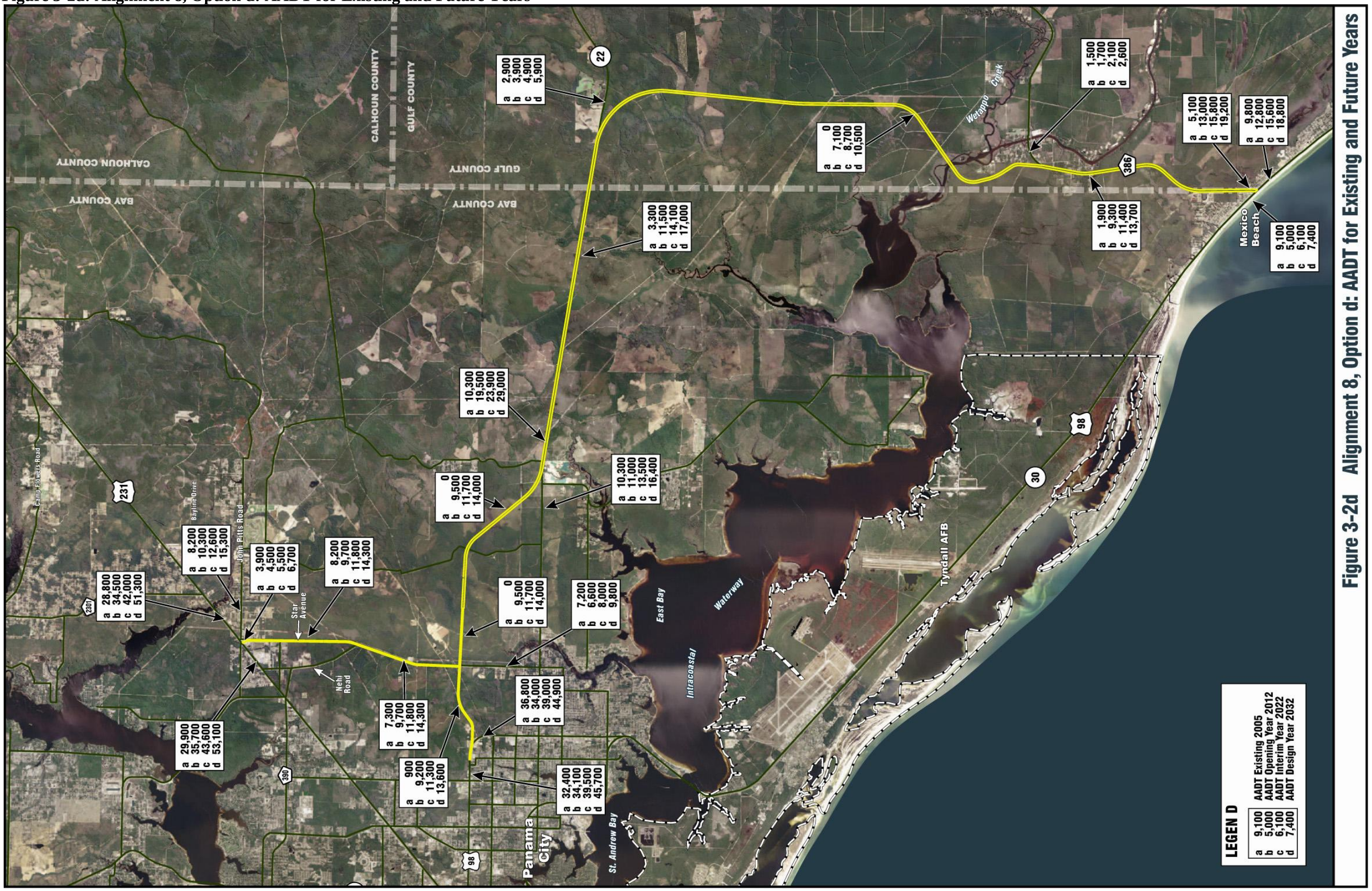


Figure 3-2e: Alignment 14: AADT for Existing and Future Years

Figure 3-2f: Alignment 15: AADT for Existing and Future Years

Figure 3-2g: Alignment 17, Option a: AADT for Existing and Future Years

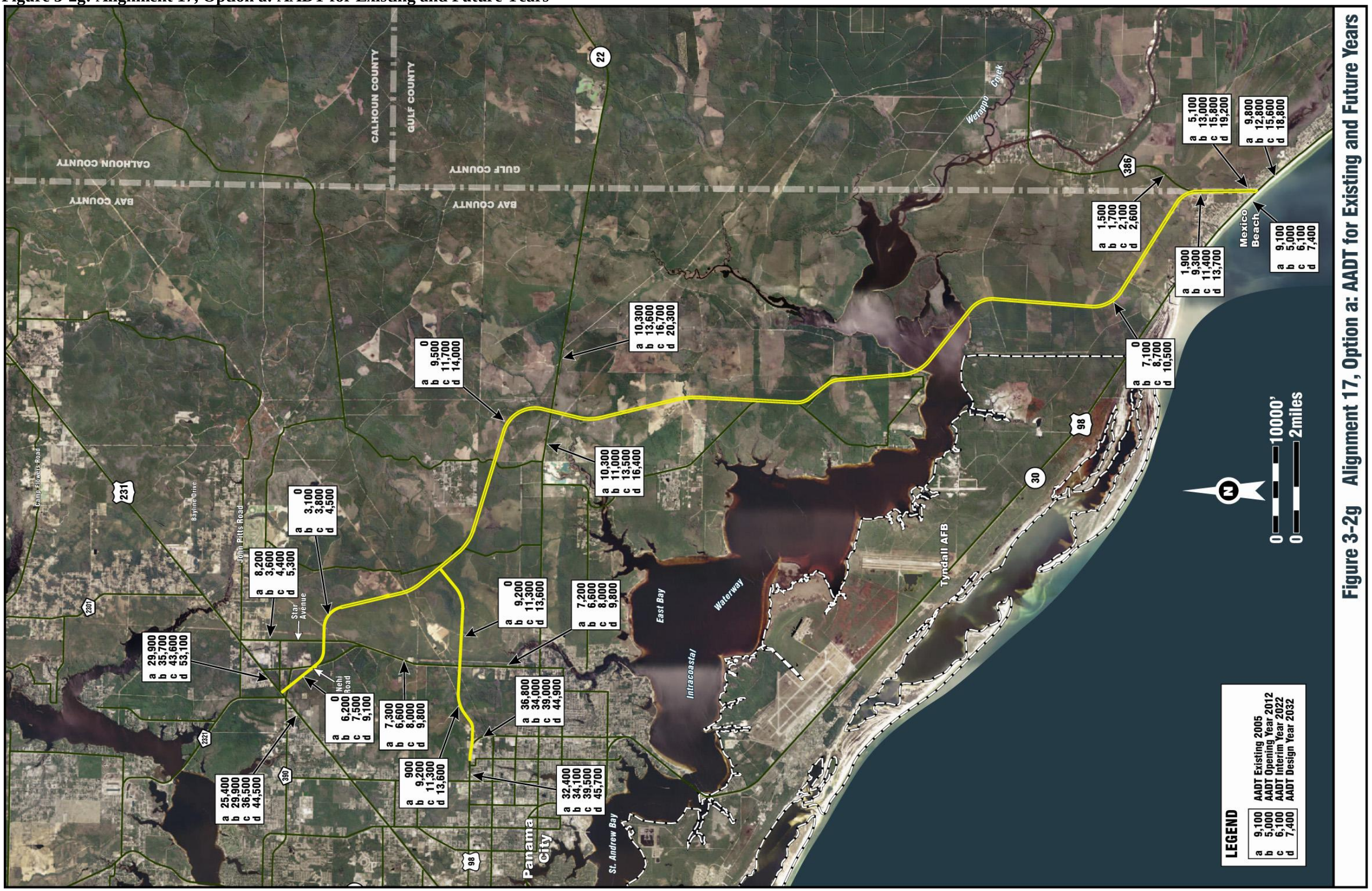


Figure 3-2h: Alignment 17, Option b: AADT for Existing and Future Years

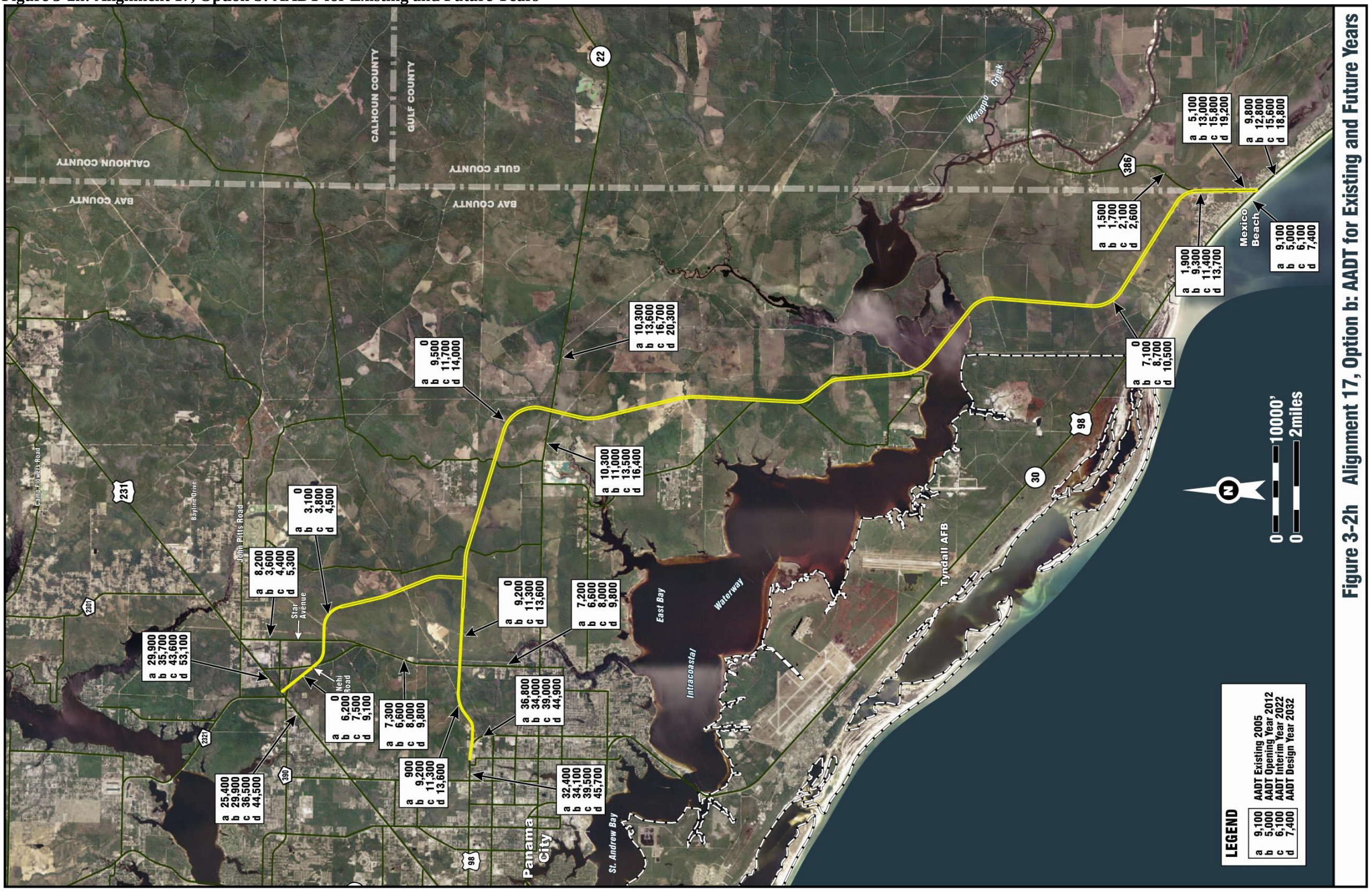


Figure 3-2i: Alignment 17, Option c: AADT for Existing and Future Years

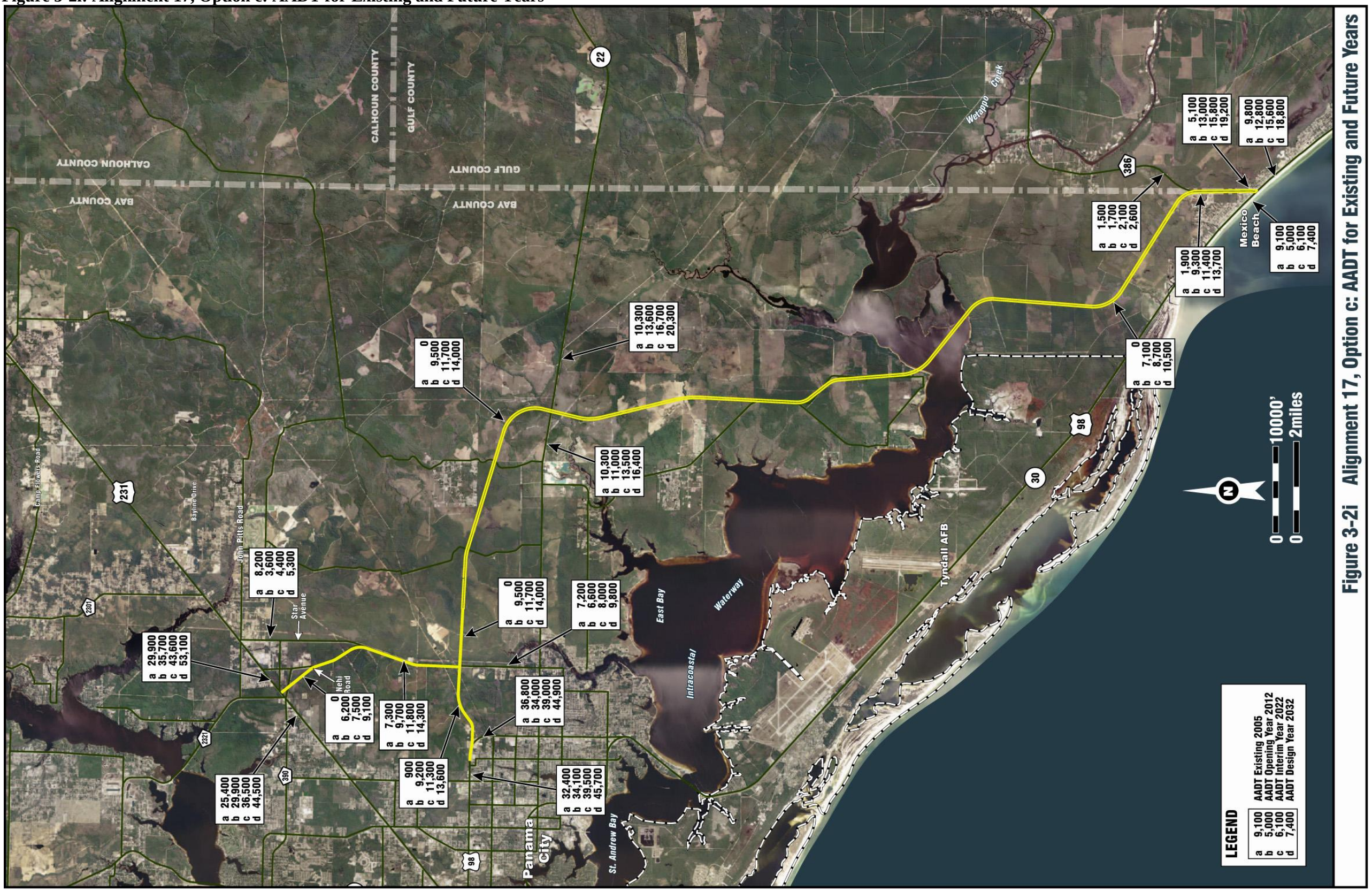


Figure 3-2j: Alignment 17, Option d: AADT for Existing and Future Years

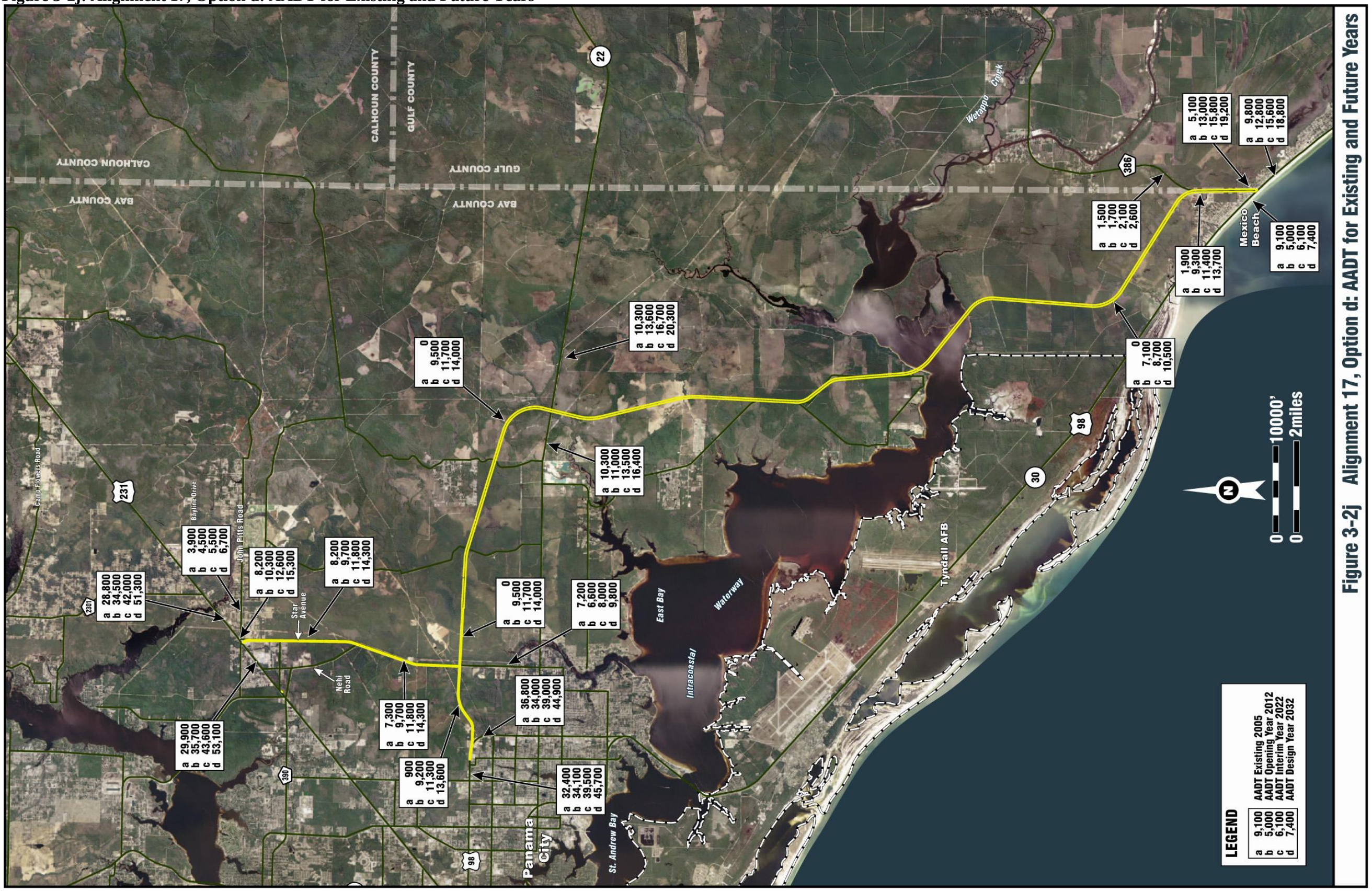
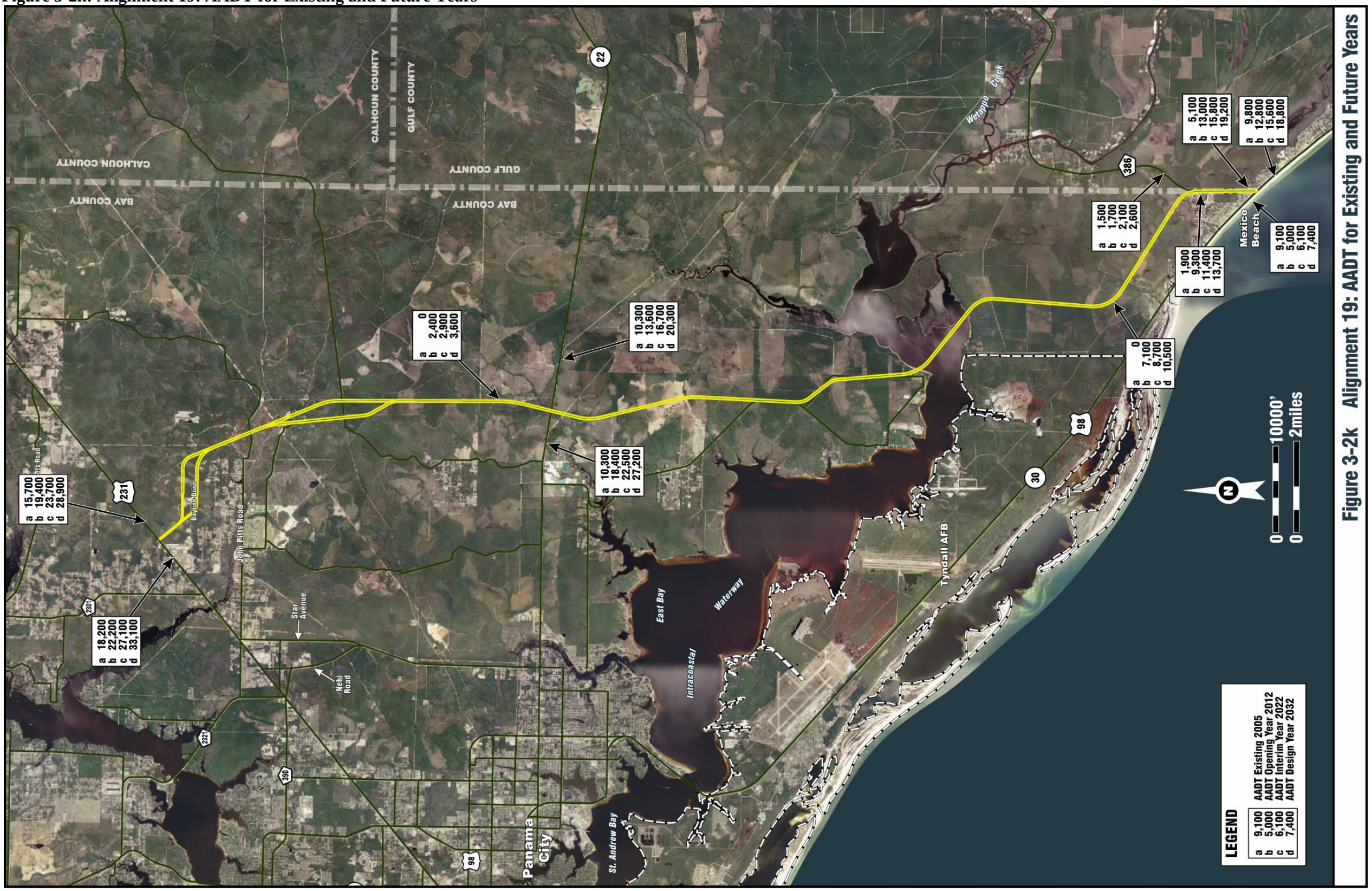


Figure 3-2k: Alignment 19: AADT for Existing and Future Years



3.3 DIRECTIONAL DESIGN HOUR VOLUMES

Capacity and operational analysis for the intersections will require the determination of DDHV. DDHV is the traffic volume expected to use a highway segment during the peak hour of the design year in the peak direction. Existing year (2005), opening (2012) and interim year (2022) directional peak hour volumes were also developed to allow the possible use of this analysis in a phased construction of the GCP, and to establish no-build conditions.

The methodology used for this analysis is consistent with the FDOT's *Project Traffic Forecasting Handbook.* FDOT's TURNS5A *Turning Analysis Tool* is the recommended program for balancing turning movements and therefore was the method chosen to develop DDHV. TURNS5A first balances the 2-Way AADT volumes (presented in Table 3-7) to achieve consistent flow and then calculates the DDHV by applying the K and D factors (presented in Table 2-8) to the 2-Way AADT volumes for each intersection being analyzed.

DDHV were developed for both the AM and PM peak at the major intersections of the new proposed road and intersecting facilities within the study area. TURNS5 outputs were used and are included in Appendix C. Table 3-8 show the list of intersections being considered for operational analysis, for the opening, interim and the design year, respectively. That Table 3-8 also shows a classification by type from 1 to 14, which means that intersections with similar geometric configuration and traffic volumes were grouped together to avoid repetition of individual intersection operational analysis.

Table 3-8: List of Intersections Considered for Operational Analysis

Intersection Type	Alignment 8	Alignment 14	Alignment 15	Alignment 17	Alignment 19
1	US 98 @ CR 386	US 98 @ CR 386	US 98 @ CR 386	US 98 @ CR 386	US 98 @ CR 386
2	CR 386@ GCP, Seg 3	CR 386 @ GCP. Seg 4	CR 386 @ GCP, Seg 4	CR 386 @ GCP, Seg 2	CR 386 @ GCP, Seg 2
3				GCP Seg 2, 16 @ SR 22	
3a					GCP Seg 2, 29 @ SR 22
4	GCP Seg 10 @ SR 22, East	GCP Seg 9 @ SR 22, East			
5	GCP Seg 15 @ SR 22, West				
5a		GCP Seg 30 @ SR 22, West			
5b			GCP Seg 13, 40 @ SR 22		
6	GCP Seg 20, 22 @ GCP Seg 24			GCP Seg 20, 22 @ GCP Seg.24	
6a	GCP Seg 17, 21 @ GCP Seg 23			GCP Seg 17, 21 @ GCP Seg 23	
7	GCP Seg 21,22 25 @ Star Ave			GCP Seg 21,22 25 @ Star Ave	
8	GCP Seg 17, 21, 25 @ Star Ave GCP Seg.26			GCP Seg. 17, 21, 25 @ Star Ave GCP Seg 26	
9	GP Seg 25 @ US 98 Tyndall Parkway			GP Seg 25 @ US 98 Tyndall Parkway	
10	GCP Seg 26, 27 @ Star Ave			GCP Seg 26, 27 @ Star Ave	
10a	GCP Seg 28 & John Pitts Rd			GCP Seg 28 & John Pitts Rd	
10b	GCP Seg 28 & Start Ave			GCP Seg 28 & Start Ave	
11	GCP Seg 23, 24, @ Star Ave			GCP Seg 23, 24, @ Star Ave	
12	GCP Seg 23, 24, 27 @ US 231			GCP Seg 23, 24, 27 @ US 231	
13		GCP Seg 30, 38-39 @ US 231			GCP Seg 30, 38-39 @ US 231
14			GCP Seg 41, 42 @ US 231		

Source: ATKINS

Note: Highlighted intersections are special cases, which were analyzed separately. Details in Appendices D and E.

DDHV for all of these 14 intersection types were calculated for all future analysis years. Most of these intersections are new ones with the exceptions of US 98 @ CR 386 and US 98 @ Tram Road. Therefore, only these two intersections were analyzed for the existing year 2005.

The configuration of Tram Rd-GCP Segment 25 at the intersection of US 98 (intersection type 9), as well as the Nehi Road options of the GCP intersection with US 231 (intersection type 12), were handled as special cases because their conceptual geometric design called for an interim layout (opening and interim year) and a final layout (for the interim and design years).

Figures 3-3a to 3-3c present the DDHV for existing year (if intersection is existing) and all future years, per intersection type, except for the two north terminal points noted above, which are presented in Figures 3-4 to 3-7.

Figure 3-3a: Opening Year 2012 DDHV

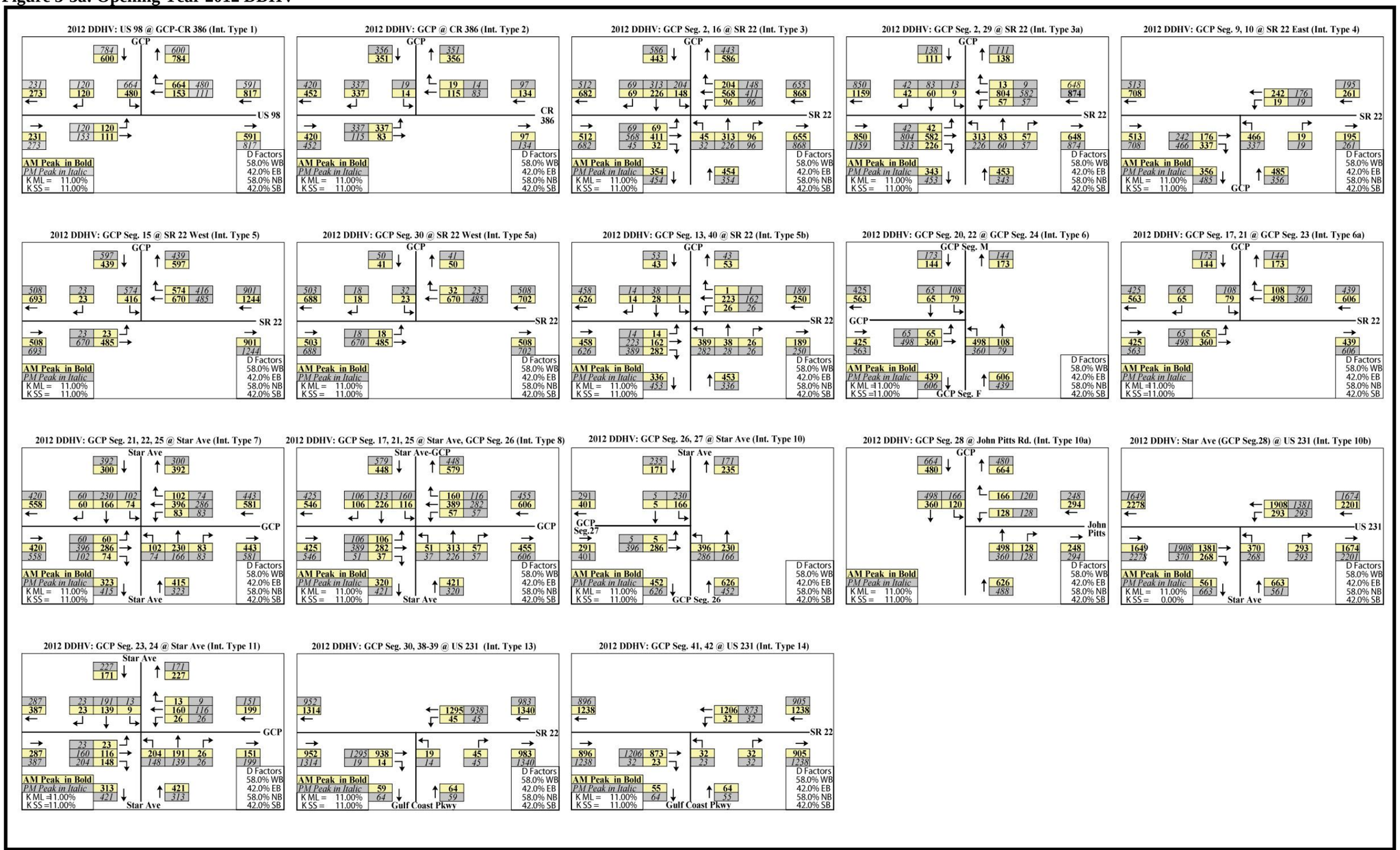


Figure 3-3a Opening Year 2012 DDHV

Figure 3-3b: Interim Year 2022 DDHV

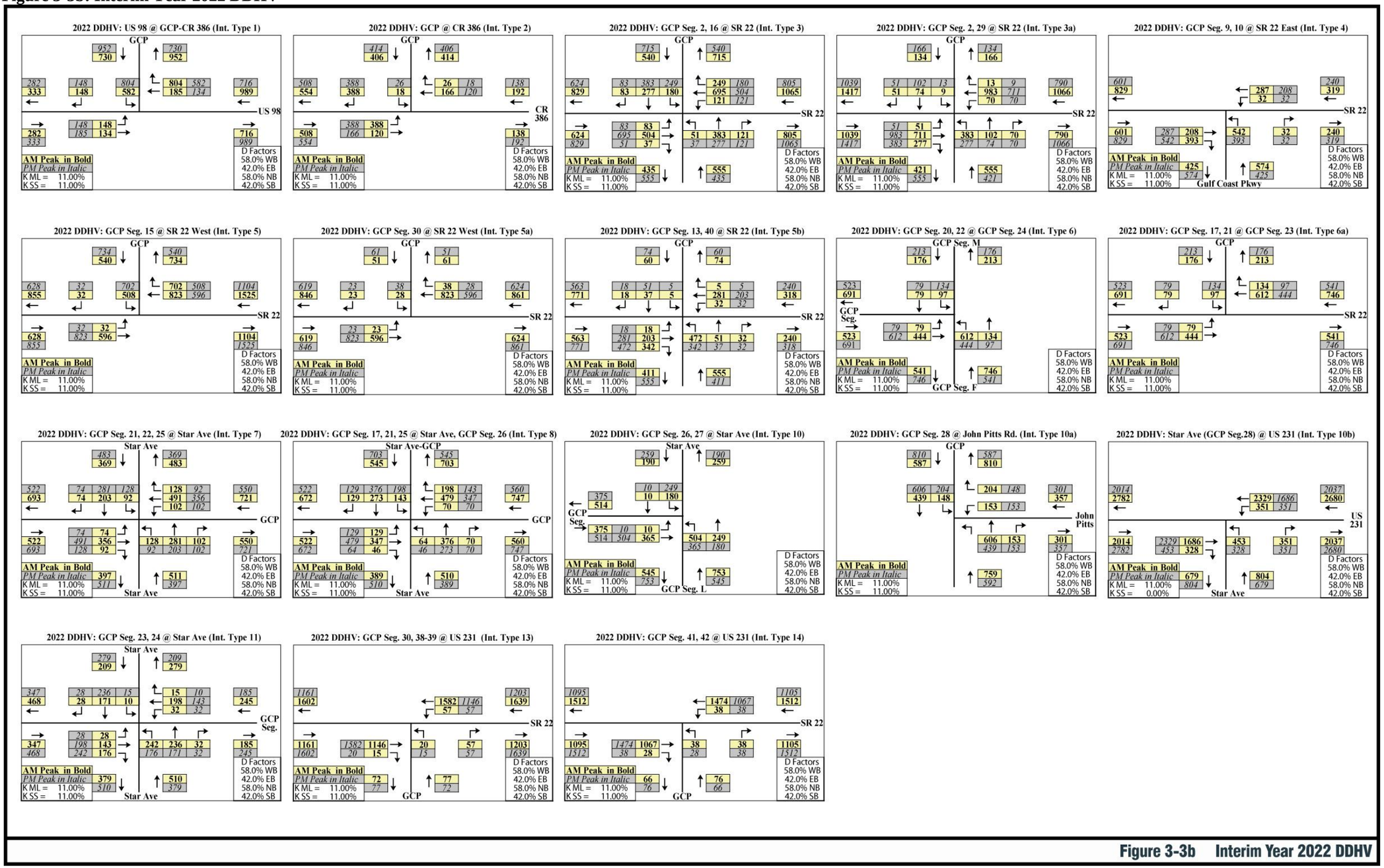


Figure 3-3b Interim Year 2022 DDHV

Figure 3-3c: Design Year 2032 DDHV

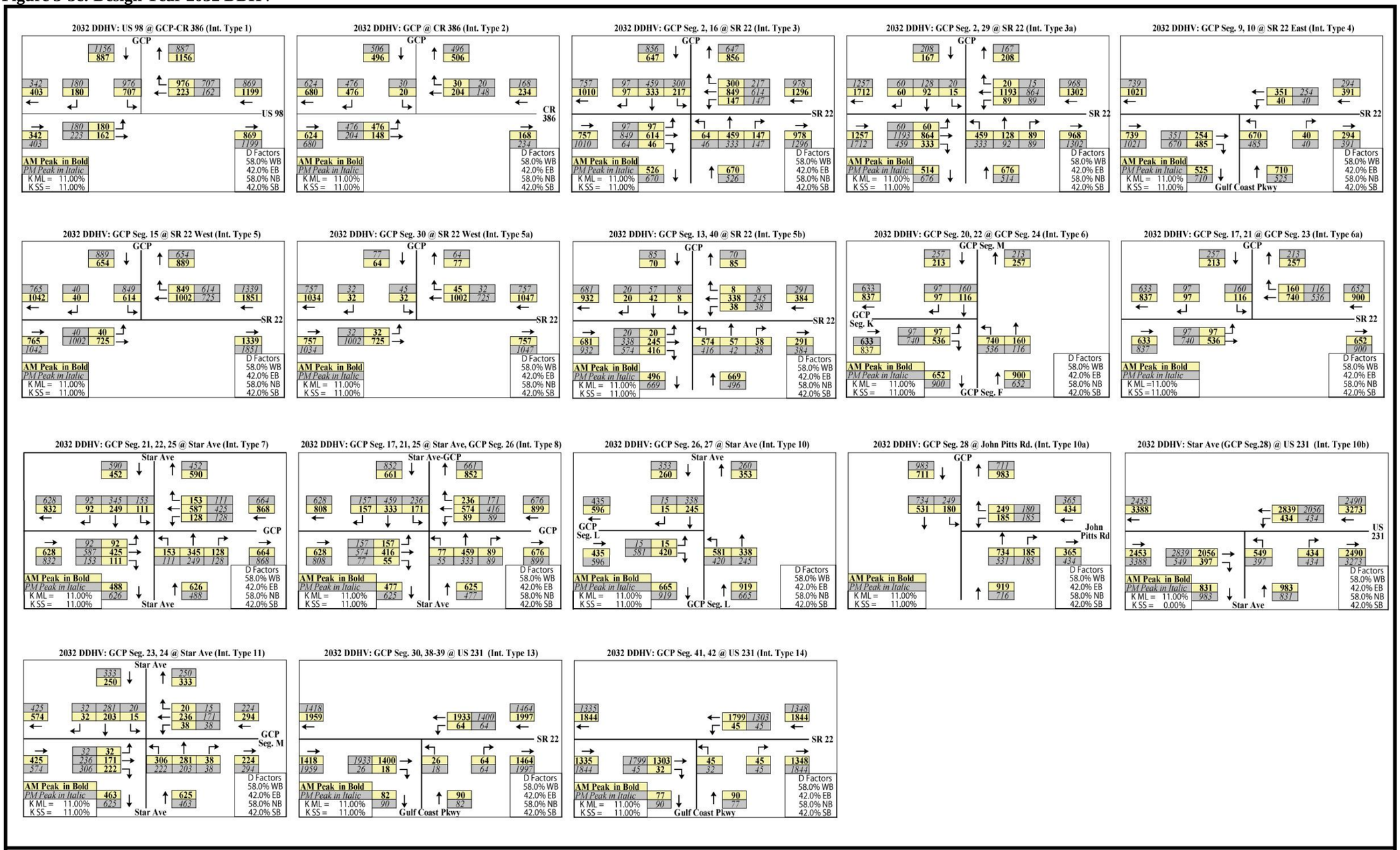


Figure 3-3b Design Year 2032 DDHV

Figure 3-4: US 98 / Tram Road Intersection Initial Configuration DDHV

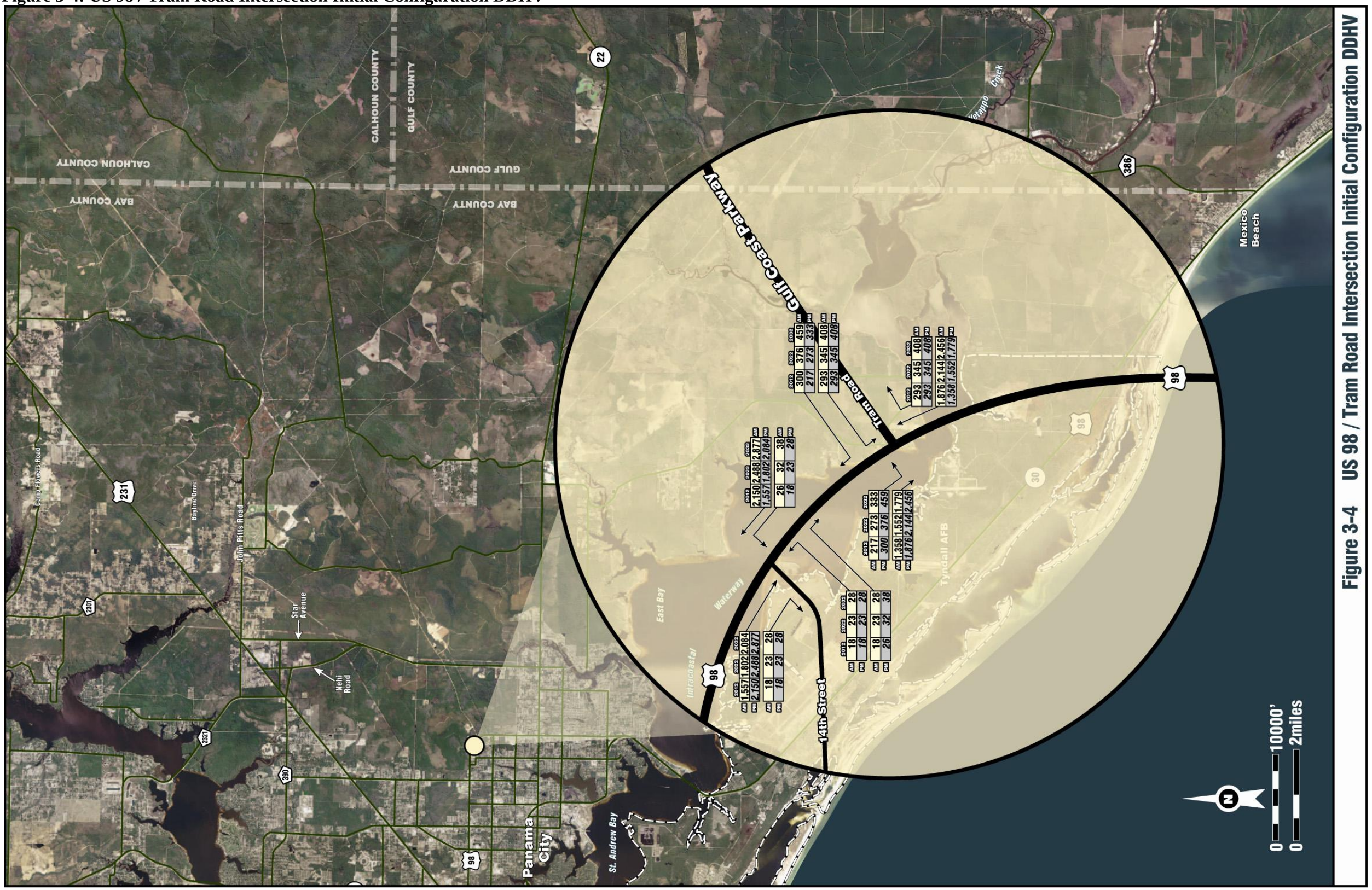


Figure 3-5: US98 / Tram Road Intersection Final Configuration DDHV

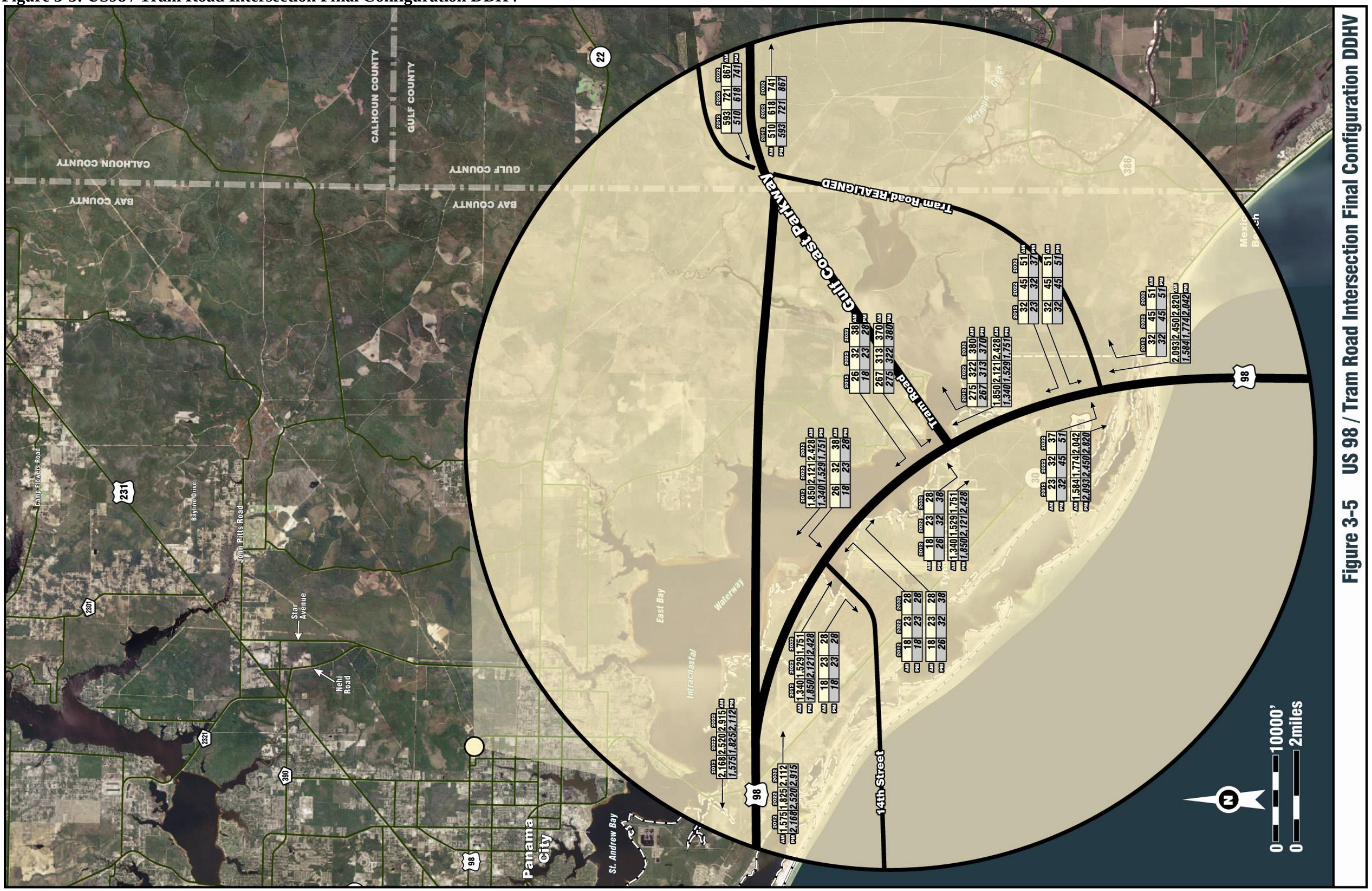


Figure 3-6: US 231 / GCP Intersection Interim Configuration DDHV

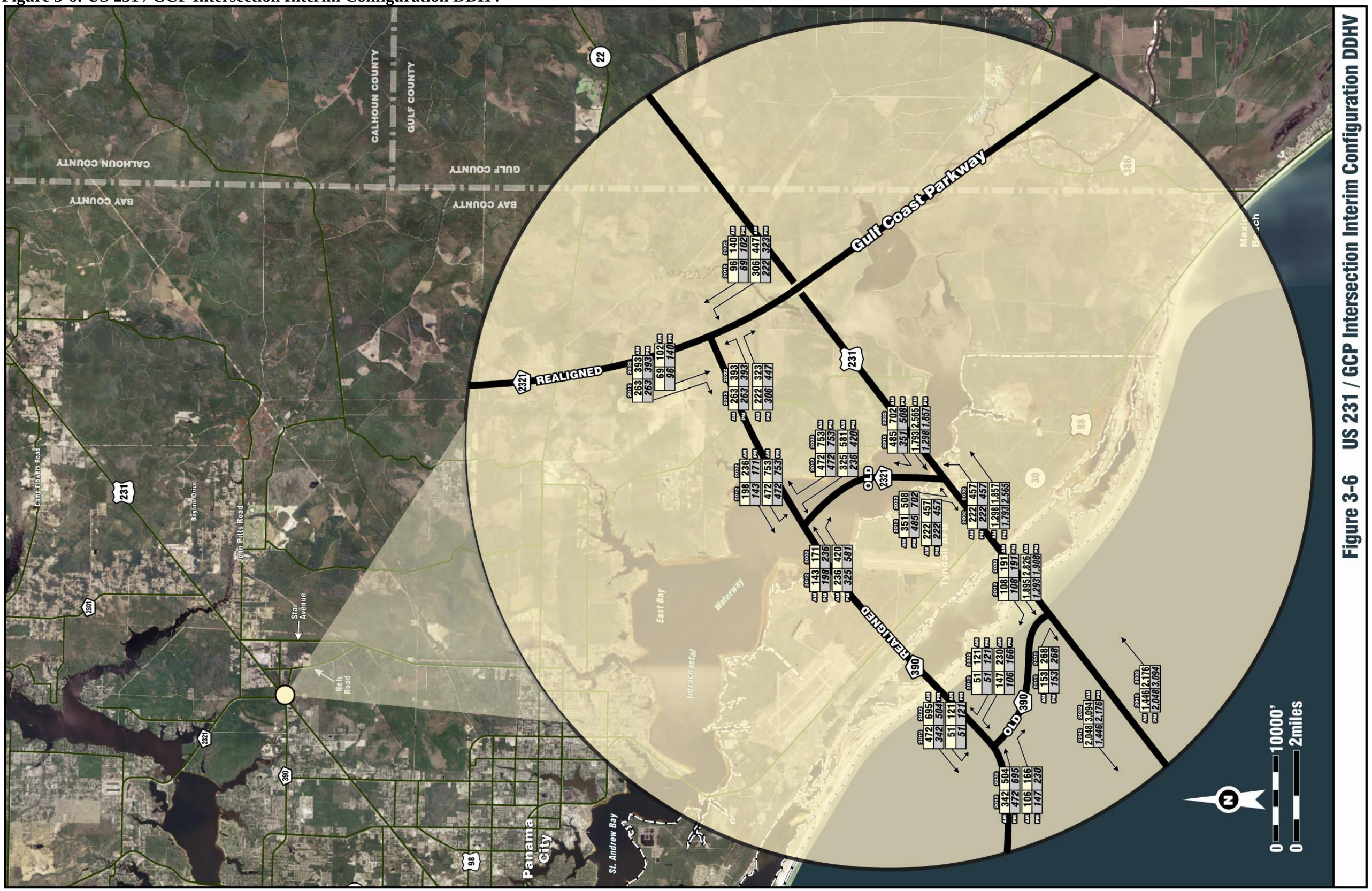
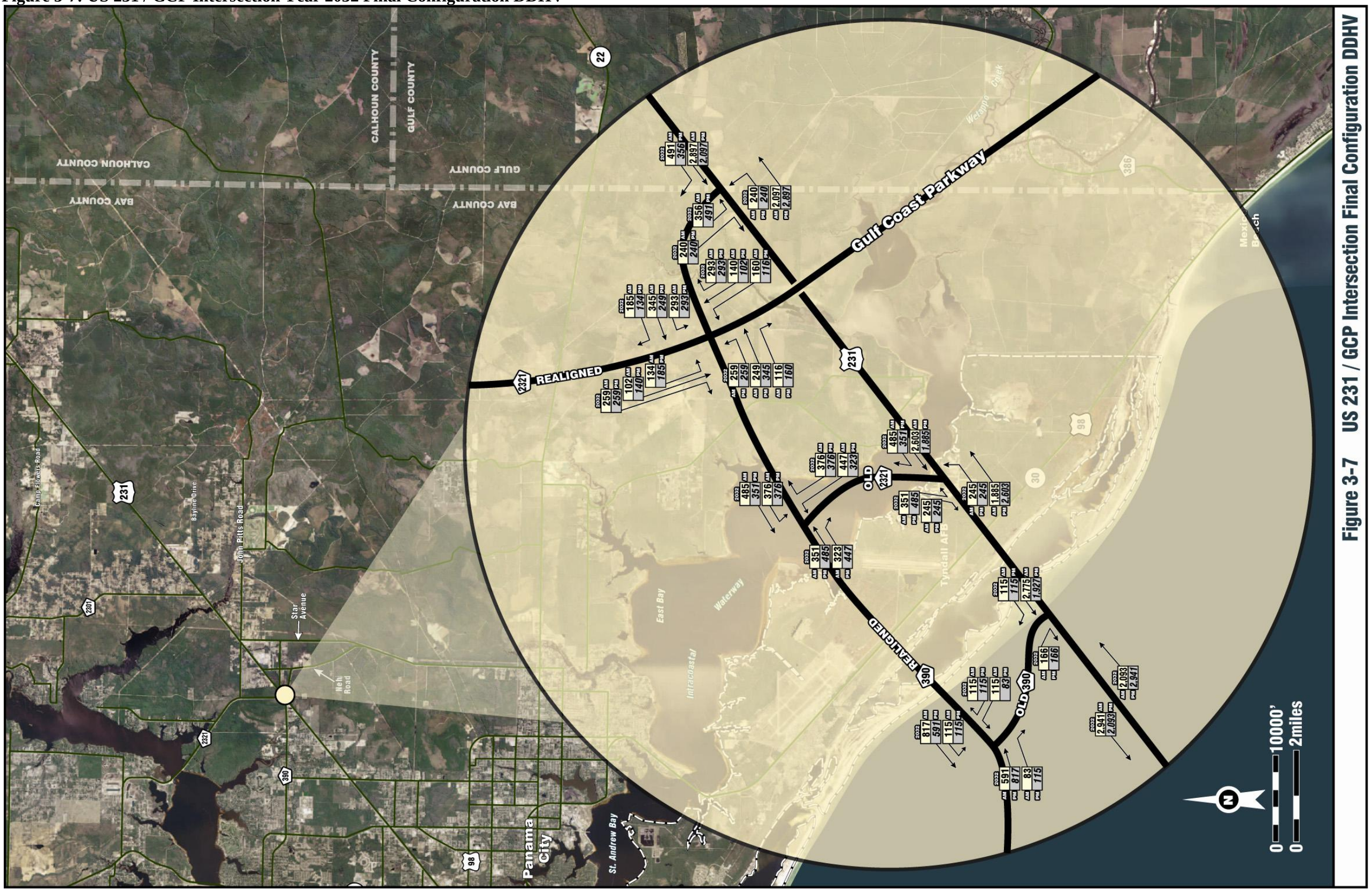


Figure 3-7: US 231 / GCP Intersection Year 2032 Final Configuration DDHV



4.0 LEVEL OF SERVICE (LOS)

4.1 EXISTING YEAR DAILY LOS

Arterials AADT volumes and LOS within the study area are shown in Table 4-1. The Generalized Tables from the FDOT's *2002 Quality / Level of Service Handbook* were used to make the LOS determination.

Table 4-1: Existing Year 2005 LOS

Roadway	Segment	Adopted LOS Standard	LOS Maximun Volume	Functional Classification	Facility Type	Area Type	No. of Lanes	Year 2005 AADT	Year 2005 LOS
CR 386	US 98 - 15th Street	C	14,200	Minor arterial	Undivided	Rural Developed	2	1,700	B
CR 386	15th Street - N. Long Street	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	1,900	B
CR 386	N. Long Street - SR 71	C	8100	Minor arterial	Undivided	Rural Undeveloped	2	1,500	B
SR 71	CR 386 - SR 22	C	14200	Minor arterial	Undivided	Rural Developed	2	5,800	C
SR 22	West of SR 71 - Bay Co. line (Gulf Co.)	C	8100	Minor arterial	Undivided	Rural Undeveloped	2	2,900	B
SR 22	Bay Co. Line - Sandy Creek Rd	C	14100	Minor Arterial	Undivided	Transitioning into Urban	2	3,300	B
SR 22	Sandy Creek Rd - CR 2297 (Allanton Rd.)	D	16500	Minor Arterial	Undivided	Urban	2	4,200	B
SR 22	CR 2297 - Star Ave	D	16500	Minor Arterial	Undivided	Urban	2	10,300	C
SR 22	Star Ave - US 98	D	16500	Minor Arterial	Undivided	Urban	2	20,900	**F**
SR 22	West of US 98	D	16500	Minor Arterial	Undivided	Urban	2	11,100	C
US 98	Gulf Co., East of CR 386	C	14200	Principal Arterial	Undivided	Rural Developed	2	9,800	C
US 98	CR 386 - Tyndall AFB	C	14200	Principal Arterial	Undivided	Rural Developed	2	9,100	C
US 98	Tyndall AFB - SR 22	D	35500	Principal Arterial	Divided	Urban	4	35,500	D
US 98	SR 22 - Tram Rd	D	35500	Principal Arterial	Divided	Urban	4	36,800	**F**
US 98	Tram Rd - Transmitter Rd	D	35500	Principal Arterial	Divided	Urban	4	32,400	C
US 231	Transmitter Rd - CR 390	C	35500	Principal Arterial	Divided	Urban	4	25,400	B
US 231	CR 390 - Star Ave	C	35500	Principal Arterial	Divided	Urban	4	29,900	C
US 231	Star Ave to the east	C	35500	Principal Arterial	Divided	Urban	4	28,800	B
Star Ave	SR 22 - Tram Rd	D	14850	Major Collector	Undivided	Urban	2	7,800	B
Star Ave	Tram Rd - US 231	D	14850	Urban Collector	Undivided	Urban	2	8,200	B
Tram Road	US 98 - Star Ave	D	14850	Minor Collector	Undivided	Urban	2	900	B
Transmitter Rd	US 98 - US 231	D	14850	Minor Arterial	Undivided	Urban	2	11,300	C
CR 390	North - North West of US 231	D	14850	Urban Collector	Undivided	Urban	2	7,300	B
CR 2321	North - Northwest of US 231	D	14850	Minor Arterial	Undivided	Urban	2	4,500	B
John Pitts Rd.	CR 2293 (John Pitts Rd., 300' east of Star Av.)	D	14850	Minor Arterial	Undivided	Urban	2	3,900	B

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts

LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from

www.wfrpc.org/baydocuments accessed in September 2009

Note: Letters in BOLD reflects a LOS below recommended value

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

4.2 FUTURE YEARS DAILY LOS

The design year LOS is presented, for all five alternative alignments in Table 4-2a through 4-2d. They are based in the FDOT's Generalized Tables mentioned before and assuming the final typical section for the project, which is a 4-lane divided facility. Based on intersection operational analysis that follows in the next Section 4.3, the capacity of selected facilities intersecting the project, as noted in the corresponding tables, were improved to avoid failure.

Table 4-2a: Design Year Segment LOS: Alternative 8a

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 1									
US 98	East of CR 386	9,800	C	14200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386 (GCP Segment 1)	US 98 - 15th Street	1,700	B	23800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386 (GCP Segment 1)	15th Street - GCP Segment 3	1,900	B	26300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 3 - SR 71	1,500	C	8100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
	Segments 3,8,10,14,15									
GCP, Seg. 3,8,10	CR 386 - SR 22	0	B	26300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 10	2,900	C	8100	Minor arterial	Undivided	Rural Undeveloped	2	5,851	C
SR 22 - Segment 14	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	B	26300	Principal Arterial	Divided	Rural Undeveloped	4	18,586	B
SR 22	East of GCP, Segment 15	10,300	B	26300	Principal Arterial	Divided	Rural Undeveloped	4	28,986	C
SR 22	West of GCP, Segment 15	10,300	C	15100	Minor arterial	Undivided	Transitioning into Urban	2	16,359	D
GCP, Seg. 15,20	SR 22 - GCP, Segment 22	0	B	31400	Principal Arterial	Divided	Transitioning into Urban	4	13,986	B
	Segment 22,25									
GCP, Seg. 20	South of GCP, Seg. 22	0	B	31400	Principal Arterial	Divided	Transitioning into Urban	4	13,986	B
GCP, Seg 24	North of GCP, Seg. 22	0	D	36700	Principal Arterial	Divided	Urban	4	4,507	B
GCP, Seg. 22	East of Star Ave	0	D	36700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	14850	Urban Collector	Undivided	Urban	2	9,836	C
	Segment 25									
Tram Road	US 98 - Star Ave	900	D	36700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14850	Minor collector	Undivided	Urban	2	1,200	B
	Segment 24									
Star Ave, S. of Seg. 24	Tram Rd - GCP, Seg 24	7,300	D	14850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg 24	East of Star Ave	0	D	36700	Principal Arterial	Divided	Urban	4	4,507	B
Star Ave	North of GCP, Segment 24	8,200	D	14850	Urban Collector	Undivided	Urban	2	5,336	B
GCP, Seg 24	West of Star Ave	0	D	36700	Principal Arterial	Divided	Urban	4	9,143	B
US 231	West, South west of GCP, Seg. 24	25,400	D	55300	Principal Arterial	Divided	Urban	6	44,485	B
US 231	East, Northeast of GCP, Seg. 24	29,900	D	55300	Principal Arterial	Divided	Urban	6	53,111	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from

www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2b: Design Year Segment LOS: Alternative 8b

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 1									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 3	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 3 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
	Segments 3,8,10,14,15									
GCP, Seg. 3,8,10	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 10	2,900	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	5,851	C
SR 22 - Segment 14	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	18,586	B
SR 22 - Segment 15	East of GCP, Segment 15	10,300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	28,986	C
SR 22	West of GCP, Segment 15	10,300	C	15,100	Minor arterial	Undivided	Transitioning into Urban	2	16,359	D
GCP, Seg. 15,17	SR 22 - GCP, Segment 21	0	B	31,400	Principal Arterial	Divided	Transitioning into Urban	4	13,986	B
	Segment 21,25									
GCP, Seg. 17	East of GCP, Seg. 23	0	B	31,400	Principal Arterial	Divided	Transitioning into Urban	4	13,986	B
GCP, Seg 23	North of GCP, Seg. 17,21	0	D	36,700	Principal Arterial	Divided	Urban	4	4,507	B
GCP, Seg. 21	East of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
	Segment 25									
Tram Road	US 98 - Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segment 23									
Star Ave, S. of Seg. 23	Tram Rd - GCP, Seg 23	7,300	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg 23	East of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	4,507	B
Star Ave	North of GCP, Segment 23	8,200	D	14,850	Urban Collector	Undivided	Urban	2	5,336	B
GCP, Seg 23	West of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	9,143	B
US 231	West, South west of GCP, Seg. 23	25,400	D	55,300	Principal Arterial	Divided	Urban	6	44,485	B
US 231	East, Northeast of GCP, Seg. 23	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2c: Design Year Segment LOS: Alternative 8c

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 1									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 3	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 3 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
	Segments 3, 8, 10, 14, 15									
GCP, Seg 3,8,10	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 10	2,900	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	5,851	C
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	18,586	B
SR 22	East of GCP, Segment 15	10,300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	28,986	C
SR 22	West of GCP, Segment 15	10,300	C	15,100	Minor arterial	Undivided	Transitioning into Urban	2	16,359	D
GCP, Seg. 15,17,21	North of SR 22	0	B	31,400	Principal Arterial	Divided	Transitioning into Urban	4	13,986	B
	Segments 17,21									
GCP, Seg. 17,21	SR 22 - Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
	Segment 25									
Tram Road	US 98 - Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segments 26,27									
GCP, Seg. 26	Tram Rd - Nehi Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
Star Ave	North of GCP, Segment 26,27	8,200	D	14,850	Urban Collector	Undivided	Urban	2	5,336	B
GCP, Seg 27	Star Ave - US 231	0	D	36,700	Principal Arterial	Divided	Urban	4	9,143	B
US 231	West, South west of GCP, Seg. 27	25,400	D	55,300	Principal Arterial	Divided	Urban	6	44,485	B
US 231	East, Northeast of GCP, Seg. 27	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2d: Design Year Segment LOS: Alternative 8d

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 1									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 3	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 3 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
	Segments 3, 8, 10, 14, 15									
GCP, Seg 3,8,10	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 10	2,900	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	5,851	C
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,200	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	18,586	B
SR 22	East of GCP, Segment 15	10,300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	28,986	C
SR 22	West of GCP, Segment 15	10,300	C	15,100	Minor arterial	Undivided	Transitioning into Urban	2	16,359	D
GCP, Seg. 15,17,21	North of SR 22	0	B	31,400	Principal Arterial	Divided	Transitioning into Urban	4	13,986	B
	Segments 17,21									
GCP, Seg. 17,21	SR 22 - Tram Road	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
	Segment 25									
Tram Road	US 98 - Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segments 26,28									
GCP, Seg. 26	Tram Rd - Nehi Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
Star Ave (GCP Seg. 28)	Segment 28 North of GCP, Seg. 26	8,200	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
John Pitts Road	East of Star Ave (GCP, Seg. 28)	3900	D	14,850	Urban Collector	Undivided	Urban	2	6,700	B
GCP, Seg 28	North of John Pitts Road	8,200	D	36,700	Principal Arterial	Divided	Urban	4	15,343	B
US 231	West, South west of GCP, Seg. 28	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C
US 231	East, Northeast of GCP, Seg. 28	28,800	D	55,300	Principal Arterial	Divided	Urban	6	51,311	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from

www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2e: Design Year Segment LOS: Alternative 14

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segments 1, 4									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 4	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 4 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
	Segment 4, 5, 9, 11									
GCP, Seg 4, 5, 9	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 9	2,900	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	5,851	C
SR 22 - Segment 11	West of GCP, Segment 9	3,300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	16,386	B
SR 22	West of GCP, Segment 11	4,200	C	15,100	Minor arterial	Undivided	Transitioning into Urban	2	16,331	D
GCP, Seg. 30	North of SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1,404	B
	Segment 30									
GCP, Seg. 30	SR 22 - US 231	7,300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1,404	B
US 231	Star Ave to the east	18,150	C	45,400	Principal Arterial	Divided	Transitioning into Urban	4	33,111	C
US 231	US 231 (1480' South of CR 388 at Youngstown)	15,700	C	45,400	Principal Arterial	Divided	Transitioning into Urban	4	28,911	B

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2f: Design Year Segment LOS: Alternative 15

Roadway	Segment	Year 2005 AADT	Adopted LOS Standard	LOS Maximun Volume	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segments 1, 4									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 4	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 4 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
	Segment 4, 5, 9									
GCP, Seg 4, 5, 9	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 9	2,900	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	5,851	C
SR 22	West of GCP, Segment 9	3,300	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	14,731	E
GCP, Seg. 13, 40	North of SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1,404	B
	Segment 13, 40, 41, 42									
GCP, Seg. 13, 40, 41, 42	SR 22 - US 231	7,300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1,404	B
US 231	North of Campflower Road	15,700	C	45,400	Principal Arterial	Divided	Transitioning into Urban	4	28,911	B
US 231	US 231 (1480' South of CR 388 at Youngstown)	15,700	C	45,400	Principal Arterial	Divided	Transitioning into Urban	4	28,911	B

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2g: Design Year Segment LOS: Alternative 17a

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 2									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 2	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 2 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
	Segment 16, 19									
GCP, Seg. 2	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	20,286	D
SR 22	West of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	16,359	D
GCP, Seg. 16, 19	SR 22 - Segment 22	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
	Segment 22									
GCP, Seg. 19	South of Seg. 22	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
GCP, Seg 24	North of Seg. 22	0	D	36,700	Principal Arterial	Divided	Urban	4	4,507	B
GCP, Seg. 22	East of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
	Segment 25									
Tram Road	East of US 98	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segment 24									
Star Ave, S. of Seg. 24	Tram Rd - Seg 24	7,300	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg 24	East of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	4,507	B
Star Ave	North of GCP, Segment 24	8,200	D	14,850	Urban Collector	Undivided	Urban	2	5,336	B
GCP, Seg 24	West of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	9,143	B
US 231	West, South west of GCP, Seg. 24	25,400	D	55,300	Principal Arterial	Divided	Urban	6	44,485	B
US 231	East, Northeast of GCP, Seg. 24	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2h: Design Year Segment LOS: Alternative 17b

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 2									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 2	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 2 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
	Segment 16, 18									
GCP, Seg. 2	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	20,286	D
SR 22	West of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	16,359	D
GCP, Seg. 16, 18	SR 22 - Segment 23	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
	Segment 21									
GCP, Seg. 18	East of Seg. 23	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
GCP, Seg 23	North of Seg. 21	0	D	36,700	Principal Arterial	Divided	Urban	4	4,507	B
GCP, Seg. 21	East of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
	Segment 25									
Tram Road	East of US 98	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segment 23									
Star Ave, S. of Seg. 23	Tram Rd - Seg 23	7,300	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg 23	East of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	4,507	B
Star Ave	North of GCP, Segment 23	8,200	D	14,850	Urban Collector	Undivided	Urban	2	5,336	B
GCP, Seg 23	West of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	9,143	B
US 231	West, South west of GCP, Seg. 23	25,400	D	55,300	Principal Arterial	Divided	Urban	6	44,485	B
US 231	East, Northeast of GCP, Seg. 23	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from

www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2i: Design Year Segment LOS: Alternative 17c

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 2									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 2	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 2 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
	Segment 16, 18, 21									
GCP, Seg. 2	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	20,286	D
SR 22	West of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	16,359	D
GCP, Seg. 16, 18, 21	SR 22 - Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave (GCP Segment 26)	North of Tram Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
	Segment 25									
Tram Road	US 98 - Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segment 26, 27									
Star Ave, S. of Seg. 27	Tram Rd - Seg 27	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
Star Ave	North of GCP, Segment 27	8,200	D	14,850	Urban Collector	Undivided	Urban	2	5,336	B
GCP, Seg 27	West of Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	9,143	B
US 231	West, South west of GCP, Seg. 27	25,400	D	55,300	Principal Arterial	Divided	Urban	6	44,485	B
US 231	East, Northeast of GCP, Seg. 27	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2j: Design Year Segment LOS: Alternative 17d

Roadway	Segment	Year 2005 AADT	Adopted LOS	LOS Maximun	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 2									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 2	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 2 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
	Segment 16, 18, 21									
GCP, Seg. 2	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	20,286	D
SR 22	West of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	16,359	D
GCP, Seg. 16, 18, 21	SR 22 - Star Ave	0	D	36,700	Principal Arterial	Divided	Urban	4	13,986	B
Star Ave	South of GCP (South of Tram Rd.)	7,200	D	14,850	Urban Collector	Undivided	Urban	2	9,836	C
GCP, Seg. 25 (Tram Rd)	West of Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
Star Ave	North of Tram Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
	Segment 25									
Tram Road	US 98 - Star Ave	900	D	36,700	Principal Arterial	Divided	Urban	4	13,643	B
US 98	South of Tram Rd	36,800	D	55,300	Principal Arterial	Divided	Urban	6	44,900	B
US 98	North of Tram Rd.	32,400	D	55,300	Principal Arterial	Divided	Urban	6	45,700	C
14th Street	West of Tyndall Prkwy (US 98)	700	D	14,850	Minor collector	Undivided	Urban	2	1,200	B
	Segment 26, 28									
GCP, Seg. 26	Tram Rd - Nehi Rd.	7,300	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
Star Ave (GCP Seg. 28)	Segment 28 North of GCP, Seg. 26	8,200	D	36,700	Principal Arterial	Divided	Urban	4	14,343	B
John Pitts Road	East of Star Ave (GCP, Seg. 28)	3,900	D	14,850	Urban Collector	Undivided	Urban	2	6,700	B
GCP, Seg 28	North of John Pitts Road	8,200	D	36,700	Principal Arterial	Divided	Urban	4	15,343	B
US 231	West, South west of GCP, Seg. 28	29,900	D	55,300	Principal Arterial	Divided	Urban	6	53,111	C
US 231	East, Northeast of GCP, Seg. 28	28,800	D	55,300	Principal Arterial	Divided	Urban	6	51,311	C

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from

www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

Table 4-2k: Design Year Segment LOS: Alternative 19

Roadway	Segment	Year 2005 AADT	Adopted LOS Standard	LOS Maximun Volume	Functional Classification	Facility Type	Area Type	No. of Lanes	AADT	LOS
						Design Year 2032			Design Year 2032	Design Year 2032
	Segment 2									
US 98	East of CR 386	9,800	C	14,200	Principal Arterial	Undivided	Rural Developed	2	18,765	D
US 98	West of CR 386	9,100	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7,400	B
CR 386	US 98 - 15th Street	1,700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13,435	B
CR 386	15th Street - GCP Segment 2	1,900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13,735	B
CR 386	GCP Segment 2 - SR 71	1,500	C	8,100	Minor arterial	Undivided	Rural Undeveloped	2	2,600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
	Segment 29, 33-39									
GCP, Seg. 2	CR 386 - SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10,535	B
SR 22	East of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	20,286	D
SR 22	West of GCP, Segment 2	10,300	D	22,200	Minor arterial	Undivided	Urban	2	27,192	E
GCP, Seg. 38-39	South of US 231	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	3,570	B
US 231	Star Ave to the east	18,150	C	45,400	Principal Arterial	Divided	Transitioning into Urban	4	33,111	C
US 231	US 231 (1480' South of CR 388 at Youngstown	15,700	C	45,400	Principal Arterial	Divided	Transitioning into Urban	4	28,911	B

Sources:

Traffic from 2004 FDOT Traffic Data CD & PBS&J traffic counts, and LOS data from FDOT Project Traffic Forecasting Handbook, 2009, and adopted LOS from the following:

1. Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009

2. Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/baydocuments accessed in September 2009

Note:

US 98 and US 231 are assumed to have 6 lanes upstream/downstream of their intersection with GCP in the design year 2032.

The congestion management databases from Gulf and Bay Counties were used to determined adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook

4.3 HOURLY TRAFFIC LOS ANALYSIS AT SELECTED INTERSECTIONS

The traffic analysis was conducted using Synchro traffic software which uses the Highway Capacity Manual (HCM) methodology to determine intersection LOS. Signal timings for all signalized intersections were optimized using Synchro's optimization tool to achieve optimal intersection operating conditions and traffic progression. The Synchro HCM intersection capacity analysis reports and Queuing and Blocking Reports are included in this report in Appendix F.

4.3.1 Existing Year (2005) Intersections LOS Analysis

The existing year (2005) peak hour turning movement volumes for the AM and PM peak period at selected intersections using existing intersection arrangements and number of lanes were input into Synchro to analyze LOS conditions. Table 4-3 summarizes the LOS results for existing conditions.

Table 4-3: Existing (2005) Year Intersection LOS (No-Build Scenario)

Intersections	AM LOS	PM LOS
US 98 and CR 386	**F**	**F**
SR 22 and Star Avenue	**E**	**E**
Star Avenue and US 231	B	C
US 98 and Tram Road	**F**	**F**

The results indicate that the LOS at the study intersections is currently below the FDOT standard with the exception of intersection SR 22 and Star Avenue.

4.3.2 Future Year (Opening: 2012 and Design: 2032) Intersections LOS Analysis

Eighteen (18) intersection types along the GCP alignments were identified to evaluate operational conditions with various arrangements, number of lanes and intersection control types. These intersections were analyzed as either two-way stop controlled, all-way stop controlled, or signalized intersections with optimized signal timings on existing geometry to determine if signalization was required to achieve acceptable intersection LOS. If signal controlled operation could not achieve acceptable LOS conditions, then additional analysis was conducted to determine if additional geometric improvements were required to meet acceptable LOS.

Table 4-4 summarizes the future capacity analyses for study intersections in both opening year (2012) and design year (2032).

Table 4-4: Future Year (2012 and 2032) Intersection LOS

Intersection Type 1: US 98 and GCP/CR386		
2012 DHV	***AM LOS***	***PM LOS***
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	B	B
Signalized with Improvements (EB LT, WB RT, Dual SB LT, SB RT)	A	A
2032 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**F**	**F**
Signalized with Improvements (EB LT, Dual EB TH, Dual WB TH/Shared RT, WB RT, Dual SB LT, SB RT)	B	B
Intersection Type 2: CR 386 and GCP		
2012 DHV		
Unsignalized with Existing Geometry	B	B
Signalized with Existing Geometry	B	B
Signalized with Improvements (EB: LT, TH, WB: TH, RT, SB: LT, RT)	A	A
2032 DHV		
Unsignalized with Existing Geometry	**E**	**F**
Signalized with Existing Geometry	B	C
Signalized with Improvements (Dual EB LT/Shared TH, EB TH, Dual WB TH/Shared RT, SB: LT, RT)	A	A
Intersection Type 3: SR 22 and GCP Seg. 2, 16		
2012 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**F**	**F**
Signalized with Improvements (WB: LT, TH, RT, NB RT, SB LT)	B	B
2032 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**F**	**F**
Signalized with Improvements (EB LT, 2 EB TH/Shared RT, WB: LT, 2TH, RT, SB: 2LT, Dual SB TH/Shared RT, NB: LT, 2TH/Shared RT)	C	C
Intersection Type 3A: SR 22 and GCP Seg. 2, 29		
2012 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**E**	**E**
Signalized with Improvement (WB: LT, EB RT, NB: LT)	C	B
2032 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**F**	**F**
Signalized with Improvement (EB: LT, 2 EB TH, RT, WB: LT, 2TH, RT, SB: LT, SB TH/Shared RT, NB: 2 LT, 2TH/Shared RT)	C	C
Intersection Type 4: SR 22 East and GCP Seg. 9, 10		
2012 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	B	B
Signalized with Improvement (EB RT)	B	A
Table 4-4 Future Year (2012 and 2032) Intersection LOS (cont.)		
2032 DHV	***AM LOS***	***PM LOS***

Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	D	**E**
Signalized with Improvement (EB: TH, RT, WB TH, NB: 2 LT, RT)	A	A
Intersection Type 5: SR 22 West and GCP Seg. 15		
2012 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**F**	**E**
Signalized with Improvements (WB RT, Dual SB LT/Shared RT)	A	B
2032 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**F**	**F**
Signalized with Improvements (WB: RT, 2TH, Dual SB LT/ Shared RT)	A	B
Intersection Type 5A: SR 22 West and GCP Seg. 30		
2012 DHV		
Unsignalized with Existing Geometry	C	D
Signalized with Existing Geometry	A	A
2032 DHV		
Unsignalized with Existing Geometry	C	D
Signalized with Existing Geometry	A	A
Signalized with Improvement (EB: LT, TH, WB TH, RT)	A	A
Intersection Type 5B: SR 22 West and GCP Seg. 13, 40		
2012 DHV		
Unsignalized with Existing Geometry	C	D
Signalized with Existing Geometry	A	A
2032 DHV		
Unsignalized with Existing Geometry	**F**	**F**
Signalized with Existing Geometry	**E**	**E**
Signalized with Improvements (WB: RT, 2TH, Dual SB LT/ Shared RT)	B	B
Intersection Type 6: GCP Seg. 20, 22 and GCP Seg. 24		
2012 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	D	C
Signalized with Improvements (EB: LT, NB: LT)	B	B
2032 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	**F**	**F**
Signalized with Improvements 4 lanes in each direction (EB: Shared LT/RT, RT, Dual NB LT and TH)	B	B
Intersection Type 6A: GCP Seg. 17, 21 and GCP Seg. 23		
2012 DHV		
Unsignalized with 2 lanes in each direction	D	**E**
Signalized with 2 lanes in each direction	A	A
2032 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	C	C
Signalized with Improvements 4 lanes in each direction (EB: LT, WB: RT)	A	A

Table 4-4 Future Year (2012 and 2032) Intersection LOS (cont.)

Intersection Type 7: Star Avenue and GCP Seg. 21, 22, 25		

2012 DHV	*AM LOS*	*PM LOS*
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	C	C
Signalized with Improvements (NB/SB/WB/EB: LT, TH/Shared RT)	B	B
2032 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	**F**	**F**
Signalized with Improvements 4 lanes in each direction (NB/SB: LT, Dual TH/Shared RT, EB/WB: LT, 2 TH, RT)	B	B
Intersection Type 8: Star Avenue, GCP Seg. 26 and GCP Seg. 17,21, 25		
2012 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	C	D
Signalized with Improvements (NB/SB/WB/EB: LT, TH/Shared RT)	B	B
2032 DHV		
Unsignalized with 2 lanes in all direction	**F**	**F**
Signalized with 2 lanes in all direction	**F**	**F**
Signalized with Improvements 4 lanes in each direction (NB/SB: LT, Dual TH/Shared RT, EB/WB: LT, 2 TH, RT)	B	B
Intersection Type 10: Star Avenue and GCP Seg. 26, 27		
2012 DHV		
Unsignalized with 2 lanes in each direction	B	C
Signalized with 2 lanes in each direction	B	B
Signalized with Improvements (NB: LT,TH, SB:TH, RT, EB: LT, RT)	A	A
2032 DHV		
Unsignalized with 2 lanes in all direction	**F**	**F**
Signalized with 2 lanes in all direction	D	C
Signalized with Improvements 4 lanes in each direction (NB: LT, 2 TH, Dual SB TH/Shared RT, EB: LT, RT)	B	B
Intersection Type 10A: John Pitts Road and GCP Seg. 28		
2012 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	B	B
Signalized with Improvements (NB: RT, SB: LT)	A	A
2032 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	**F**	**F**
Signalized with Improvements 4 lanes in each direction (NB: RT, SB: LT)	A	A
Intersection Type 10B: US 231 and Star Avenue, GCP Seg 28		
2012 DHV	*AM LOS*	*PM LOS*
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	C	D
Signalized with improvements (6 lanes US 231 with Interim scenario)	C	C
Table 4-4 Future Year (2012 and 2032) Intersection LOS (cont.)		
2032 DHV	*AM LOS*	*PM LOS*
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	**F**	**F**
Signalized with Existing Geometry (6 lanes US 231 with Interim scenario)	**E**	**F**

Signalized with Existing Geometry (4 lanes US 231 with Full Buildout scenario)	**E**	**E**
Signalized with Existing Geometry (6 lanes US 231 with Full Buildout scenario)	C	D
Intersection Type 11: Star Avenue and GCP Seg. 23, 24		
2012 DHV		
Unsignalized with 2 lanes in each direction	D	C
Signalized with 2 lanes in each direction	B	B
Signalized with Improvements (NB/WB: LT, TH/Shared RT, EB: RT)	A	A
2032 DHV		
Unsignalized with 2 lanes in each direction	**F**	**F**
Signalized with 2 lanes in each direction	C	C
Signalized with Improvements 4 lanes in each direction (NB/SB: LT, Dual TH/Shared RT, EB/WB: LT, 2 TH, RT)	B	B
Intersection Type 13: US 231 and GCP Seg 30, 38, 39		
2012 DHV		
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	A	A
Signalized with improvements (6 lanes US 231 with Interim scenario)	A	A
2032 DHV		
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	B	B
Signalized with Existing Geometry (6 lanes US 231 with Interim scenario)	A	A
Signalized with Existing Geometry (4 lanes US 231 with Full Buildout scenario)	B	B
Signalized with Existing Geometry (6 lanes US 231 with Full Buildout scenario)	A	B
Intersection Type 14: US 231 and GCP Seg 41, 42		
2012 DHV		
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	A	A
Signalized with improvements (6 lanes US 231 with Interim scenario)	A	A
2032 DHV		
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	B	B
Signalized with Existing Geometry (6 lanes US 231 with Interim scenario)	A	A
Signalized with Existing Geometry (4 lanes US 231 with Full Buildout scenario)	B	B
Signalized with Existing Geometry (6 lanes US 231 with Full Buildout scenario)	A	B

Note: Bold values indicate unacceptable conditions.

The results of the future traffic analysis indicate that all of the proposed intersections will operate at an acceptable LOS with signalization and the proposed improvements.

Tables 4-5 and 4-6 present the LOS results for the intersection of future GCP/US 231 and US 98/Tram Road in opening year (2012) and design year (2032).

Table 4-5: Future Year LOS for US 231 @ GCP

Intersection Type 12: US 231 and GCP Seg. 23, 24, 27		
2012 DHV	**AM LOS**	**PM LOS**
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	C	C
Signalized with improvements (6 lanes US 231 with Interim scenario)	B	B

2032 DHV	AM LOS	PM LOS
Signalized with Existing Geometry (4 lanes US 231 with Interim scenario)	**E**	**E**
Signalized with Existing Geometry (6 lanes US 231 with Interim scenario)	C	D
Signalized with Existing Geometry (4 lanes US 231 with Full Buildout scenario)	D	C
Signalized with Existing Geometry (6 lanes US 231 with Full Buildout scenario)	A	B

Note: Bold values indicate unacceptable conditions.

A detailed analysis of the GCP @ US 231/CR 390/CR 2321 (GCP North Termini) Traffic Analysis Technical Memorandum is included in Appendix D. The results of the 2012 scenario traffic condition analysis for US 231 and GCP indicate that the intersection LOS would operate at LOS C or better with the Interim Scenario, and the 2032 scenario traffic conditions analysis Indicates that US 231 and GCP would have unacceptable LOS conditions if US 231 remains a four-lane facility with Interim Scenario. With US 231 widened to 6 lanes and the full build-out scenario, the intersection would operate at LOS B or better.

Table 4-6: Future Year LOS for US 98 @ Tram Road

Intersection Type 9: Tram Road and GCP Seg. 25		
2012 DHV	**AM LOS**	**PM LOS**
Signalized with Existing Geometry (Initial Scenario)	**E**	D
Signalized with improvements (WB: Dual LT lane and a single RT lane with Initial scenario)	B	B
2032 DHV	**AM LOS**	**PM LOS**
Signalized with Existing Geometry (Initial scenario)	**F**	**F**
Signalized with improvements (6 lanes US 98 with final scenario)	A	B

A detailed analysis of the GCP @ US 98 / Tram Road (Tram Road Termini) Alternative Traffic Analysis Technical Memorandum is included in Appendix E.

For the Initial Scenario, the existing signalized intersection of US 98 and Tram Road/GCP was analyzed having only an additional northbound right turn lane on US 98. The results of the 2012 Initial Scenario traffic condition analysis indicate that US 98 and Tram Road/GCP would operate with unacceptable LOS conditions during the AM peak hour with the existing intersection arrangement and number of lanes. With the Tram Road/GCP approach having dual left turn lanes and a single right turn lane, the intersection would operate at LOS B. Also, for the design year (2032), the intersection would have unacceptable LOS F conditions unless US 98 is widened to six lanes. With a six lane US 98, the intersection would operate at LOS B or better.

4.4 QUEUING ANALYSIS

A queuing analysis was performed for each of the intersections with future 2032 traffic conditions. The traffic simulation for each of the scenarios was run for an hour with a peak 15-minute interval to simulate a peak hour with peaking traffic characteristics in SimTraffic. The SimTraffic Queuing and Blocking Reports were used to evaluate queues at each of the study intersections and are included with this memorandum. The 95th percentile queue lengths for each movement from the SimTraffic reports were rounded to the nearest 25 feet, with a minimum queue length of 50 feet. Table 4-7 summarizes the queuing analysis results.

Table 4-7: Queuing Analysis

Intersection	Movement	95th Percentile Queue Length (ft)
Intersection Type 1: US 98 and GCP/CR386	WB TR	150
	EB L	175
	SB L	250
Intersection Type 2: CR 386 and GCP	EB LT	150
	WB TR	100
	SB L	50
	SB R	150
Intersection Type 3: SR 22 and GCP Seg. 2, 16	EB L	100
	EB TR	425
	WB L	225
	WB T	300
	NB L	100
	NB TR	275
	SB L	150
	SB TR	175
Intersection Type 3A: SR 22 and GCP Seg. 2, 29	EB L	75
	EB R	125
	WB L	125
	WB R	50
	NB L	200
	NB TR	250
	SB L	50
	SB TR	200
Intersection Type 4: SR 22 East and GCP Seg. 9, 10	EB TR	100
	EB R	75
	WB LT	125
	NB L	150
	NB R	50
Intersection Type 5: SR 22 West and GCP Seg. 15	EB LT	175
	EB T	200
	WB T	150
	SB L	300
	SB R	50
Intersection Type 5A: SR 22 West and GCP Seg. 30	EB L	75
	EB T	375
	WB T	225
	WB R	50
	SB LR	100
Intersection Type 5B: SR 22 West and GCP Seg. 13, 40	EB LT	250
	EB R	125
	NB L	150
	NB TR	50
Intersection Type 6: GCP Seg. 20, 22 and GCP Seg. 24	EB LR	175
	EB R	150
	NB L	200
	NB T	75
	SB TR	125

Note: L = Left, T = Through, R = Right, LT = Shared Left/Through, TR = Shared Through/Right

Table 4-7 Queuing Analysis (cont.)

Intersection Type 6A: GCP Seg. 17, 21 and GCP Seg. 23	EB L	125
	EB T	300
	WB T	250
	WB R	75
	SB LR	175
Intersection Type 7: Star Avenue and GCP Seg. 21, 22, 25	EB L	100
	EB T	225
	EB R	50
	WB L	200
	WB T	200
	WB R	75
	NB L	125
	NB TR	200
	SB L	125
	SB TR	150
Intersection Type 8: Star Avenue, GCP Seg. 26 and GCP Seg. 17, 21, 25	EB L	150
	EB T	200
	EB R	75
	WB L	125
	WB T	200
	WB R	100
	NB L	100
	NB TR	175
	SB L	225
	SB TR	200
Intersection Type 10: Star Avenue and GCP Seg. 26, 27	EB L	50
	EB R	250
	NB L	225
	NB T	100
	SB TR	125
Intersection Type 10A: John Pitts Road and GCP Seg. 28	WB LR	300
	NB T	125
	NB R	75
	SB L	200
	SB T	150
Intersection Type 10B: US 231 and Star Avenue, GCP Seg 28	EB R	1225
	WB L	300
	NB L	325
	NB R	125
Intersection Type 11: Star Avenue and GCP Seg. 23, 24	EB L	50
	EB T	100
	EB R	75
	WB L	50
	WB T	100
	NB L	175
	NB TR	75
	SB L	50
	SB TR	125

Note: L = Left, T = Through, R = Right, LT = Shared Left/Through, TR = Shared Through/Right

Table 4-7 Queuing Analysis (cont.)		
Intersection Type 13: US 231 and GCP Seg 30, 38, 39	EB TR	400
	WB L	75
	WB T	300
	NB LR	100
Intersection Type 14: US 231 and GCP Seg 41, 42	EB TR	300
	WB L	75
	WB T	250
	NB LR	100

Note: L = Left, T = Through, R = Right, LT = Shared Left/Through, TR = Shared Through/Right

5.0 UPDATED TRAFFIC INFORMATION

The updating of traffic for this project was undertaken using the same methodology as shown in section 3.1.1. Existing traffic counts were updated to the year 2012 using primarily FDOTs' 2011 Florida Transportation Information DVD. From this point the creation of future year traffic followed the exact same process as is detailed in section 3.1.1 of this report which includes the years 2012, 2022, and 232

This section documents the newly developed 2012 and 2025 and 2035 traffic.

5.1 AADT

Tables 5-1a through 5-1e show the new AADTS by Alternative for 2011, 2012, 2025 and 2035. numbers.

Table 5-1a. Future Traffic (Including DRI traffic): Alternative 8

Roadway	Segment	Year 2011 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2025 AADT	Year 2035 AADT
	Segment 1				
US 98	East of CR 386	10,000	12,980	15,852	19,165
US 98	West of CR 386	9,200	5,000	6,100	7,500
CR 386	North of US 98	5,200	13,214	16,222	19,635
CR 386	US 98 - 15th Street	1,700	9,214	11,322	13,635
CR 386	15th Street - GCP Segment 3	1,900	9,414	11,622	13,935
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 3	North of Overstreet (CR 386, Gulf Co.)	0	7,214	8,922	10,735
CR 386	West of GCP, Segment 3 (Gulf Co.)	1,900	9,414	11,622	13,935
CR 386	East of GCP, Segment 3 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3, 8, 10, 14, 15				
GCP, Seg 3,8,10	CR 386 - SR 22	0	7,314	8,922	10,735
GCP, Seg 3,8,10	South of SR 22	0	7,314	8,922	10,735
SR 22	East of GCP, Segment 10	2,800	3,814	4,664	5,751
SR 22	West of GCP, Segment 10	3,400	11,828	14,486	17,486
SR 22	GCP, Segment 10 - CR 2297 (Allanton Rd.)	4,300	12,828	15,686	18,986
SR 22	CR 2297 - GCP, Segment 14,15	10,500	20,028	24,386	29,586
SR 22	East of GCP, Segment 15	10,500	20,028	24,386	29,586
SR 22	West of GCP, Segment 15	10,500	11,242	13,672	16,659
GCP, Seg. 15,17,21	North of SR 22	0	9,728	11,886	14,386
	Segments 17,21				
GCP, Seg. 17,21	SR 22 - Tram Road	0	9,728	11,886	14,386
GCP, Seg. 17,21	East of Star Ave	0	9,728	11,886	14,386

Star Ave	South of GCP (South of Tram Rd.)	7,400	6,788	8,309	10,036
GCP, Seg. 25 (Tram Rd)	West of Star Ave	0	8,414	10,243	12,443
Star Ave	North of Tram Rd.	8,300	10,814	13,243	16,143
	Segment 25				
Tram Road	US 98 - Star Ave	0	8,414	10,243	12,443
Tram Road	East of US 98	0	8,414	10,243	12,443
US 98	South of Tram Rd	35,850	29,800	29,500	28,800
US 98	North of Tram Rd.	31,600	30,500	31,100	31,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segments 26,27				
GCP, Seg. 26	Tram Rd - Nehi Rd.	8,300	10,814	13,243	16,143
GCP, Seg 26	South of Nehi-Star Ave intersection	8,300	10,814	13,243	16,143
Star Ave	North of GCP, Segment 26,27	0	4,088	4,909	6,036
GCP, Seg 27	Northwest of Nehi-Star Ave intersection	0	6,814	8,443	10,243
GCP, Seg 27	Star Ave - US 231	0	6,814	8,443	10,243
US 231	West, South west of GCP, Seg. 27	25,800	30,300	36,971	45,085
US 231	East, Northeast of GCP, Seg. 27	30,400	36,262	44,296	54,011
GCP, Seg. 27	South of US 231	0	6,814	8,443	10,243

Sources: Traffic from FDOT 2011 Florida Traffic Information DVD

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 5-1b. Future Traffic (Including DRI traffic): Alternative 14

Roadway	Segment	Year 2011 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2025 AADT	Year 2035 AADT
	Segment 1				
US 98	East of CR 386	10,000	12,980	15,852	19,165
US 98	West of CR 386	9,200	5,000	6,100	7,500
CR 386	North of US 98	5,200	13,214	16,222	19,635
CR 386	US 98 - 15th Street	1,700	9,214	11,322	13,635
CR 386	15th Street - GCP Segment 3	1,900	9,414	11,622	13,935
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	North of Overstreet (CR 386, Gulf Co.)	0	7,314	8,922	10,735
CR 386	West of GCP, Segment 2 (Gulf Co.)	1,900	9,514	11,622	13,935
CR 386	East of GCP, Segment 2 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3, 8, 10, 14, 15, 30				
GCP, Seg 3,8,10	CR 386 - SR 22	0	7,314	8,922	10,735
GCP, Seg 3,8,10	South of SR 22	0	7,314	8,922	10,735
SR 22	East of GCP, Segment 10	2,800	3,814	4,664	5,751
SR 22 - GCP Seg. 14	West of GCP, Segment 10	3,400	11,828	14,486	17,486
SR 22 - GCP Seg.	East of GCP, Segment 30	3,400	11,828	14,486	17,486

14					
	Segment 30				
GCP, Seg. 30	SR 22 - US 231	7,500	1,010	1,358	1,489
GCP, Seg 30.	South of US 231	7,500	1,010	1,358	1,489
US 231	Star Ave to the east	19,200	23,404	27,852	3,369
US 231	US 231 (1,480' South of CR 388 at Youngstown)	16,300	20,654	24,254	29,473

Sources: Traffic from FDOT 2011 Florida Traffic Information DVD

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 5-1c. Future Traffic (Including DRI traffic): Alternative 15

Roadway	Segment	Year 2011 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2025 AADT	Year 2035 AADT
	Segment 1				
US 98	East of CR 386	10,000	12,980	15,852	19,165
US 98	West of CR 386	9,200	5,000	6,100	7,500
CR 386	North of US 98	5,200	13,214	16,222	19,635
CR 386	US 98 - 15th Street	1,700	9,214	11,322	13,635
CR 386	15th Street - GCP Segment 3	1,900	9,414	11,622	13,935
CR 386	GCP Segment 3 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 3	North of Overstreet (CR 386, Gulf Co.)	0	7,214	8,922	10,735
CR 386	West of GCP, Segment 3 (Gulf Co.)	1,900	9,414	11,622	13,935
CR 386	East of GCP, Segment 3 (Gulf Co.)	1,500	1,700	2,100	2,600
	Segments 3, 8, 10, 14, 15, 12, 40				
GCP, Seg 3,8,10	CR 386 - SR 22	0	7,314	8,922	10,735
GCP, Seg 3,8,10	South of SR 22	0	7,314	8,922	10,735
SR 22	East of GCP, Segment 10	2,800	3,814	4,664	5,751
SR 22	West of GCP, Segment 10	3,400	11,828	14,486	17,486
SR 22	West of GCP, Segment 15	10,500	11,242	13,672	16,659
GCP, Seg. 15,17,21	North of SR 22	0	1,010	1,358	1,489
	Segment,13.40.41.42				
GCP, Seg. 13,40,41,42	SR 22 - US 231	7,500	1,010	1,358	1,489
GCP, Seg 41,42	South of US 231	7,500	1,010	1,358	1,489
US 231	Star Ave to the east	16,300	20,654	24,254	29,473
US 231	US 231 (1,480' South of CR 388 at Youngstown)	16,300	20,654	24,254	29,473

Sources: Traffic from FDOT 2011 Florida Traffic Information DVD

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility

since it is already very congested

Table 5-1d. Future Traffic (Including DRI traffic): Alternative 17

Roadway	Segment	Year 2011 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2025 AADT	Year 2035 AADT
	Segment 2				
US 98	East of CR 386	10,000	12,980	15,852	19,165
US 98	West of CR 386	9,200	5,000	6,100	7,500
CR 386	North of US 98	5,200	13,214	16,222	19,635
CR 386	US 98 - 15th Street	1,700	9,214	11,322	13,635
CR 386	15th Street - GCP Segment 2	1,900	9,414	11,622	13,935
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,214	8,922	10,735
CR 386	South of GCP, Segment 2	1,900	9,414	11,622	13,935
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 16, 18, 21				
GCP, Seg. 2	CR 386 - SR 22	0	7,314	8,922	10,735
GCP, Seg. 2	South of SR 22	0	7,314	8,922	10,735
SR 22	CR 2297 - to the east	10,500	13,928	16,986	20,586
SR 22	East of GCP, Segment 2	10,500	13,928	16,986	20,586
SR 22	West of GCP, Segment 2	10,500	11,242	13,672	16,659
GCP, Seg. 16	North of SR 22	0	9,728	11,886	14,386
GCP, Seg. 16, 18, 21	SR 22 - Star Ave	0	9,728	11,886	14,386
GCP, Seg. 21	East of Star Ave	0	9,728	11,886	14,386
Star Ave	South of GCP (South of Tram Rd.)	7,400	6,788	8,309	10,036
GCP, Seg. 25 (Tram Rd)	West of Star Ave	0	8,414	10,243	12,443
Star Ave	North of Tram Rd.	8,300	9,414	11,543	14,043
	Segment 25				
Tram Road	US 98 - Star Ave	0	8,414	10,243	12,443
Tram Road	East of US 98	0	8,414	10,243	12,443
US 98	South of Tram Rd	35,850	29,800	29,500	28,800
US 98	North of Tram Rd.	31,600	30,500	31,100	31,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200
	Segment 26, 27				
Star Ave, S. of Seg. 27	Tram Rd - Seg 27	8,300	9,414	11,543	14,043
Star Ave	North of GCP, Segment 27	0	4,088	4,909	6,036
GCP, Seg 27	West of Star Ave	0	6,814	8,443	10,243
GCP, Seg 27	Star Ave - US 231	0	6,814	8,443	10,243
US 231	West, South west of GCP, Seg. 27	25,800	30,300	36,971	45,085
US 231	East, Northeast of GCP, Seg. 27	30,400	36,262	44,296	54,011
GCP, Seg. 27	South of US 231	0	6,814	8,443	10,243

Sources: Traffic from FDOT 2011 Florida Traffic Information DVD

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility since it is already very congested

Table 5-1e. Future Traffic (Including DRI traffic): Alternative 19

Roadway	Segment	Year 2011 AADT	Background + DRI Traffic		
			Year 2012 AADT	Year 2025 AADT	Year 2035 AADT
	Segment 2				
US 98	East of CR 386	10,000	12,980	15,852	19,165
US 98	West of CR 386	9,200	5,000	6,100	7,500
CR 386	North of US 98	5,200	13,214	16,222	19,635
CR 386	US 98 - 15th Street	1,700	9,214	11,322	13,635
CR 386	15th Street - GCP Segment 2	1,900	9,414	11,622	13,935
CR 386	GCP Segment 2 - SR 71	1,500	1,700	2,100	2,600
GCP, Seg. 2	West of CR 386	0	7,214	8,922	10,735
CR 386	South of GCP, Segment 2	1,900	9,414	11,622	13,935
CR 386	North of GCP, Segment 2	1,500	1,700	2,100	2,600
	Segment 16, 18, 21, 29				
GCP, Seg. 2	CR 386 - SR 22	0	7,314	8,922	10,735
GCP, Seg. 2	South of SR 22	0	7,314	8,922	10,735
SR 22	CR 2297 - to the east	10,500	13,928	16,986	20,586
SR 22	East of GCP, Segment 2	10,500	13,928	16,986	20,586
SR 22	West of GCP, Segment 2	10,500	11,242	13,672	16,659
GCP, Seg. 16, 29	North of SR 22	0	9,728	11,886	14,386
GCP, Seg. 16, 29	South of GCP Seg. 16	0	9,728	11,886	14,386
GCP, Seg. 16, 18	West of GCP Seg. 29	0	9,728	11,886	14,386
GCP, Seg. 18, 21	GCP Seg 29 - Star Ave	0	9,728	11,886	14,386
GCP, Seg. 21	East of Star Ave	0			
Star Ave	South of GCP (South of Tram Rd.)	7,400	6,788	8,309	10,036
GCP, Seg. 25 (Tram Rd)	West of Star Ave	0	8,414	10,243	12,443
Star Ave	North of Tram Rd.	8,300	9,414	11,543	14,043
	Segment 25				
Tram Road	US 98 - Star Ave	0	8,414	10,243	12,443
Tram Road	East of US 98	0	8,414	10,243	12,443
US 98	South of Tram Rd	35,850	29,800	29,500	28,800
US 98	North of Tram Rd.	31,600	30,500	31,100	31,700
14th Street	West of Tyndall Prkwy (US 98)	700	800	1,000	1,200

Sources: Traffic from FDOT 2011 Florida Traffic Information DVD

Notes:

Shadowed cells are main intersection traffic volumes

Traffic growth rate on US 98 within Panama City is reduced to the annual trend rate projected for this specific facility

since it is already very congested

The comparison of these new 2035 numbers to the old 2032 shows very little growth at all in the area.

5.2 DESIGN YEAR ROAD SEGMENT LOS

The tables on the following show the design year Level of Service for all scenarios.

Table 5-2a: Design Year Road Segment LOS: Alternative 8

Roadway	Segment	Year 2011 AADT	Adopted LOS Standard	LOS Maximum Volume	Functional Classification	Facility Type	Area Type	No. Of Lanes	2035 AADT	2035 LOS
	Segment 1									
US 98	East of CR 386	10000	C	14,200	Principal Arterial	Undivided	Rural Developed	2	19165	D
US 98	West of CR 386	9200	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7500	B
CR 386	US 98 – 15th St.	1700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13635	B
CR 386	15th St. – GCP Segment 3	1900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13935	B
CR 386	GCP Segment 3 – SR 71	1500	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	2600	B
	Segments 3, 8, 10, 14, 15									
GCP, Seg. 3, 8, 10	CR 386 – SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
SR 22	East of GCP, Segment 10	2800	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	5751	C
SR 22	GCP, Segment 10 – CR 2297 (Allanton Rd.)	4300	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	18986	B
SR 22	East of GCP, Segment 15	10500	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	29586	C
SR 22	West of GCP, Segment 15	10500	C	15,100	Minor Arterial	Undivided	Transitioning to Urban	2	16659	D
GCP, Seg. 15, 17,21	North of SR 22	0	B	31,400	Principal Arterial	Divided	Transitioning to Urban	4	14386	B
	Segments 17, 21									
GCP 17, 21	SR 22 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	14386	B
Star Avenue	South of GCP (South of Tram Rd.)	7400	D	14,850	Urban Collector	Undivided	Urban	2	10036	C
GCP Seg. 25 (Tram Rd.)	West of Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
Star Avenue	North of Tram Road	8300	D	36,700	Principal Arterial	Divided	Urban	4	16143	B
	Segment 25									
Tram Road	US 98 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
US 98	South of Tram Road	35850	D	55,300	Principal Arterial	Divided	Urban	6	51000	C
US 98	North of Tram Road	31600	D	55,300	Principal Arterial	Divided	Urban	6	51200	C
14th Street	West of Tyndall Parkway (US 98)	700	D	14,850	Minor Collector	Undivided	Urban	2	1200	B
	Segment 26, 27									
GCP, Seg. 26	Tram Road – Nehi Road	8300	D	36,700	Principal Arterial	Divided	Urban	4	16143	B
Star Avenue (Seg. 28)	North of GCP, Segment 26, 27	0	D	14,850	Urban Collector	Undivided	Urban	2	6036	B
GCP, Seg. 27	Star Avenue – US 231	0	D	36,700	Principal Arterial	Divided	Urban	4	10243	B
US 231	West, Southwest of GCP, Seg. 27	25800	D	55,300	Principal Arterial	Divided	Urban	6	45085	C
US 231	East, Northeast of GCP, Seg. 27	30400	D	55,300	Principal Arterial	Divided	Urban	6	54011	D
Sources;										

Traffic from 2011 FDOT Florida Traffic Information DVD
LOS data from FDOT Project Traffic Forecasting Handbook (2009), and
Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009
Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/bay documents accessed in September 2009
Note: Letters in **BOLD** reflect a LOS below recommended value
SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.
The congestion management databases from Gulf and Bay Counties were used to determine adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook.

Table 5-2b: Design Year Road Segment LOS: Alternative 14

Roadway	Segment	Year 2011 AADT	Adopted LOS Standard	LOS Maximum Volume	Functional Classification	Facility Type	Area Type	No. Of Lanes	2035 AADT	2035 LOS
	Segment 1, 3									
US 98	East of CR 386	10000	C	14,200	Principal Arterial	Undivided	Rural Developed	2	19165	**D**
US 98	West of CR 386	9200	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7500	B
CR 386	US 98 – 15th Street	1700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13635	B
CR 386	15th Street – GCP Segment 3	1900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13935	B
CR 386	GCP Segment 3 – SR 71	1500	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	2600	B
	Segments 3, 8, 10, 15									
GCP, Seg. 3, 8, 10	CR 386 – SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
SR 22	East of GCP, Segment 10	2800	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	5751	C
SR 22 GCP Seg. 14	West of GCP, Segment 10	3400	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	17486	B
SR 22 GCP Seg. 15	West of GCP, Segment 30	10500	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	29586	B
SR 22	West of GCP, Segment 15	10500	D	21.100	Minor Arterial	Undivided	Transitioning to Urban	2	17250	D
GCP, Seg 15, 17, 21	North of SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1489	B
	Segments 17, 21									
GCP Seg. 17, 21	SR 22 – Tram Road	0	D	36,700	Principal Arterial	Divided	Urban	4	14386	B
Star Avenue	South of GCP (South of Tram Rd.)	7400	D	14,850	Urban Collector	Undivided	Urban	2	10036	C
GCP Seg. 25 (Tram Rd.)	West of Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
Star Avenue	North of Tram Road	8300	D	36,700	Principal Arterial	Divided	Urban	4	16143	B
	Segment 25									
Tram Road	US 98 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
US 98	South of Tram Road	35850	D	55,300	Principal Arterial	Divided	Urban	6	51000	C
US 98	North of Tram Road	31600	D	55,300	Principal Arterial	Divided	Urban	6	51200	C
14th Street	West of Tyndall Parkway (US 98)	700	D	14,850	Minor Collector	Undivided	Urban	2	1200	B
	Segment 30, 31, 36-38									
GCP, Seg. 30, 31, 36-38	SR 22 – US 231	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1489	B
US 231	Star Avenue to East	100	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	44296	C
US 231	US 231 (1,480 feet south of CR 388)	0	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	30523	C
Sources;										

Traffic from 2011 FDOT Florida Traffic Information DVD
LOS data from FDOT Project Traffic Forecasting Handbook (2009), and
Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009
Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/bay documents accessed in September 2009
Note: Letters in **BOLD** reflect a LOS below recommended value
SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.
The congestion management databases from Gulf and Bay Counties were used to determine adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook.

Table 5-2c: Design Year Road Segment LOS: Alternative 15

Roadway	Segment	Year 2011 AADT	Adopted LOS Standard	LOS Maximum Volume	Functional Classification	Facility Type	Area Type	No. Of Lanes	2035 AADT	2035 LOS
	Segment 1									
US 98	East of CR 386	10000	C	14,200	Principal Arterial	Undivided	Rural Developed	2	19165	D
US 98	West of CR 386	9200	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7500	B
CR 386	US 98 – 15th Street	1700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13635	B
CR 386	15th Street – GCP Segment 3	1900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13935	B
CR 386	GCP Segment 3 – SR 71	1500	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	2600	B
	Segments 3, 8, 10, 14, 15, 12, 40									
GCP, Seg. 3, 8, 10	CR 386 – SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
SR 22	East of GCP, Segment 10	2800	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	5751	C
SR 22- GCP Seg. 14	West of GCP, Segment 10	3400	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	17486	B
SR 22 – GCP Seg. 15	West of GCP, Segment 14	3400	C	41,100	Principal Arterial	Divided	Rural Undeveloped	4	17486	B
SR 22	West of GCP, Segment 15	10500	D	21,100	Minor Arterial	Undivided	Transitioning to Urban	2	16659	D
GCP, Seg. 12, 40	North of SR 22	100	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1489	B
	Segments 17, 21									
GCP Seg. 17, 21	SR 22 – Tram Road	0	D	36,700	Principal Arterial	Divided	Urban	4	14386	B
Star Avenue	South of GCP (South of Tram Rd.)	7400	D	14,850	Urban Collector	Undivided	Urban	2	10036	C
GCP Seg. 25 (Tram Rd.)	West of Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
Star Avenue	North of Tram Road	8300	D	36,700	Principal Arterial	Divided	Urban	4	16143	B
	Segment 25									
Tram Road	US 98 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	**B**
US 98	South of Tram Road	35850	D	55,300	Principal Arterial	Divided	Urban	6	51000	C
US 98	North of Tram Road	31600	D	55,300	Principal Arterial	Divided	Urban	6	51200	C
14th Street	West of Tyndall Parkway (US 98)	700	D	14,850	Minor Collector	Undivided	Urban	2	1200	B
	Segment 12, 40, 41									
GCP, Seg. 40, 41	SR 22 – US 231	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1513	B
US 231	Star Avenue to East	21000	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	29243	B
US 231	US 231 (1,480 feet south of CR 388)	20000	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	29243	B
Sources;										

Traffic from 2011 FDOT Florida Traffic Information DVD
LOS data from FDOT Project Traffic Forecasting Handbook (2009), and
Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009
Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/bay documents accessed in September 2009
Note: Letters in **BOLD** reflect a LOS below recommended value
SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.
The congestion management databases from Gulf and Bay Counties were used to determine adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook.

Table 5-2d: Design Year Road Segment LOS: Alternative 17

Roadway	Segment	Year 2011 AADT	Adopted LOS Standard	LOS Maximum Volume	Functional Classification	Facility Type	Area Type	No. Of Lanes	2035 AADT	2035 LOS
	Segment 2									
US 98	East of CR 386	10000	C	14,200	Principal Arterial	Undivided	Rural Developed	2	19165	D
US 98	West of CR 386	9200	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7500	B
CR 386	US 98 – 15th Street	1700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13635	B
CR 386	15th Street – GCP Segment 2	1900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13935	B
CR 386	GCP Segment 2 – SR 71	1500	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	2600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
	Segments 16, 18, 21									
GCP, Seg. 2	CR 386 – SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
SR 22	East of GCP, Segment 2	10500	D	22,200	Minor Arterial	Undivided	Urban	2	20586	D
SR 22	West of GCP, Segment 2	10500	D	22,200	Minor Arterial	Undivided	Urban	2	16659	D
GCP Seg 16, 18,21	SR 22 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	14386	B
Star Avenue	South of GCP (South of Tram Rd.)	7400	D	14,850	Urban Collector	Undivided	Urban	2	10036	C
GCP Seg. 25 (Tram Road)	West of Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
Star Avenue (GCP Seg 26)	North of Tram Road	8300	D	36,700	Principal Arterial	Divided	Urban	4	14043	B
	Segment 25									
Tram Road	US 98 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
US 98	South of Tram Road	35850	D	55,300	Principal Arterial	Divided	Urban	6	51000	C
US 98	North of Tram Road	31600	D	55,300	Principal Arterial	Divided	Urban	6	51200	C
14th Street	West of Tyndall Parkway (US 98)	700	D	14,850	Minor Collector	Undivided	Urban	2	1200	B
	Segment 26, 27									
Star Ave. South of Seg. 27	Tram Road – Segment 27	8300	D	36,700	Principal Arterial	Divided	Urban	4	14043	B
Star Avenue	North of GCP, Segment 27	0	D	14,850	Urban Collector	Undivided	Urban	2	6036	B
GCP, Segment 27	West of Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	10243	B
US 231	West, Southwest of GCP Seg 27	25800	D	55,300	Principal Arterial	Divided	Urban	6	45085	C
US 231	East, Northeast of GCP Seg. 27	30400	D	55,300	Principal Arterial	Divided	Urban	6	54011	D
Sources;										

Traffic from 2011 FDOT Florida Traffic Information DVD
LOS data from FDOT Project Traffic Forecasting Handbook (2009), and
Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009
Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/bay documents accessed in September 2009
Note: Letters in **BOLD** reflect a LOS below recommended value
SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.
The congestion management databases from Gulf and Bay Counties were used to determine adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook.

Table 5-2e: Design Year Road Segment LOS: Alternative 19

Roadway	Segment	Year 2011 AADT	Adopted LOS Standard	LOS Maximum Volume	Functional Classification	Facility Type	Area Type	No. Of Lanes	2035 AADT	2035 LOS
	Segment 2									
US 98	East of CR 386	10000	C	14,200	Principal Arterial	Undivided	Rural Developed	2	19165	D
US 98	West of CR 386	9200	C	14,200	Principal Arterial	Undivided	Rural Developed	2	7500	B
CR 386	US 98 – 15th Street	1700	B	23,800	Principal Arterial	Divided	Rural Developed	4	13635	B
CR 386	15th Street – GCP Segment 2	1900	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	13935	B
CR 386	GCP Segment 2 – SR 71	1500	C	8,100	Minor Arterial	Undivided	Rural Undeveloped	2	2600	B
GCP, Seg. 2	West of CR 386	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
	Segments 16, 18, 21									
GCP, Seg. 2	CR 386 – SR 22	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	10735	B
SR 22	East of GCP, Segment 2	10500	D	22,200	Minor Arterial	Undivided	Urban	2	20586	D
SR 22	West of GCP, Segment 2	10500	D	22,200	Minor Arterial	Undivided	Urban	2	16659	D
GCP Seg 16, 18,21	SR 22 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	13986	B
Star Avenue	South of GCP (South of Tram Rd.)	7400	D	14,850	Urban Collector	Undivided	Urban	2	10036	**C**
GCP Seg. 25 (Tram Road)	West of Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	B
Star Avenue (GCP Seg 26)	North of Tram Road	8300	D	36,700	Principal Arterial	Divided	Urban	4	14043	B
	Segment 25									
Tram Road	US 98 – Star Avenue	0	D	36,700	Principal Arterial	Divided	Urban	4	12443	**B**
US 98	South of Tram Road	35850	D	55,300	Principal Arterial	Divided	Urban	6	51000	C
US 98	North of Tram Road	31600	D	55,300	Principal Arterial	Divided	Urban	6	51200	C
14th Street	West of Tyndall Parkway (US 98)	700	D	14,850	Minor Collector	Undivided	Urban	2	1200	B
	Segment 29, 34, 36-38									
GCP Seg. 29, 34, 36-38	GCP Seg. 16 - US 231	0	B	26,300	Principal Arterial	Divided	Rural Undeveloped	4	1513	B
US 231	Star Avenue to the East	21000	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	33425	C
US 231	US 231 (1,480" south of CR 388)	20000	C	45,400	Principal Arterial	Divided	Transitioning to Urban	4	29243	B
Sources;										

Traffic from 2011 FDOT Florida Traffic Information DVD
LOS data from FDOT Project Traffic Forecasting Handbook (2009), and
Year 2007 Gulf Co. LOS Report provided by Apalachee Regional Planning Council planning staff in September 2009
Year 2009 Bay Co. Congestion Management System Plan Report, Bay County Transportation Planning Organization, from www.wfrpc.org/bay documents accessed in September 2009
Note: Letters in **BOLD** reflect a LOS below recommended value
SR 22 is assumed to have capacity (4-lane) improvements upstream/downstream of its intersection with GCP.
The congestion management databases from Gulf and Bay Counties were used to determine adopted LOS and road class only. Actual LOS volumes were obtained from the 2009 FDOT's QLOS Handbook.

5.3 MODIFIED INTERSECTION CONFIGURATIONS

The configuration of the intersection of Tram Road (Gulf Coast Parkway Segment 25) at US 98, as well as the intersection of Nehi Road (Gulf Coast Parkway Segment 26) at US 231, were handled as special cases because their conceptual geometric design, based on traffic demand, called for a redesigned layout. For Tram Road and US 98 this required a new intersection configuration with improvement to US 98. For the Nehi Road and US 231 intersection a new grade separated intersection was required. Figures illustrating these intersections are which are presented in Figures 5-1 and 5-2.

Directional Design Hour Volume (DDHV) were developed for both the AM and PM peak periods at all the major intersections of the new proposed road and for existing intersections within the study area.

Appendix G shows the operational analysis of these intersections.

Figure 5-1: US 98 (Tyndall Parkway)/Gulf Coast Parkway (Tram Road) Intersection Configuration DDHV

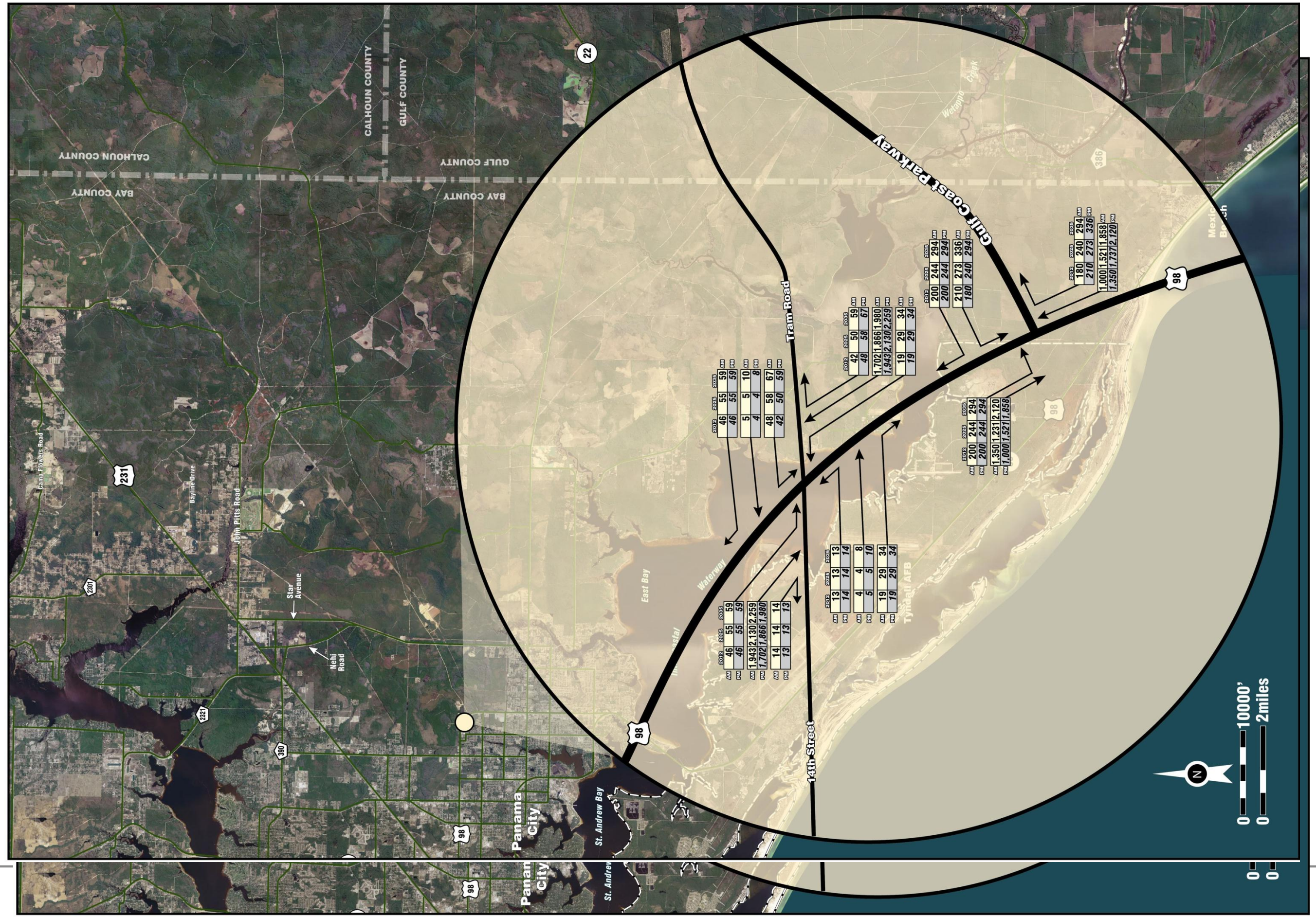
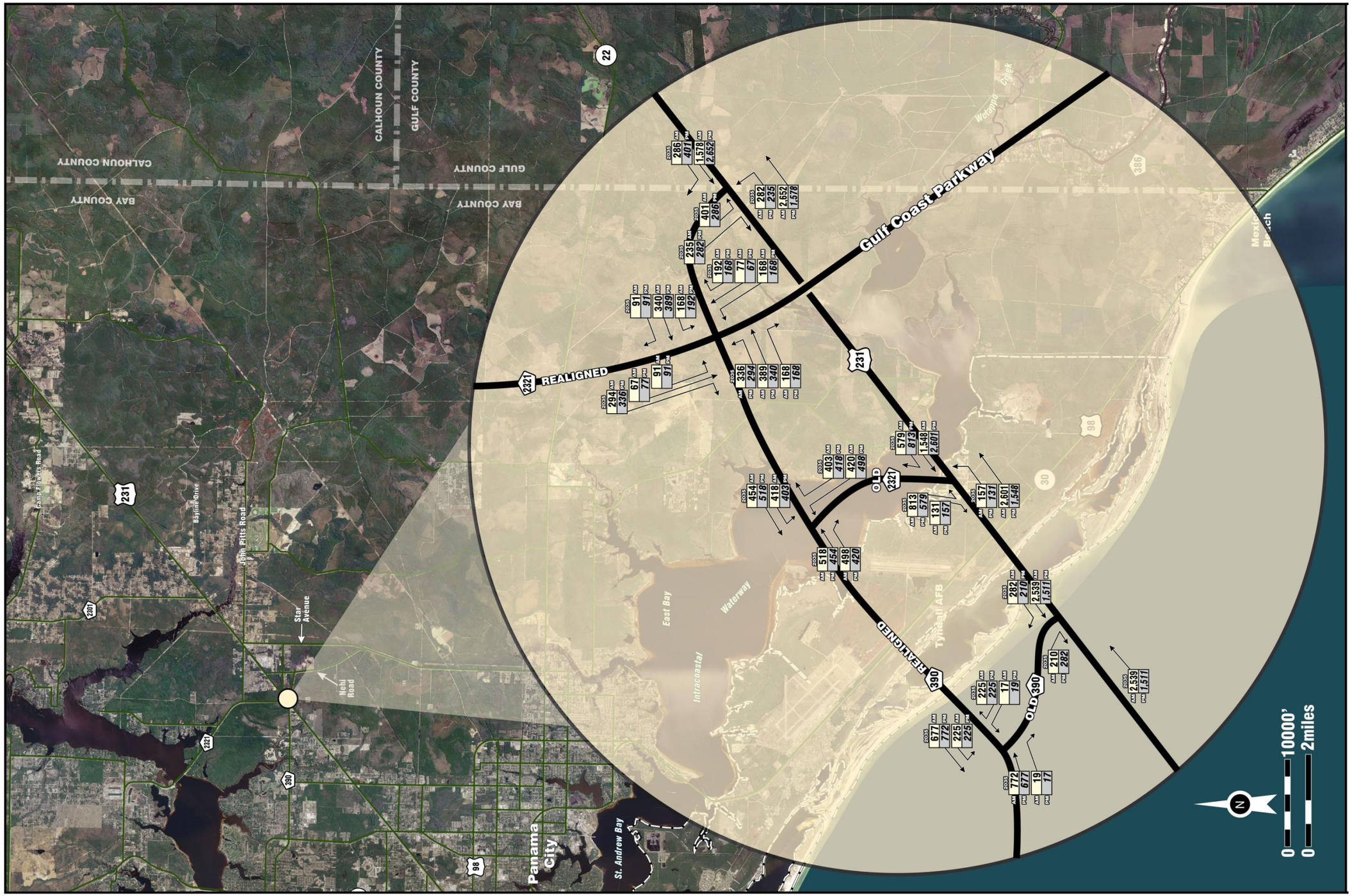


Figure 5-2: US 231/Gulf Coast Parkway (Nehi Road) Intersection Configuration DDHV



5.4 CONCLUSIONS

The updated traffic shows minimal growth even though the base year was updated from 2007 to 2012 (from 2011 traffic counts) and the horizon year went from 2032 to 2035. This is not surprising given the rural nature of most of the study area and the state of the economy over the past few years.

Based on the Segment LOS analysis from section 5.2 and the AADT from section 5.1, further analysis of traffic operations is not warranted as there is little to no increase in traffic and that most of the GCP alternatives either use existing facilities or new 2 lane roadways which would not have any reduction in lanes due to less traffic in the future.

The major intersections with US 98 and GCP/Tram Road and US 231 and GCP were analyzed to ensure that they will still work and to see if they could be reduced in their complexity.

In conclusion, the updated traffic does not change the outcome of the analysis that has been done in the previous update to this report.

6.0 REFERENCES

1. Project Traffic Forecasting Handbook, Florida Department of Transportation, 2002.

2. 2004 Florida Traffic Information CD, Prepared by Florida Department of Transportation, published in 2005.

3. Quality/Level of Service Handbook, Prepared by Florida Department of Transportation, 2009.

4. Gulf Coast Parkway Corridor Feasibility Study Report, prepared for Opportunity Florida, by ATKINS, October 2003.

5. Project Traffic Forecasting Handbook, Florida Department of Transportation, 2012.

6. 2011 Florida Traffic Information CD, Prepared by Florida Department of Transportation, published in 2012.

APPENDICES

APPENDIX A
ADDITIONAL TRAFFIC DATA
(In a separate “ZIP” file)

APPENDIX B
PLANNED DEVELOPMENT IN EASTERN BAY COUNTY AND GULF COUNTY

Planned Developments in Eastern Bay and Gulf Counties

Development	Type	Size	Location	Opening Year	Build-out Year
Pre-Development					
Bayview Estates	Residential	120 units	Gulf Co.	2007	2009
St. Joe Mill Site	Mixed Use	600 residential units 350,000 sq. ft. retail 150,00- sq. ft. office 150-bed hotel	US 98 in Port St. Joe – Old mill site	2007	TBD
Avenue A	Residential	96 units	Gulf County		
Waterford Village			CR 386		
Wetappo	Master Planned Community	481-acres		Breaking Ground	
Gulf Pines, LLC			CR 386		
WoodBrooke Cove			CR 386		
Buckhorn Ranch			CR 386		
Scarlett's Place		28 units on 10 acres	SR 22		
Kali Lakes	Residential	325-lot	SR 22 and CR 2297		
South Long Estate Phase II/Easy Waters	Residential	257 units	Overstreet		
Plantation Heights	Residential	18 lots	Plantation Dr. & Arbor Lane		
Wildwoode Traces	Residential	126 units	SR 22		
Rivercamp on Sandy Creek	Residential	600 units	South of SR 22	2007	2012
College Station	Residential	800 units	Bay County		
Boggy Creek	Residential	526 units	Bay County		
Deer Point Plantation Phase 1	Residential	67 Units	Resota Beach Rd.	Order Issued	
Magnolia Springs	Mixed Use	950-acre site School, public safety, town center, residences	Lynn Haven		
Allanton Harbor	Master Planned Community	900 residential units 68 slip marina commercial			
Active					
Bayou Creek Plantation	Residential	9 units	John Pitts Road	Development Order Issued	
Bonfire Beach	Mixed Use	750 residential units, 70,000 sq. ft. commercial	US 98		
Garrison Plantation	Residential	52 units	Port St. Joe		
WindMark Beach	Mixed Used	1662 units	US 98	2006	
River Camp on Crooked Creek	Residential	450 units	Western Bay County	Selling	
The Hammocks	Residential	457 units	Bay County		2006
Hawks Landing	Residential	168 units	Lynn Haven	Order issued	
Bridgeport	Residential	37 units		2005	2005
Sunset Village – Phase III	Residential	89 homesites on 40 acres	US 98 between St. Joe Beach and	Selling	

			WindMark		
Barefoot Cottages	Residential	140 cottages on 18 acres	South of WindMark	Selling	
Cottages At Coastal Pines	Residential	42 lots	CR 386	Selling	
Beacon By the Sea	Residential			Selling	
Heron Walk	Residential	53 sites	Port St. Joe	Selling	
Waterside Village Cottages	Residential	19 units	Mexico Beach	Selling	
Magnolia Reserve	Residential	24 lots	Jarrott Daniels Road and Wetappo Creek	Selling	
East Bay Plantation	Residential	176 units in Phase 1 19 in Phase 2	On East Bay and Wetappo Creek	Order Issued	All lots under contract
East Bay Preserve Phase 1 (1300 acres)	Residential	75-lots	Hauser Road	Order Issued	
East Bay Village Subdivision	Residential	6 lots	Allanton Road	Order Issued	
Laird Point (200 acres)	Residential	Phase 1 will have 167 units	Polecat Bayou Road	Order Issued	
Landings at Wetappo Creek	Residential	16 lots on 114 acres	CR 386	2005	2008
Park Place	Residential	257 units	SR 22 Callaway	Permitting	
Sanctuary at Bayou Village	Residential	122 units	SR 22 Callaway	Permitting	
Cedar Crossing	Residential	200+	Everitt Avenue Cedar Grove	Order Issued	
Cedar Creek @ Deerpoint Lake	Residential	60 units	Resota Beach Rd.	Order Issued	
Cherokee Heights	Residential	Phase IV has 200+ units	US 231 Cedar Grove	Order Issued	
Riverside	Residential	Phase 2 will have 200+ Units	US 231 in Cedar Grove	Order Issued	
Lake Merial	Mixed Use	School,fire/police station, 200 acres commercial, 1250 acres residential		Permitting Phase 1 166 units	
Deerfield Estates	Residential	20 units	Frank Hough Road west of Star Avenue	Permitting	
Plantation Park	Residential	40-lots	Transmitter Road between US 231 and CR 390		
Bay Colors	Residential	15 lots	Simmons Bayou	Selling	
Fox Trace	Residential	32 Townhomes	Mary Ella off SR 22		
Emerald Coast Yacht Club	Residential	11 units	South of Hiawatha St. & west of Star Ave.	Order Issued	
Grant’s Mill	Residential	38 lots in Phase 2	Mill Bayou and CR 390	Order Issued	
Greenwood Village	Residential	38 lots	Pinetree Road north of John Pitts Road	Order Issued	
Nelle Townhomes	Residential	68 units	Nelle St. south of SR 22	Order Issued	
Plantation Park	Residential	40 units	Between 231 & 390	Order Issued	

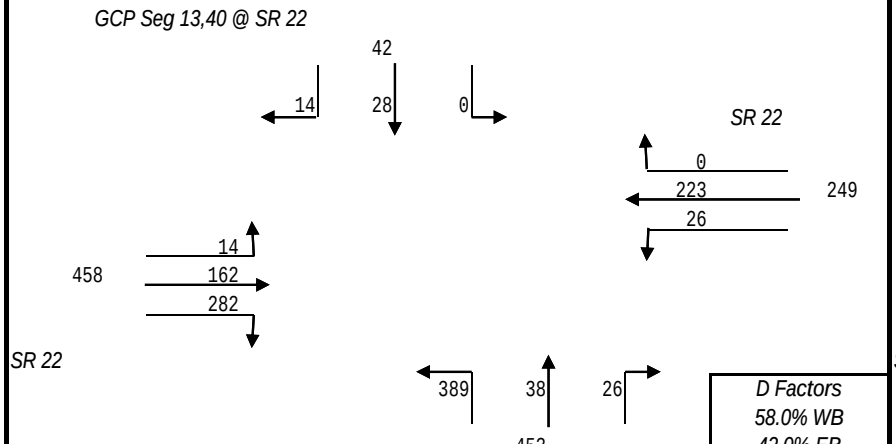
Wells Landing Phase I	Residential	36 units	Resota Beach Road/south of Harry Wells Road	Order Issued	
Wells Landing Phase 2	Residential	47 units	Resota Beach Road/south of Harry Wells Road	Order Issued	
Wildwood Court	Residential	19 lots	Comet Ave. south of SR 22	Order Issued	
Condominiums					
Gulf Breeze Villas	Residential	18 units	Mexico Beach	Selling	
The Club at Mexico Beach	Residential	48 units	Mexico Beach	9/2006	
Tranquil Harbor	Residential	35 units	Mexico Beach	Selling	
Waterside Village Condos	Residential	51 units	Mexico Beach	Selling	
West End Harbor	Residential	49 units & 7000 sq. ft. commercial	Mexico Beach		
Paradise Shores	Residential		Mexico Beach	Under construction in 2006	
Commercial/Industrial					
Galleria at Callaway	Mixed use master planned community	500,000 sq. ft. with 350,000 sq. ft. retail and 150,000 sq. ft. office. Unknown residential	Tyndall Parkway north of SR 22 across from Super WalMart		
Port Authority Intermodal Distribution Center	Industrial	240 acres will be developed	US 231		
Warehouse		28,200 Square feet.	US 98 & Gulf County Canal		
Douglas Dykes Business Center	Commercial	5000 Sq. ft. building	Berthe Ave. & SR 22		
E. F. San Juan		5600 Sq. Ft. Warehouse Expansion	10916 US 231	Order Issued	
E. F. San Juan		11,021 Sq. Ft. Warehouse Expansion	10916 US 231	Order Issued	
E. F. San Juan		8000 Sq. Ft. Addition	10916 US 231	Order Issued	
HWY 231 Storage Buildings		58,347 sq.ft.	US 231 & Davenport	Order Issued	
Marina Cove	Commercial	41 lots		Selling	
Cedar Grove Commerce Park	Commercial	51 acres			
Port St. Joe Commerce Park Phase 2	Industrial	45 acres, 29 lots, 6 for sale			
Port of Port St. Joe	Industrial			Unknown	
Speculative					
Unnamed	Residential	Low Density on 143.54 acres	SR 22		
Highway 22	Residential	656 acres by SJC I unit/2.5 acres	SR 22		
Mosley Drive	Residential	40 acres by SJC	Lynn Haven		

Transmitter Road		30 acres by SJC	Lynn Haven		

APPENDIX C
ADDITIONAL DDHV CALCULATIONS

PROJECT TRAFFIC FOR SR 22 AT GCP Seg 13,40 @ SR 22: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



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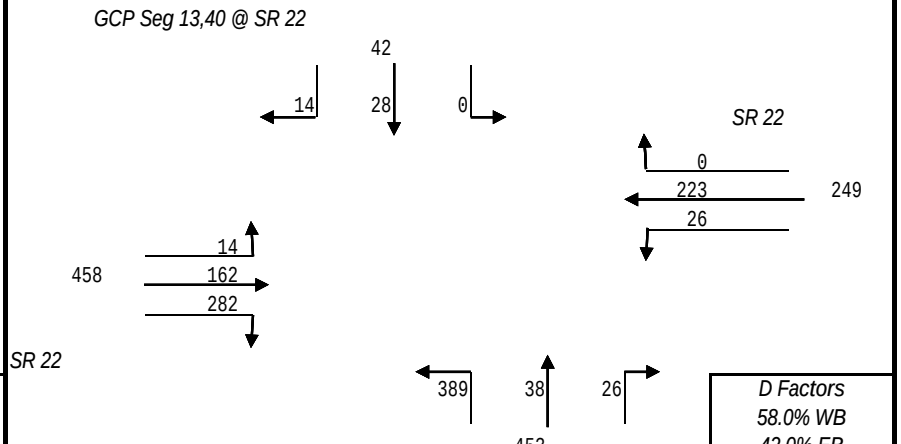

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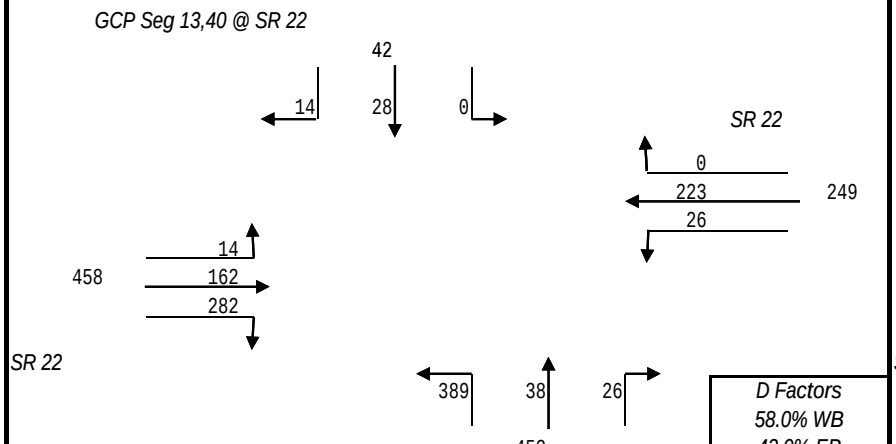

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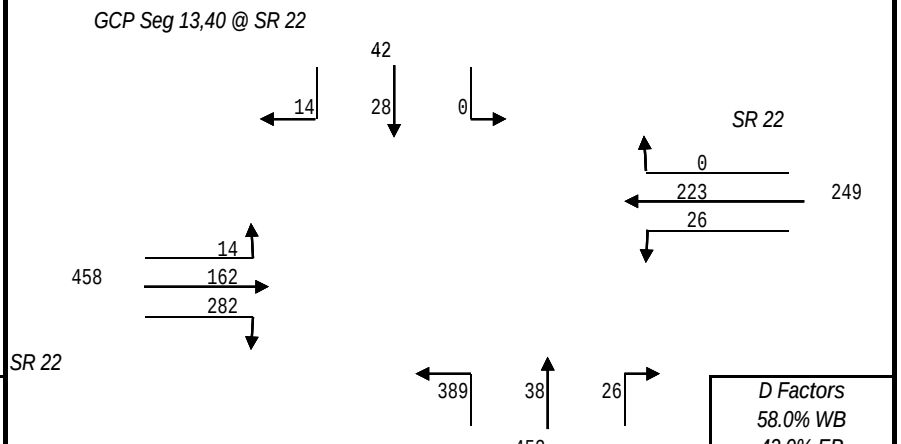

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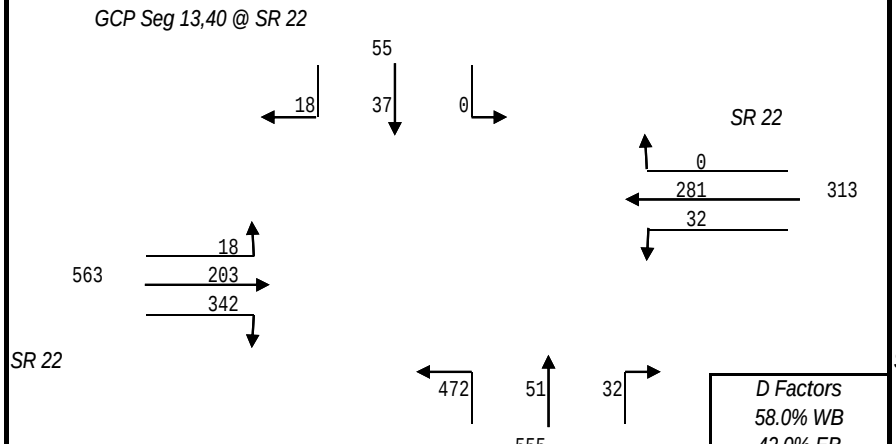

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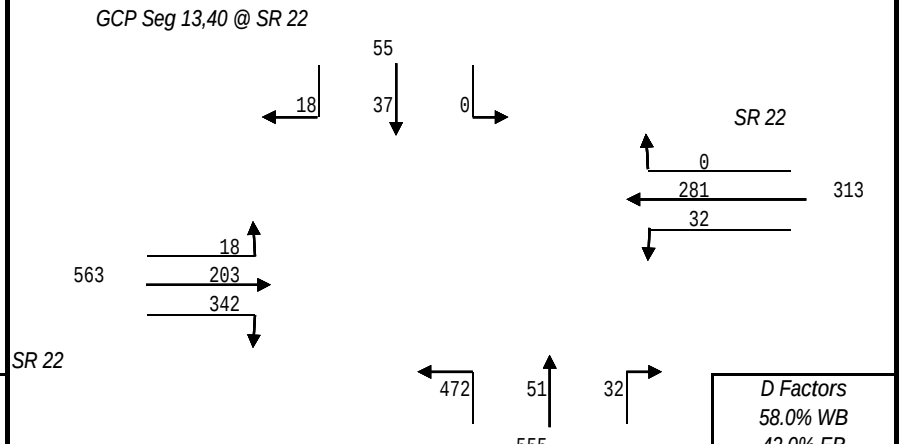

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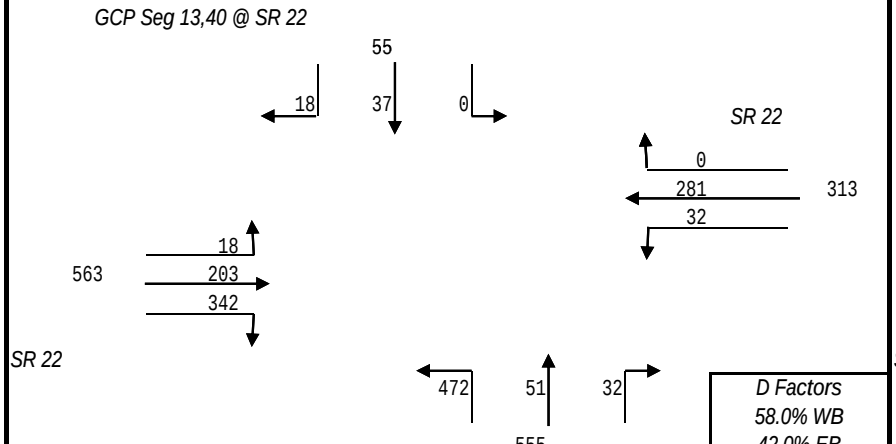

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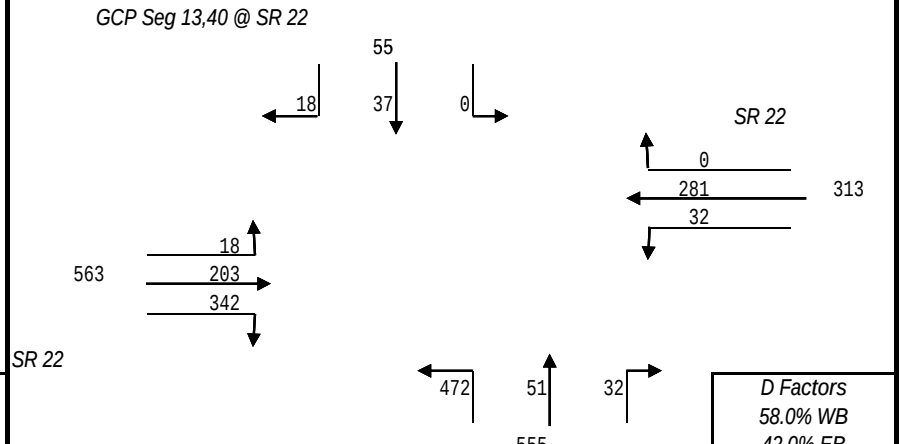

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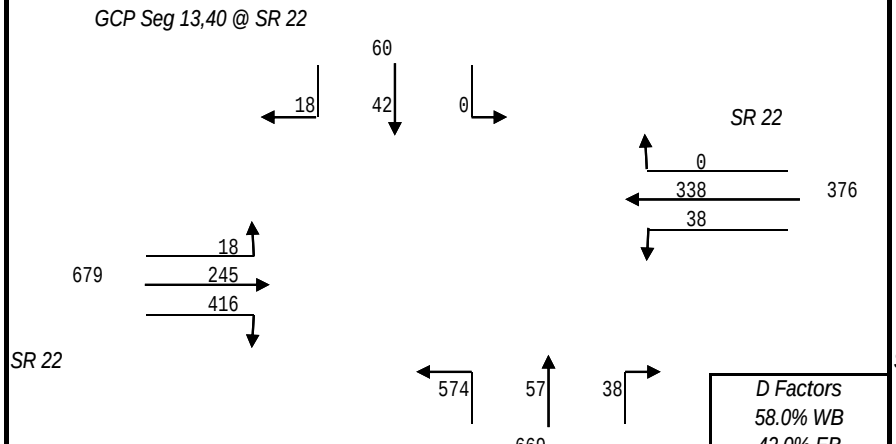

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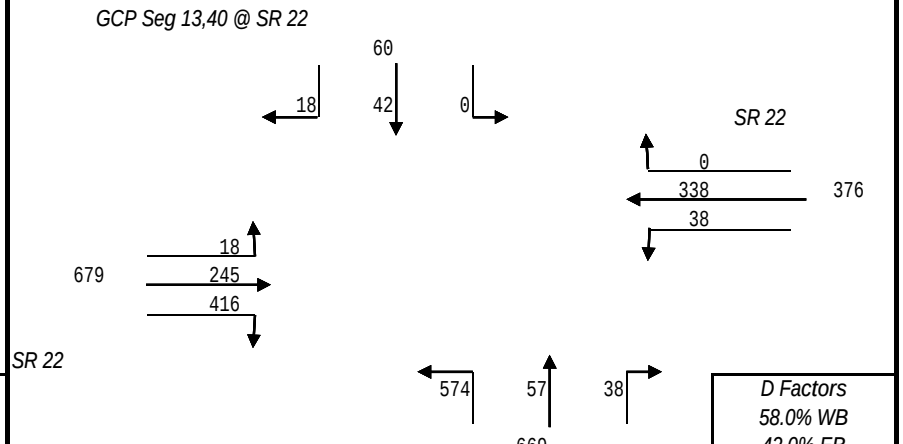

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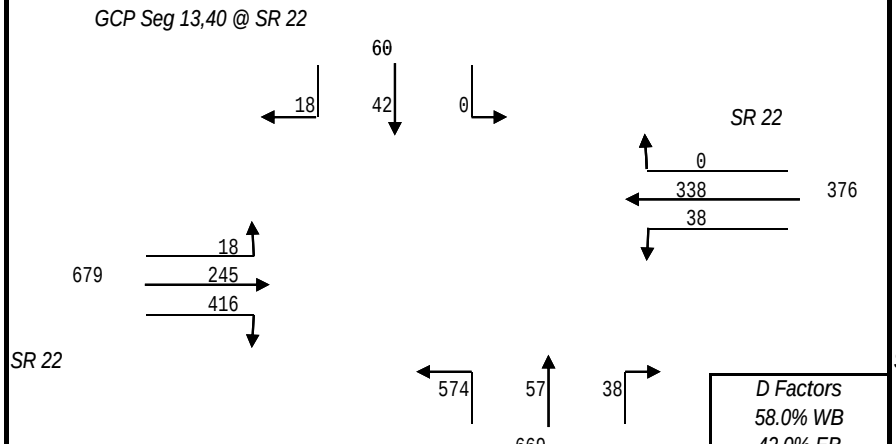

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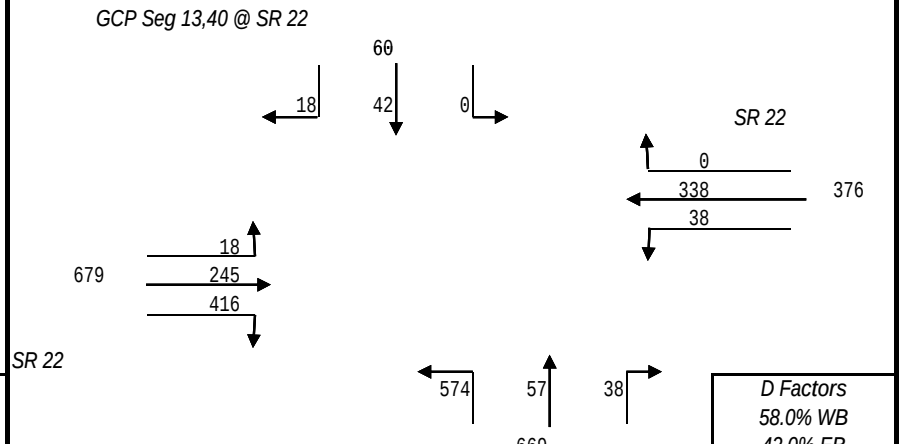

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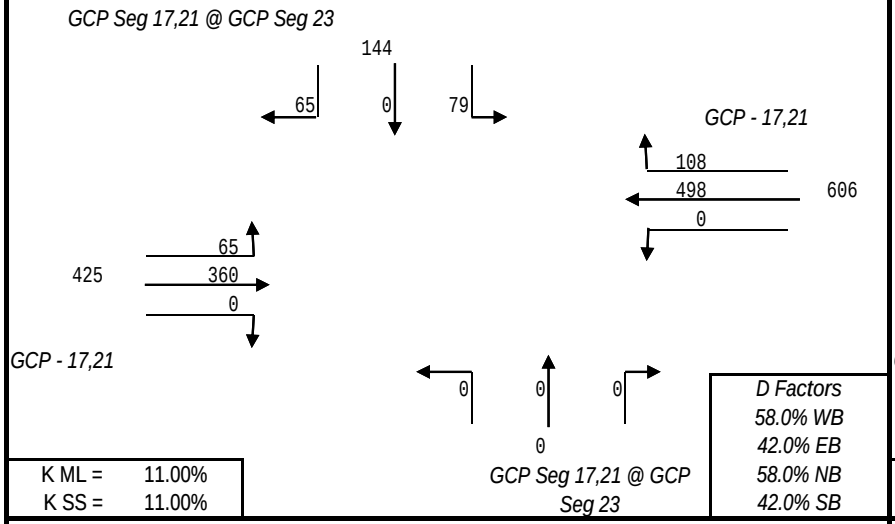
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



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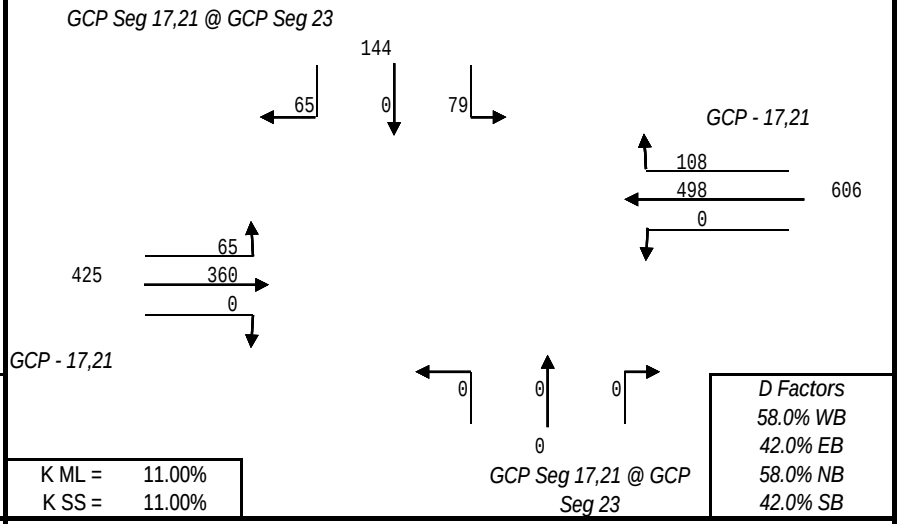

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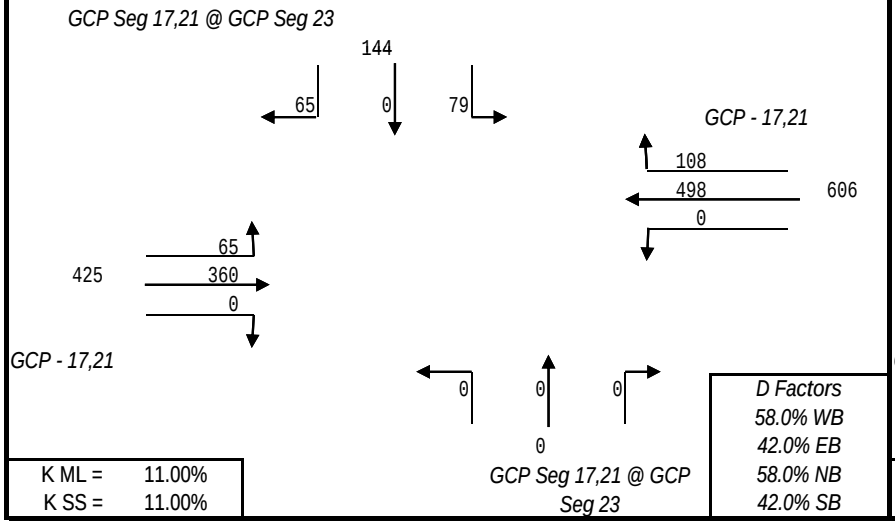

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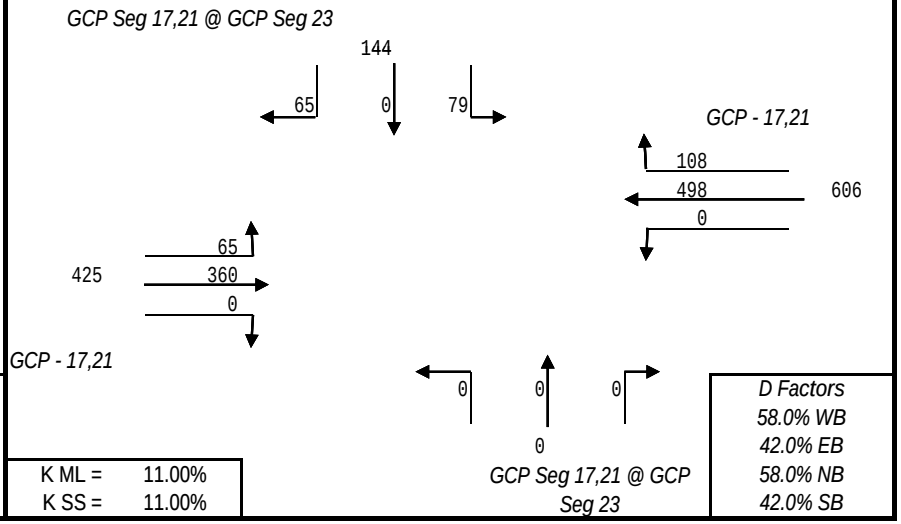

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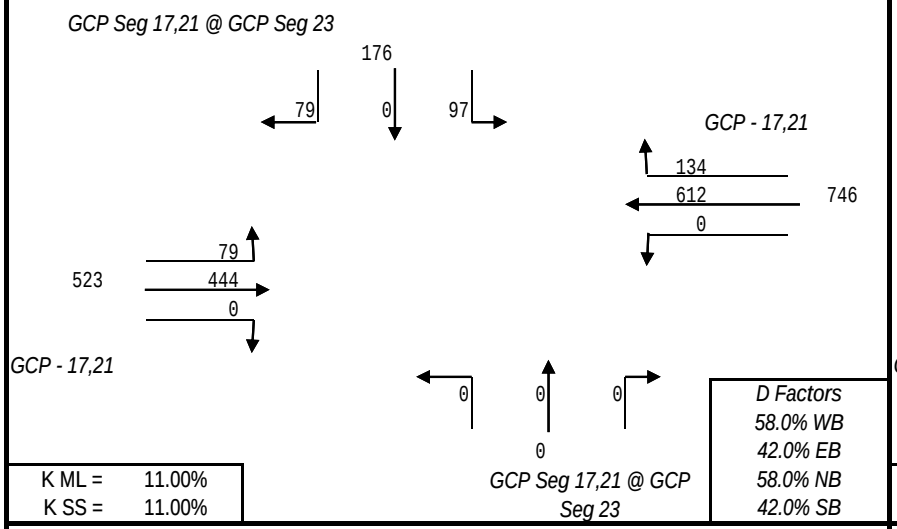
PROJECT TRAFFIC FOR GCP - 17,21 AT GCP Seg 17,21 @ GCP Seg 23: TO

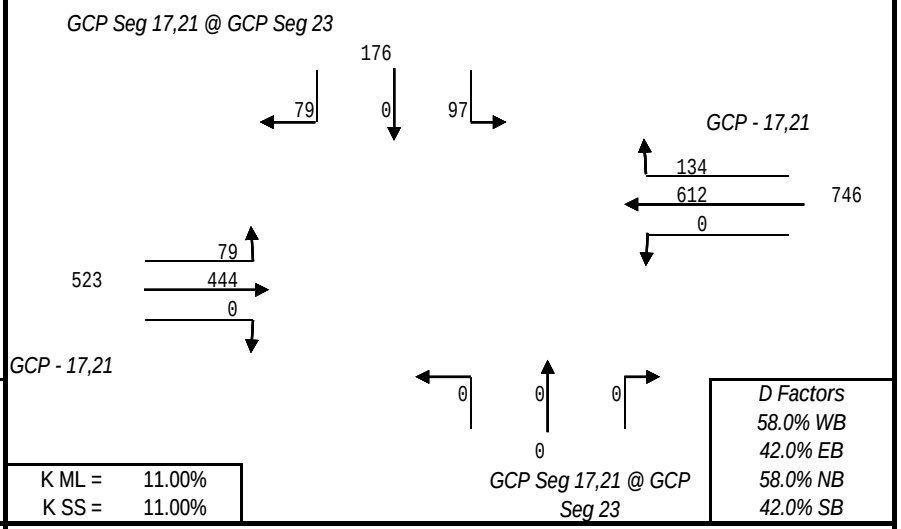
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

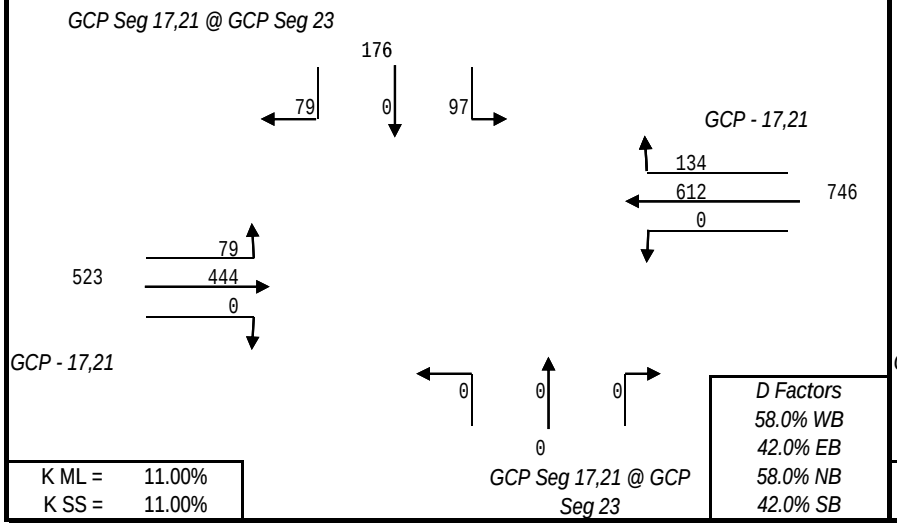
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

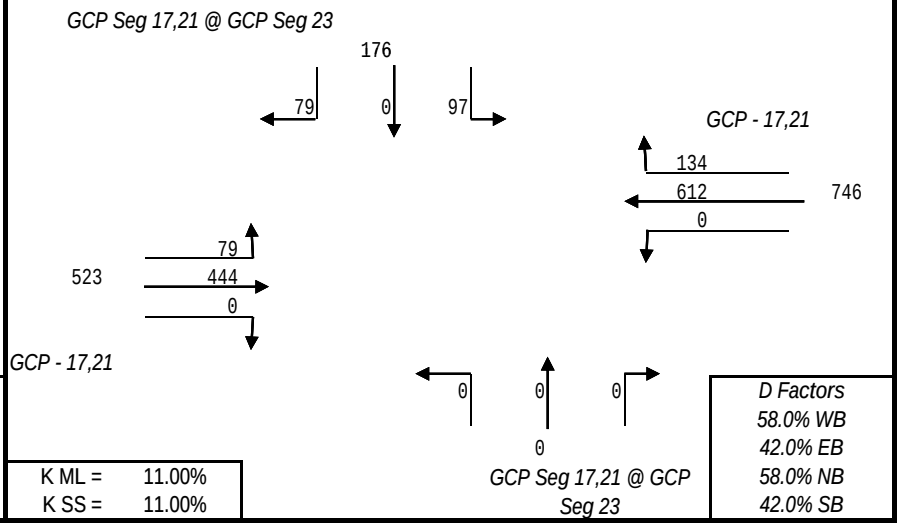
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

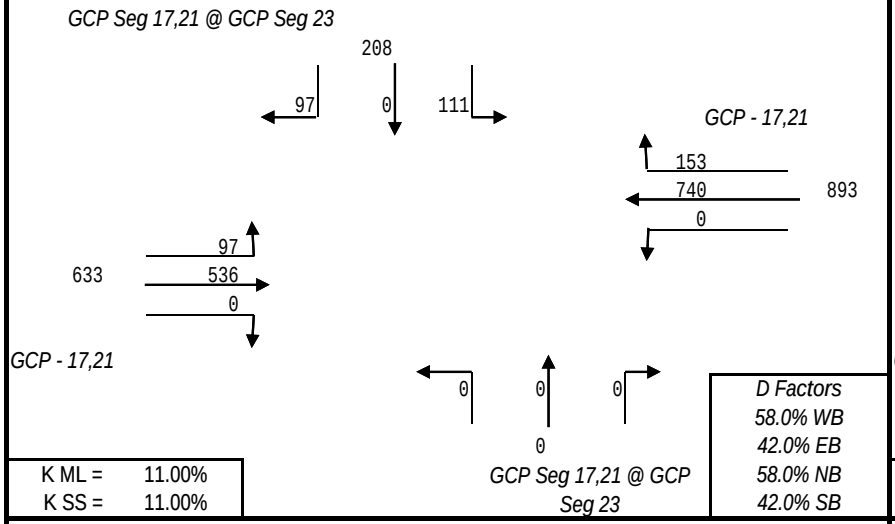


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR GCP - 17,21 AT GCP Seg 17,21 @ GCP Seg 23: TO

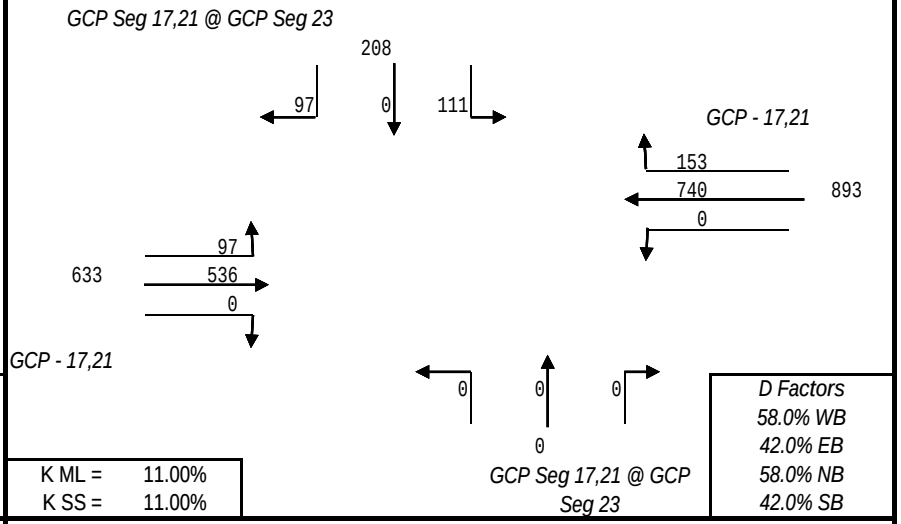
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

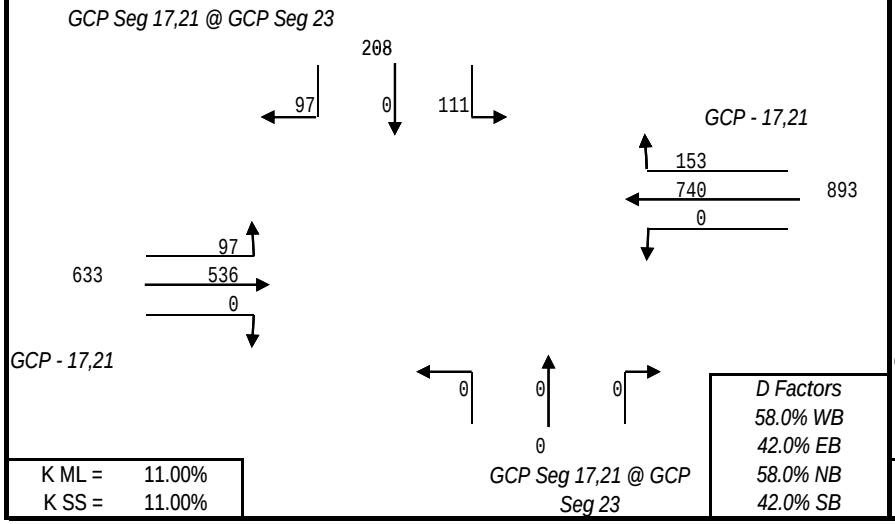
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

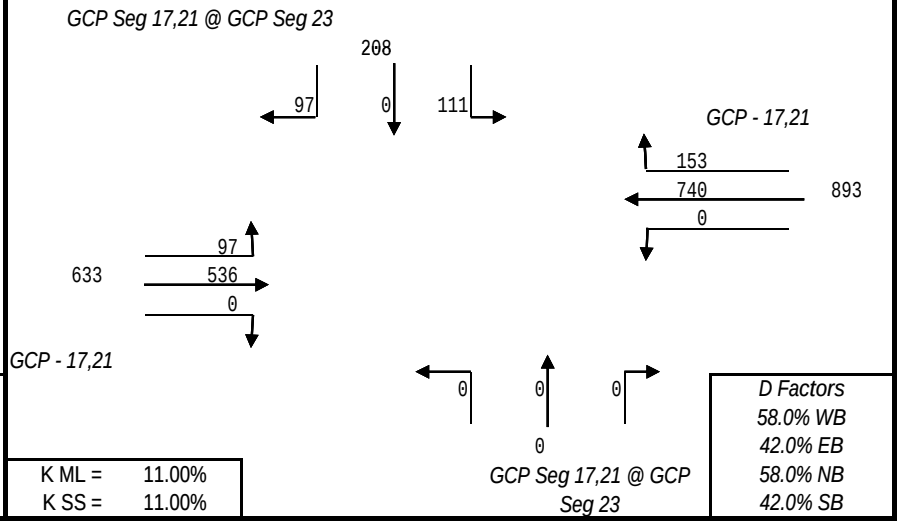
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

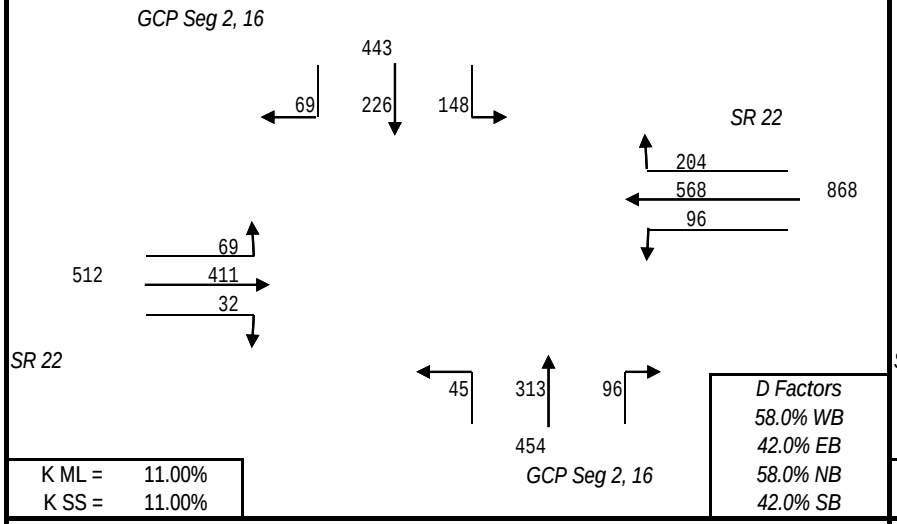


K ML =	11.00%
K SS =	11.00%

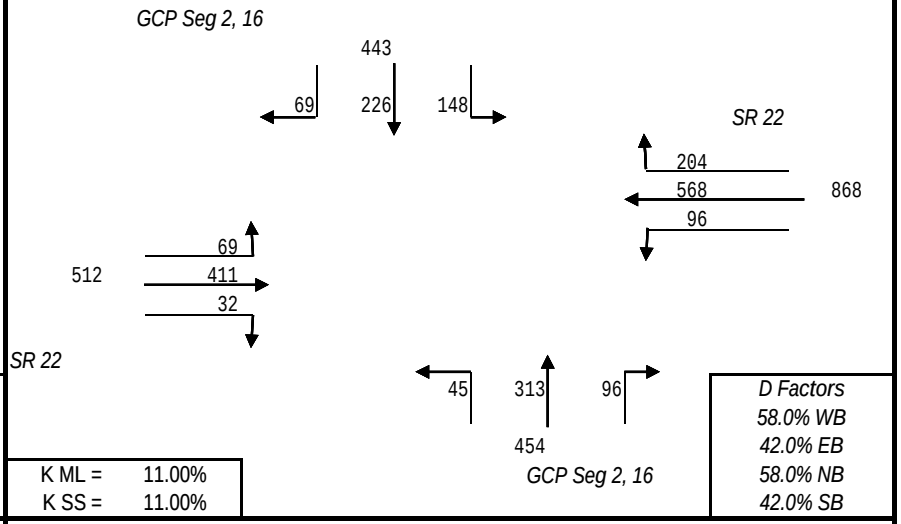
D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR SR 22 AT GCP Seg 2, 16: TO

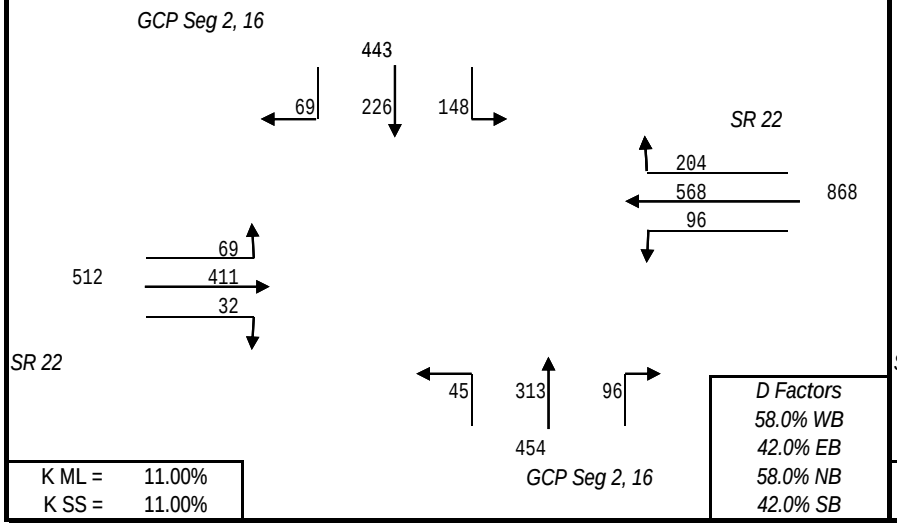
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



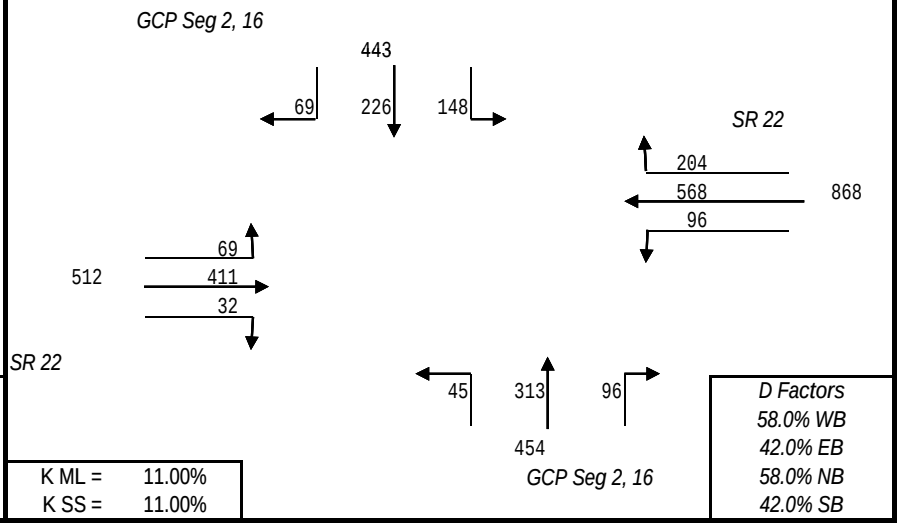
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022

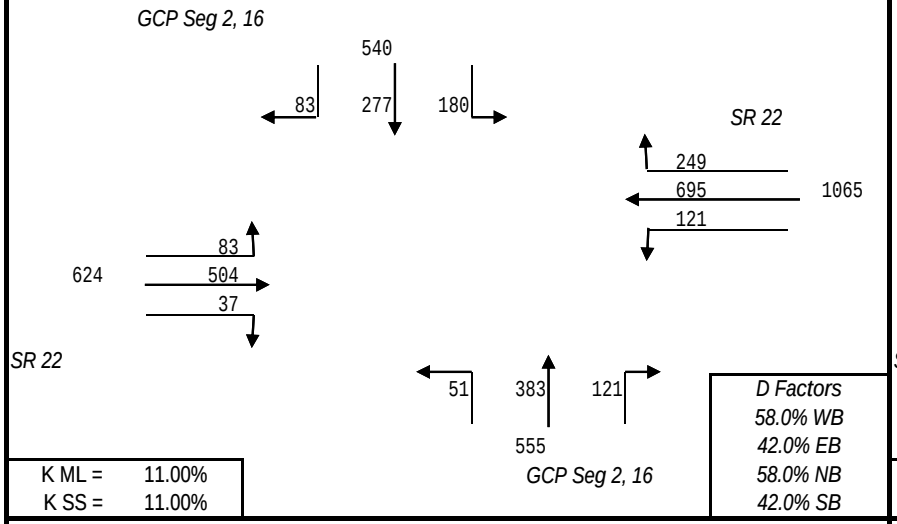


1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

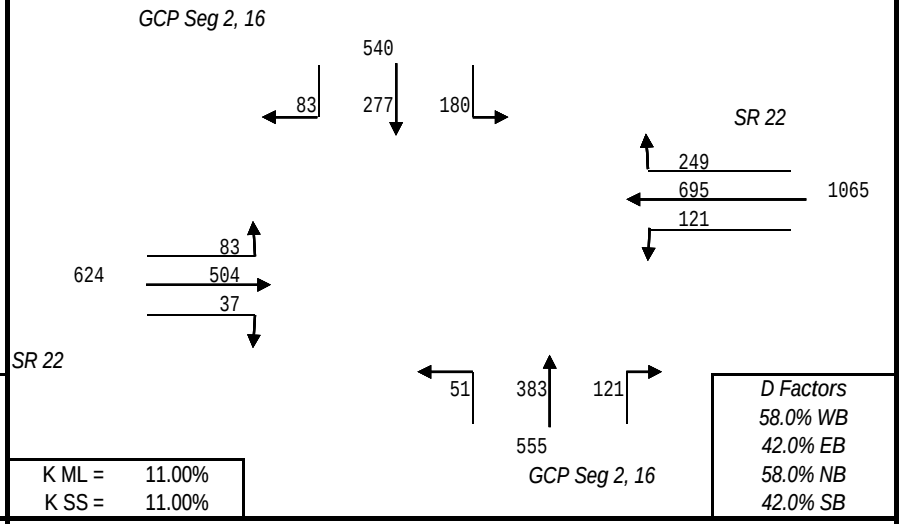


PROJECT TRAFFIC FOR SR 22 AT GCP Seg 2, 16: TO

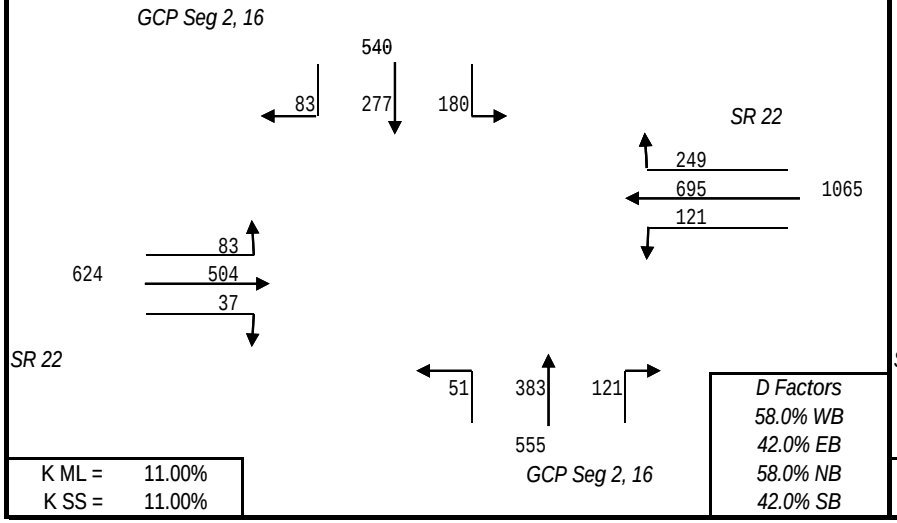
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



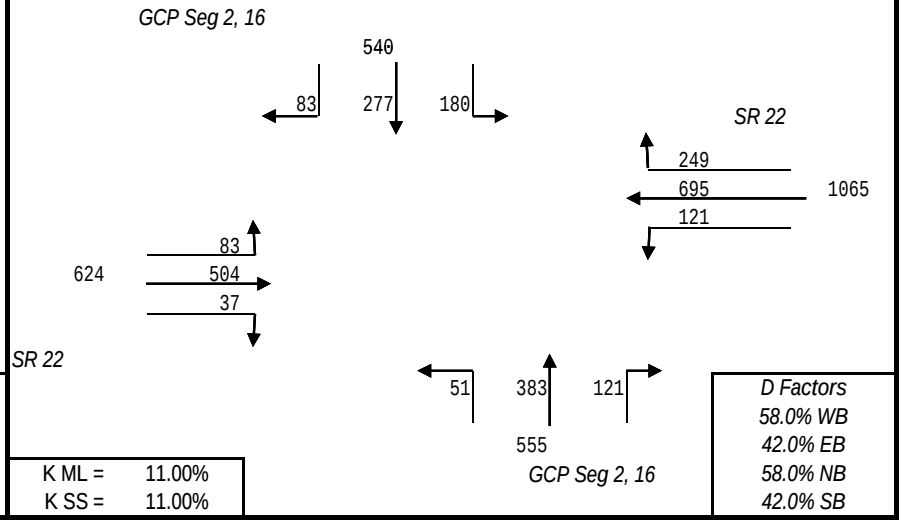
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022

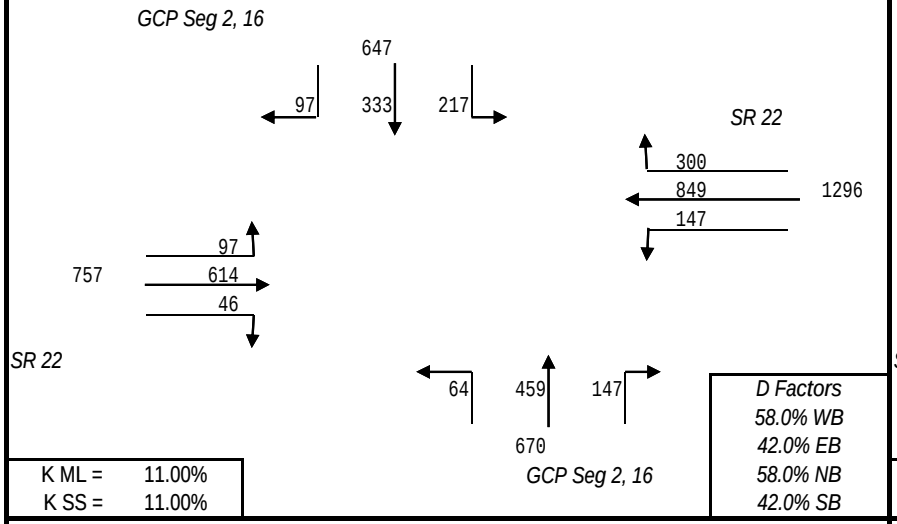


1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



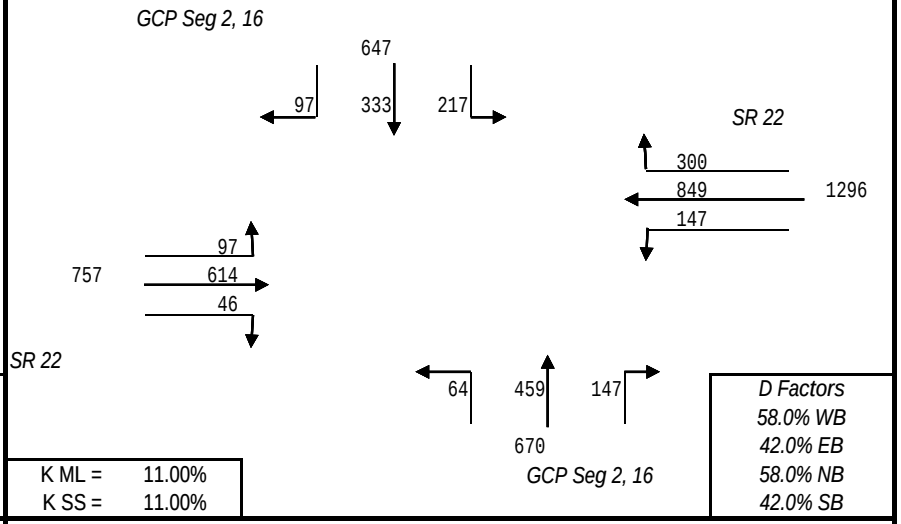
PROJECT TRAFFIC FOR SR 22 AT GCP Seg 2, 16: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



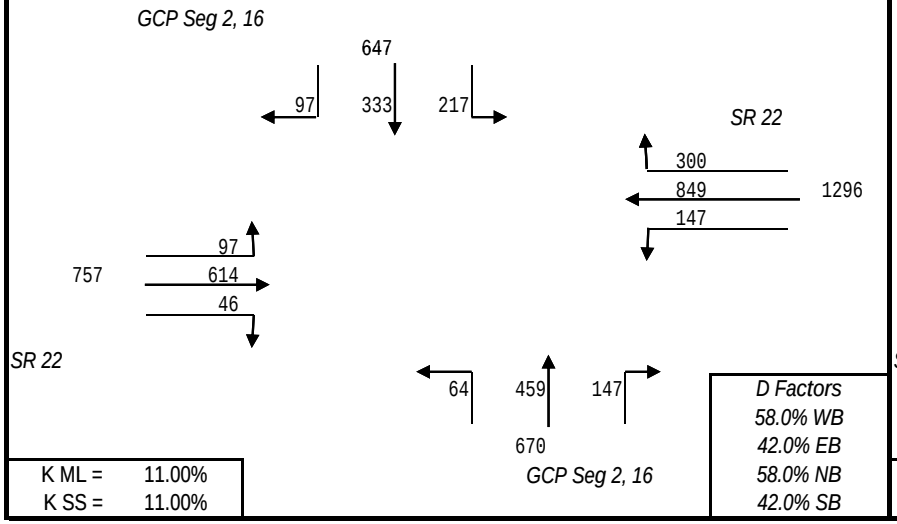
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



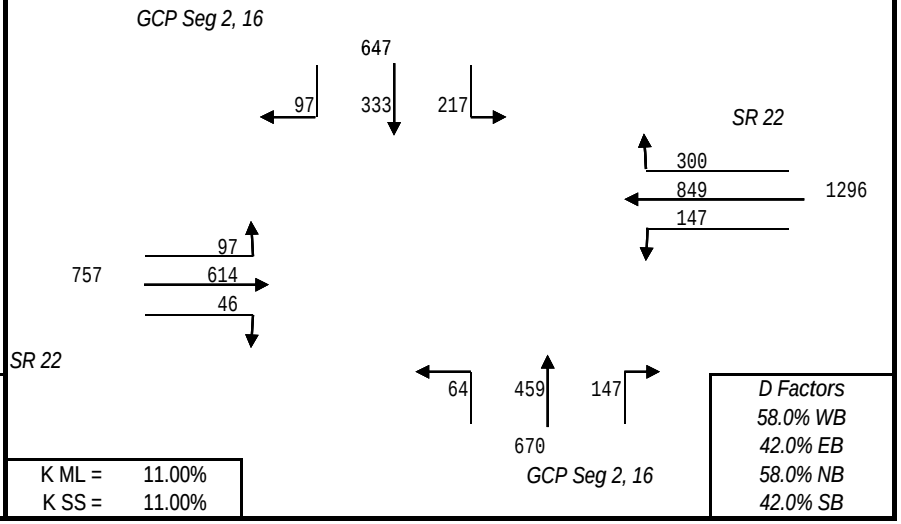
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML = 11.00%
K SS = 11.00%

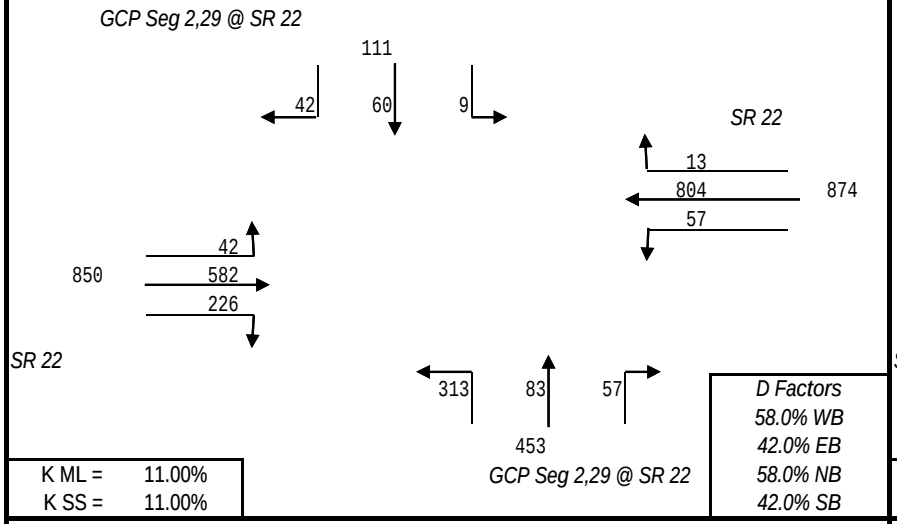
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML = 11.00%
K SS = 11.00%

PROJECT TRAFFIC FOR SR 22 AT GCP Seg 2,29 @ SR 22: TO

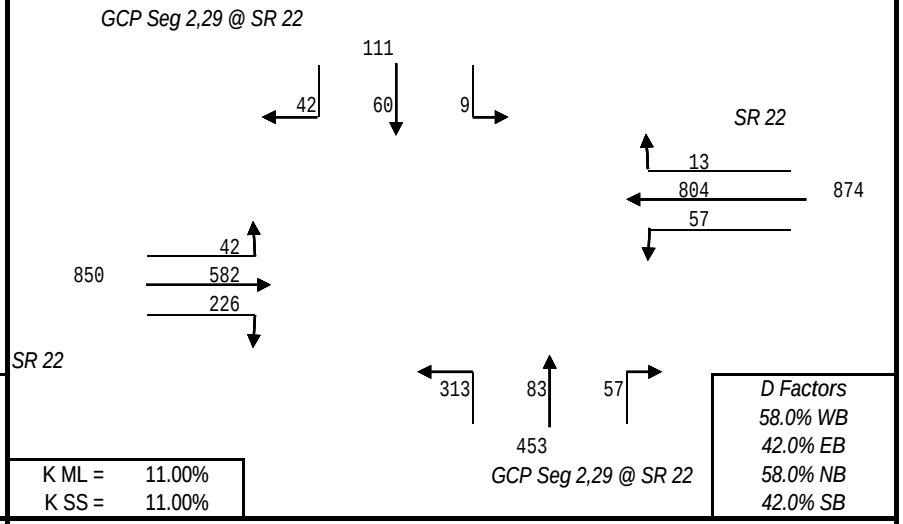
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

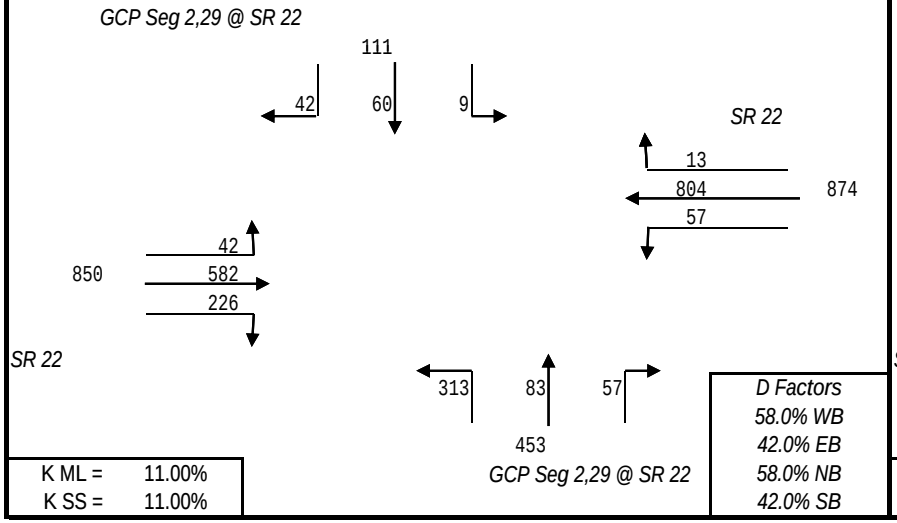
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

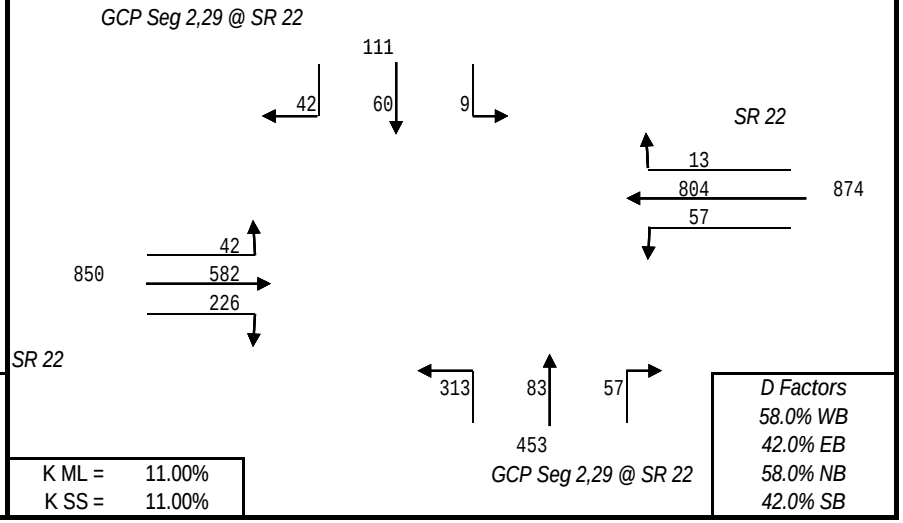
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

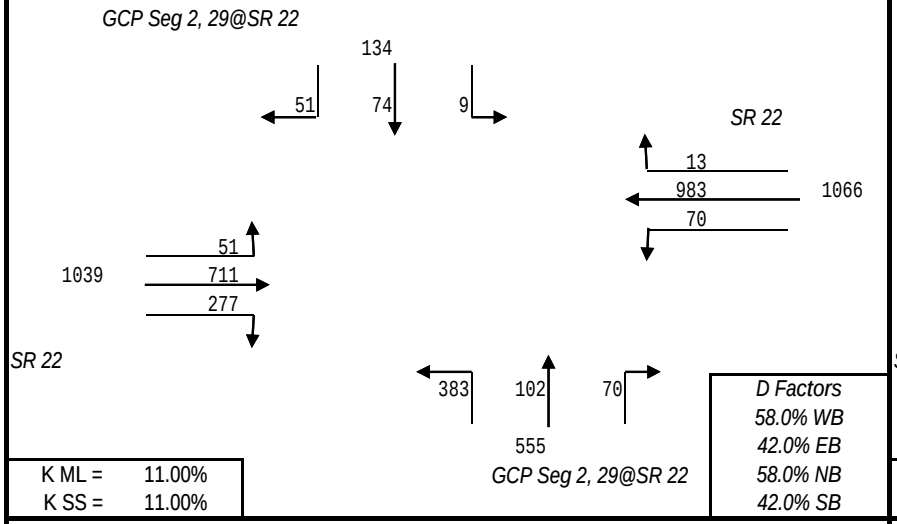


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

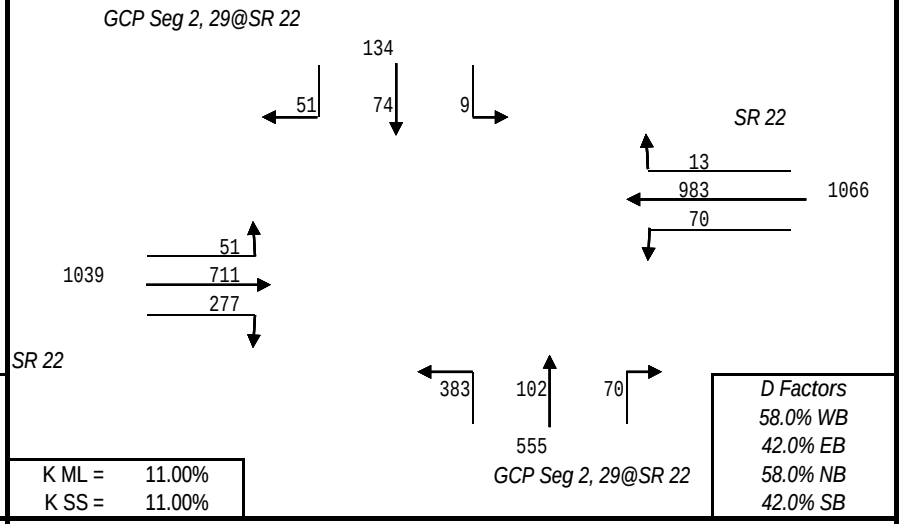
PROJECT TRAFFIC FOR SR 22 AT GCP Seg 2, 29@SR 22: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



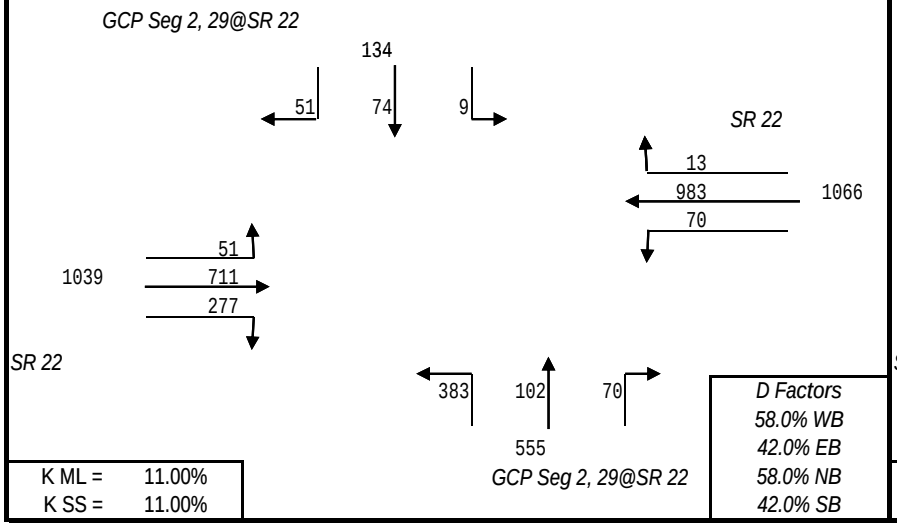
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



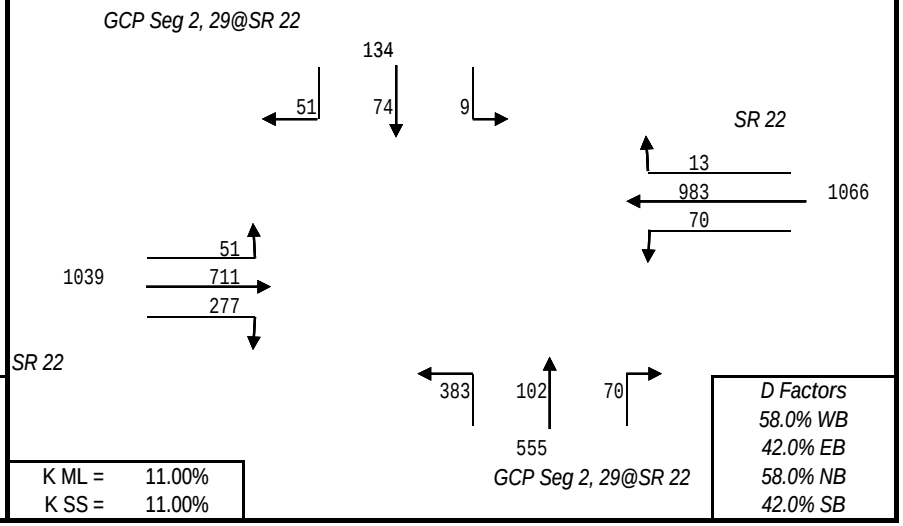
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML = 11.00%
K SS = 11.00%

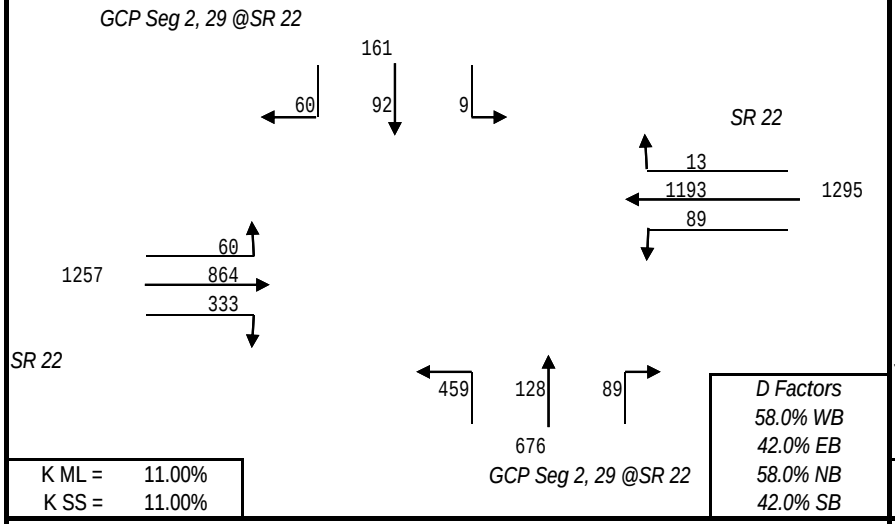
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML = 11.00%
K SS = 11.00%

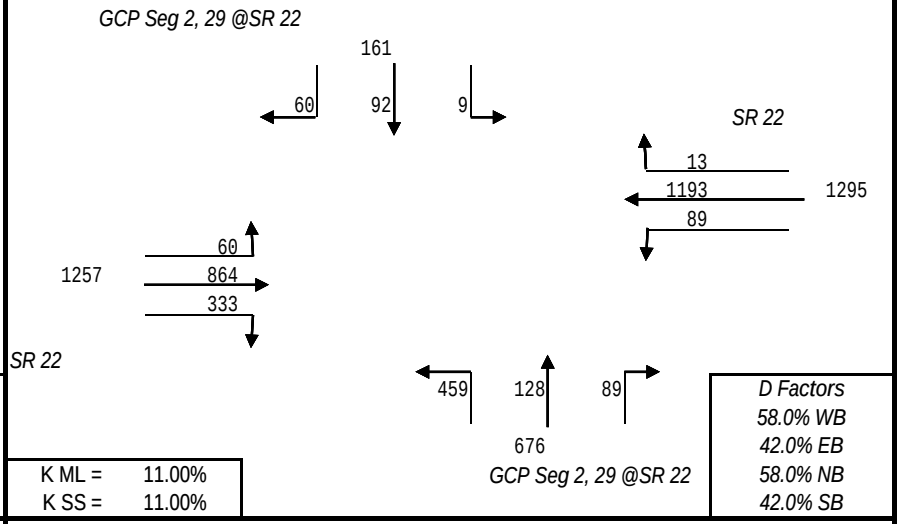
PROJECT TRAFFIC FOR SR 22 AT GCP Seg 2, 29 @SR 22: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



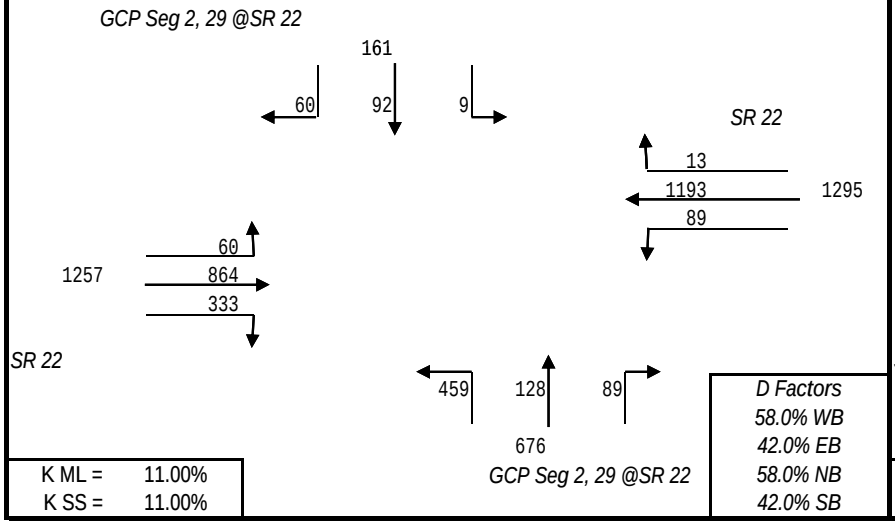
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



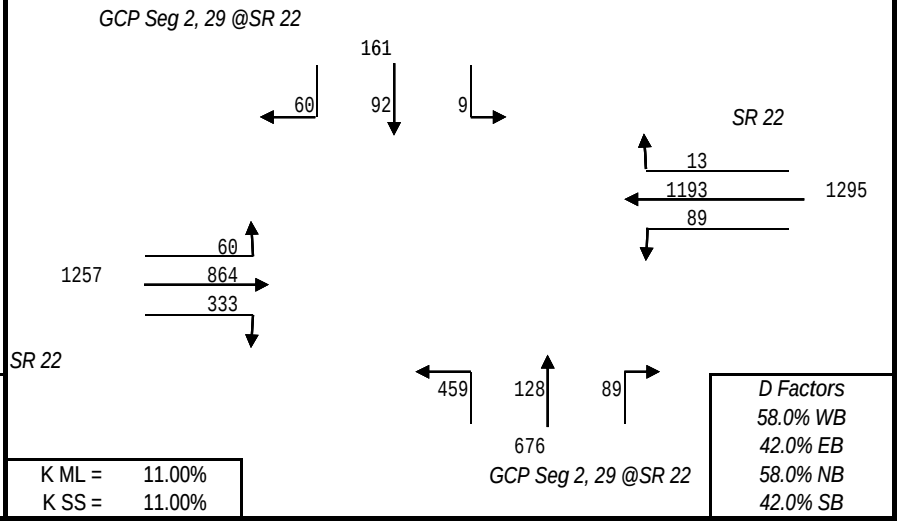
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML = 11.00%
K SS = 11.00%

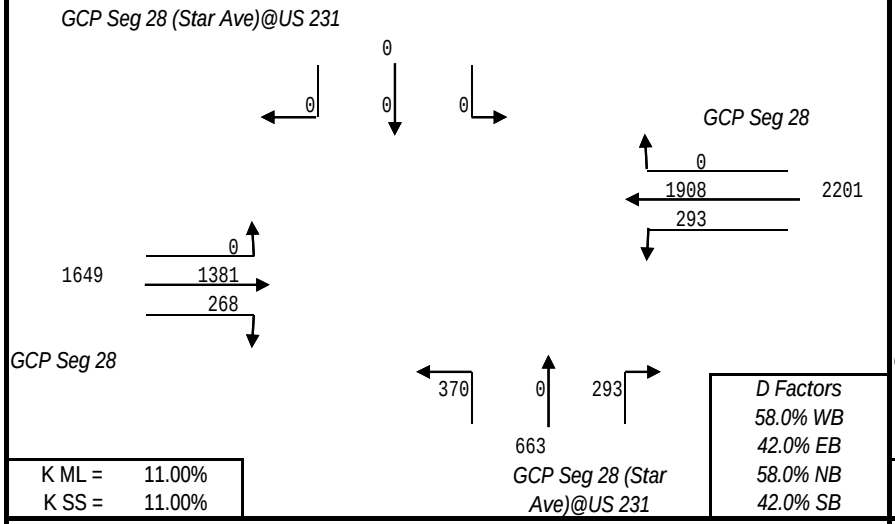
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML = 11.00%
K SS = 11.00%

PROJECT TRAFFIC FOR GCP Seg 28 AT GCP Seg 28 (Star Ave)@US 231: TO

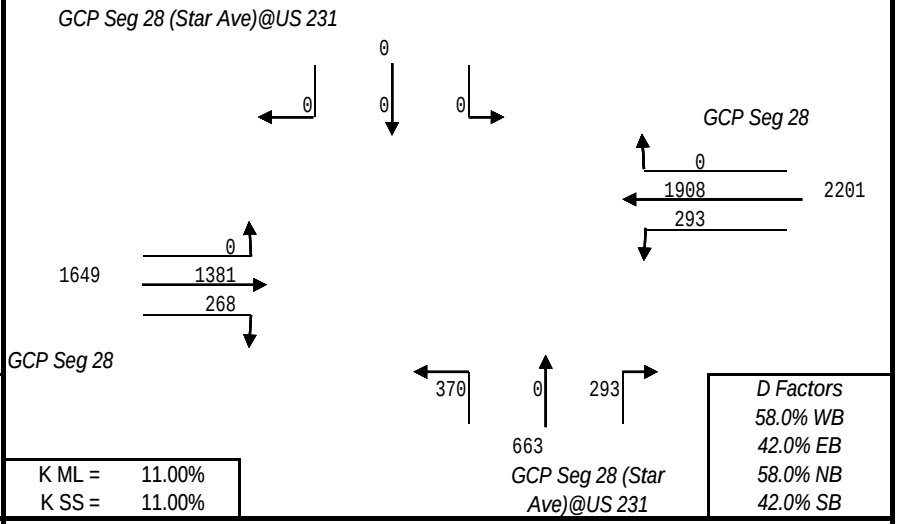
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

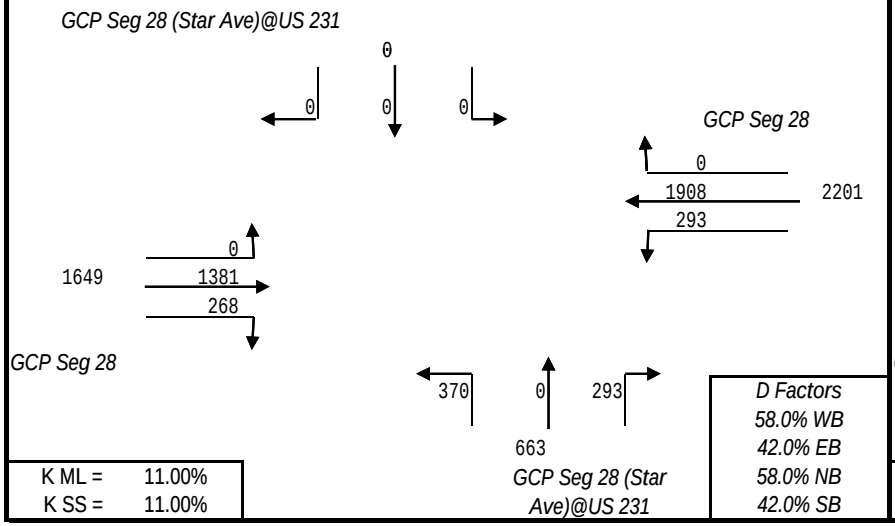
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

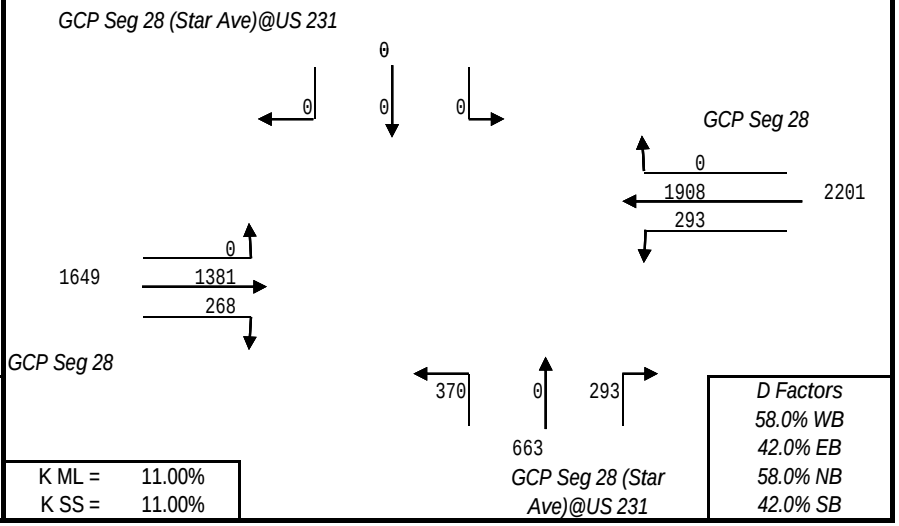
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

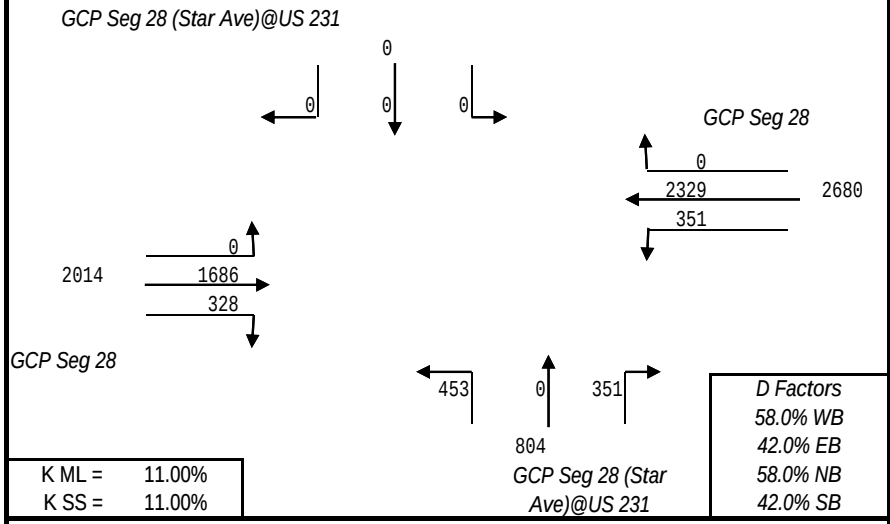


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR GCP Seg 28 AT GCP Seg 28 (Star Ave)@US 231: TO

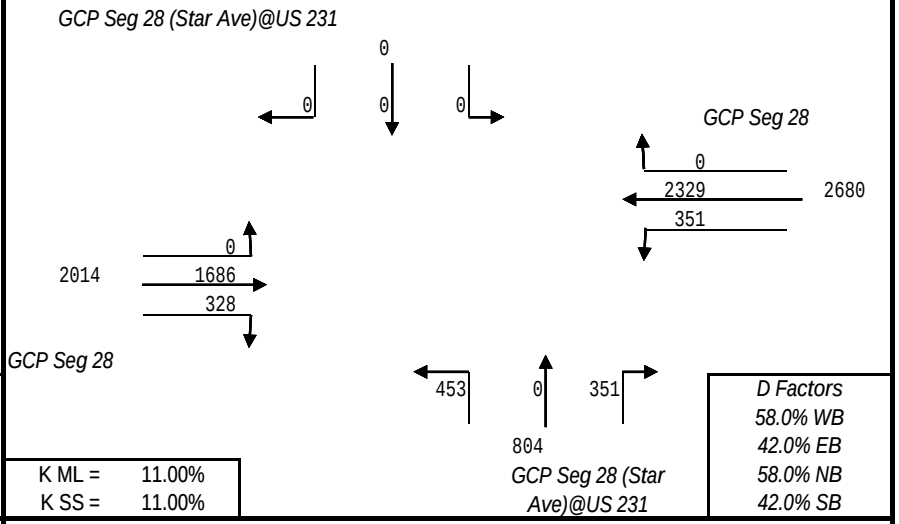
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

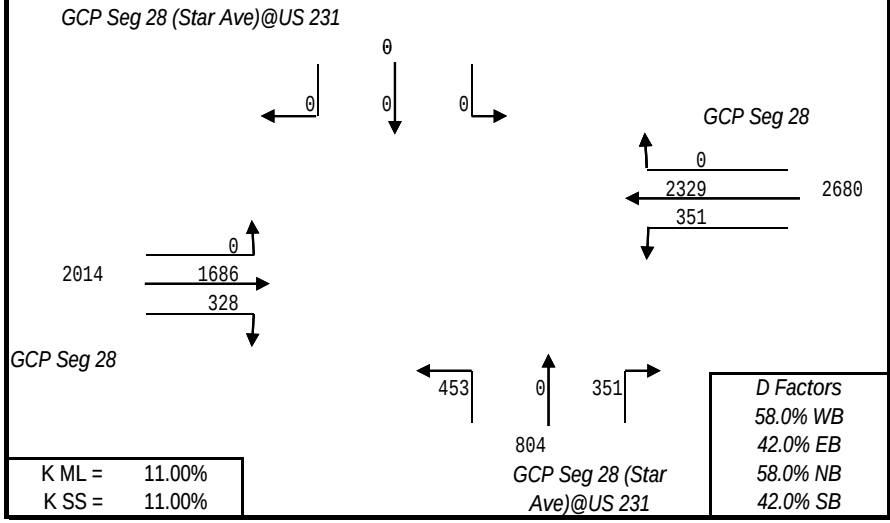
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

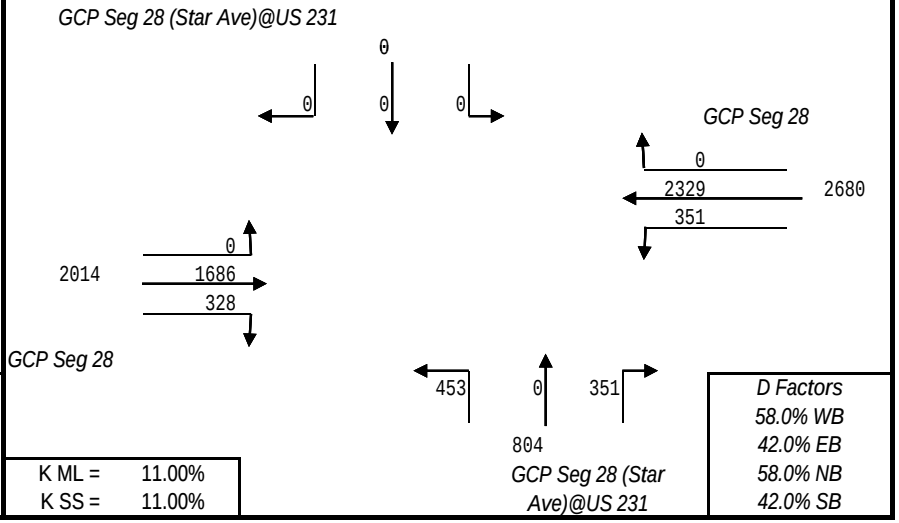
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

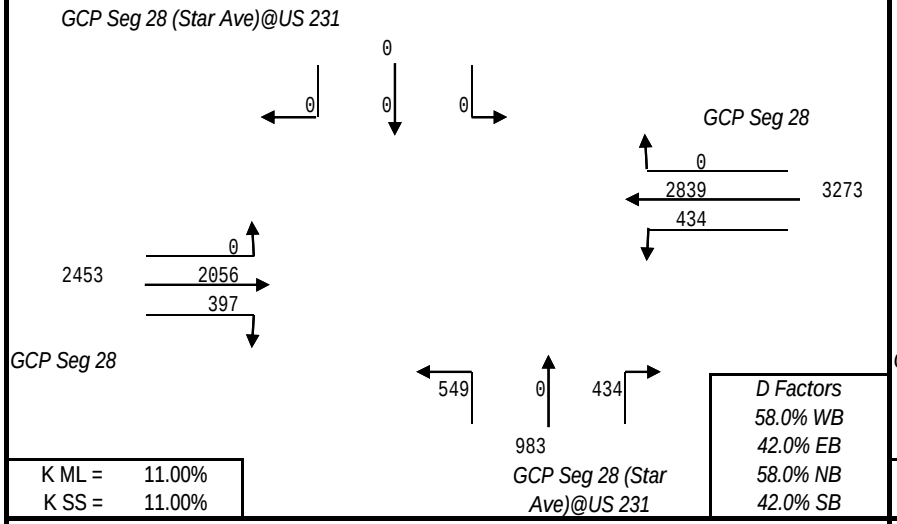


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR GCP Seg 28 AT GCP Seg 28 (Star Ave)@US 231: TO

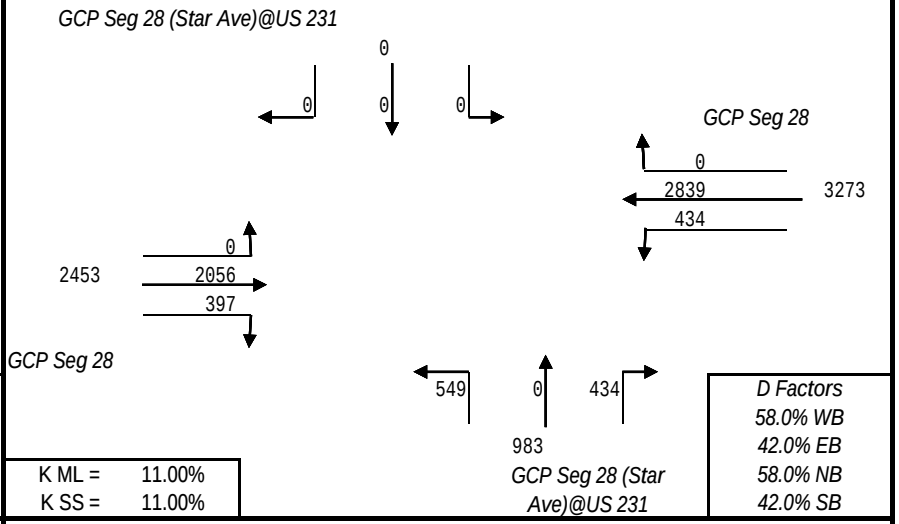
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

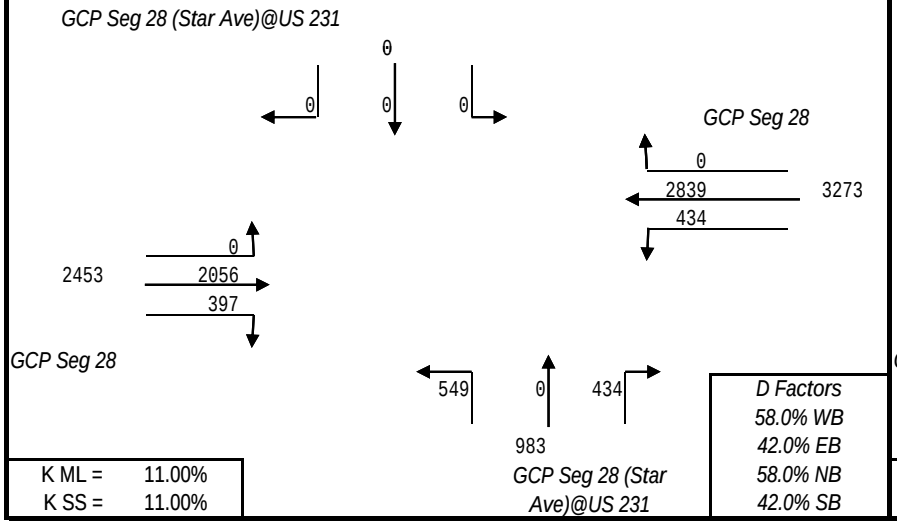
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

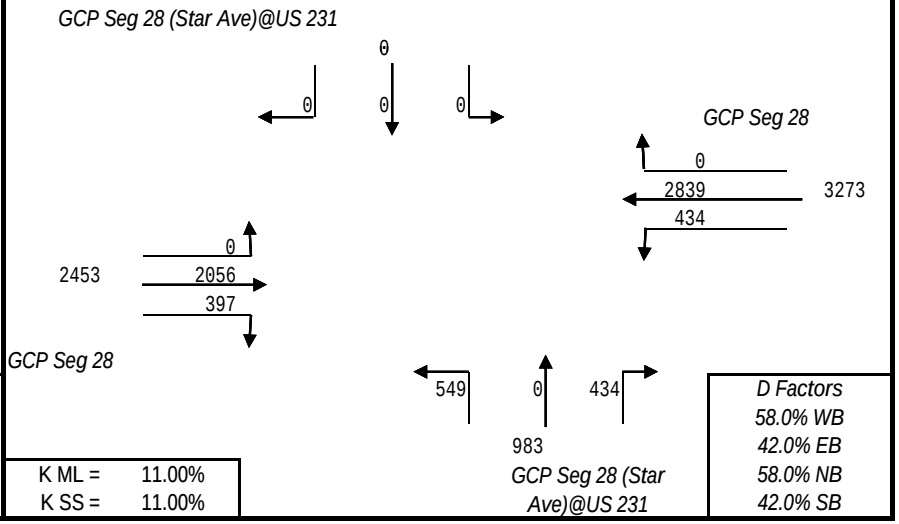
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

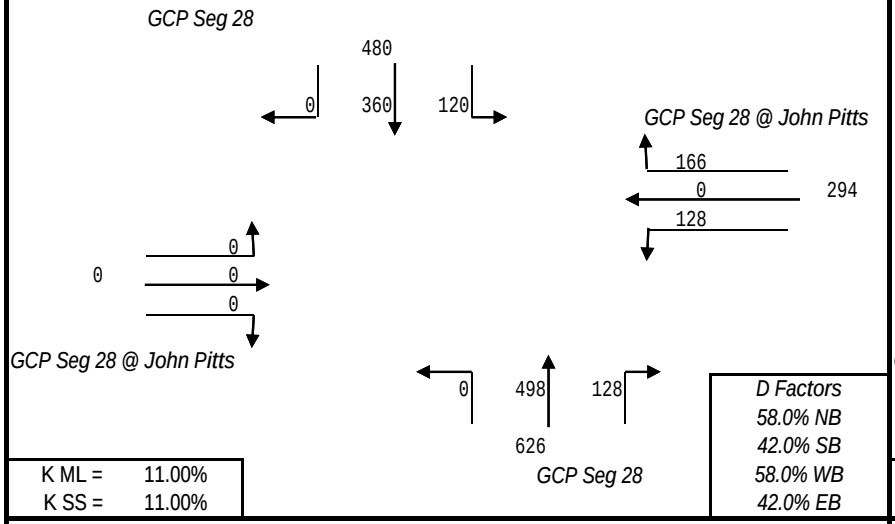


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR GCP Seg 28 AT GCP Seg 28 @ John Pitts: TO

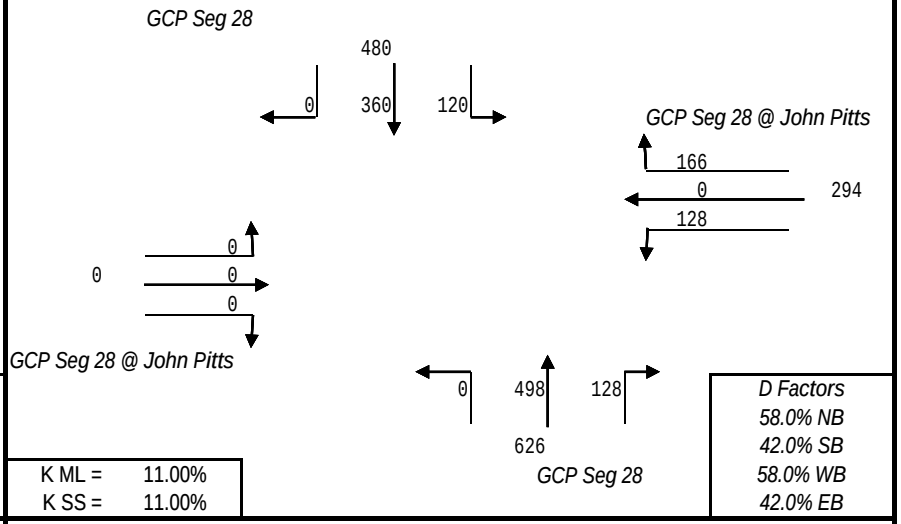
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

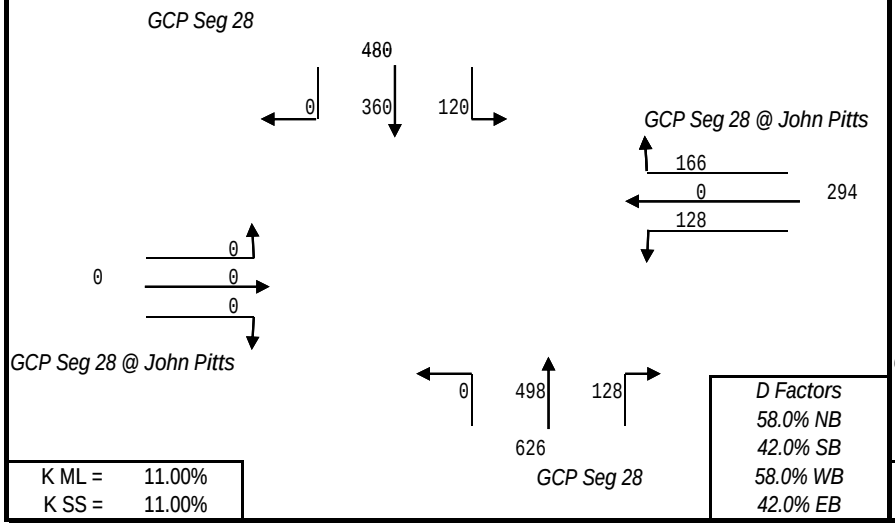
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2016



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

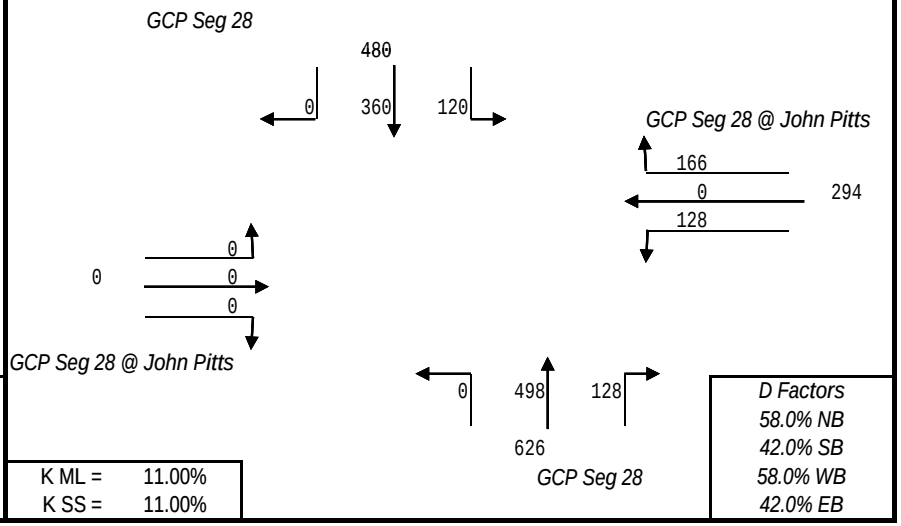
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2026



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2036

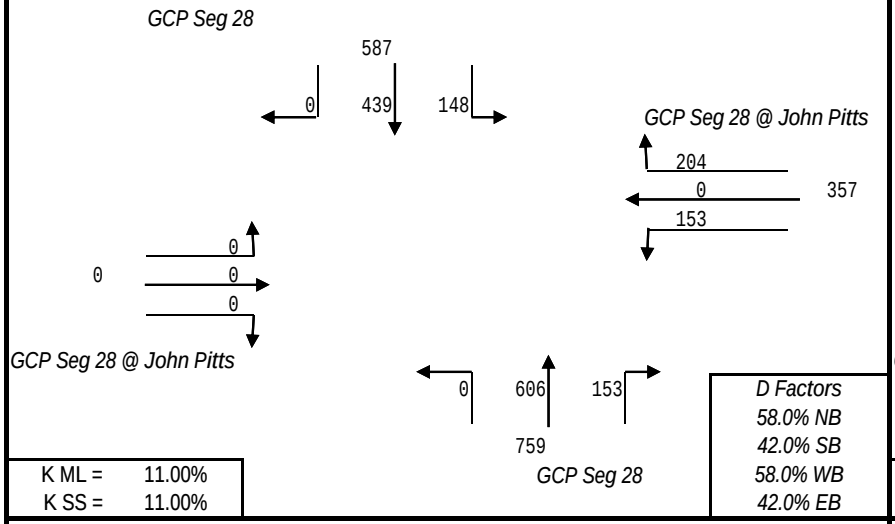


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

PROJECT TRAFFIC FOR GCP Seg 28 AT GCP Seg 28 @ John Pitts: TO

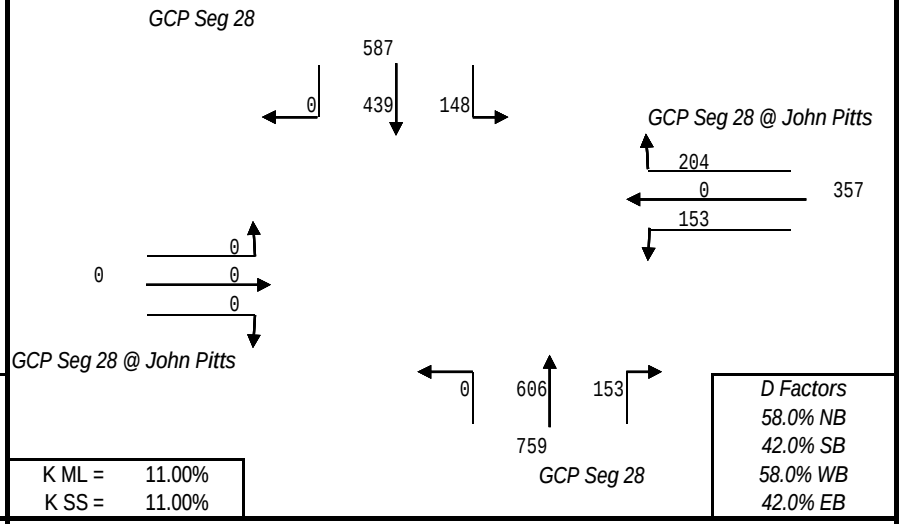
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

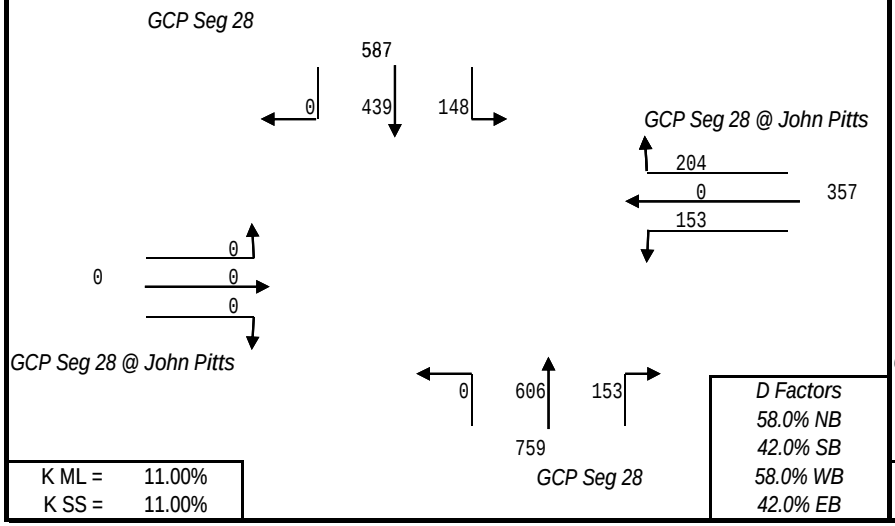
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2016



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

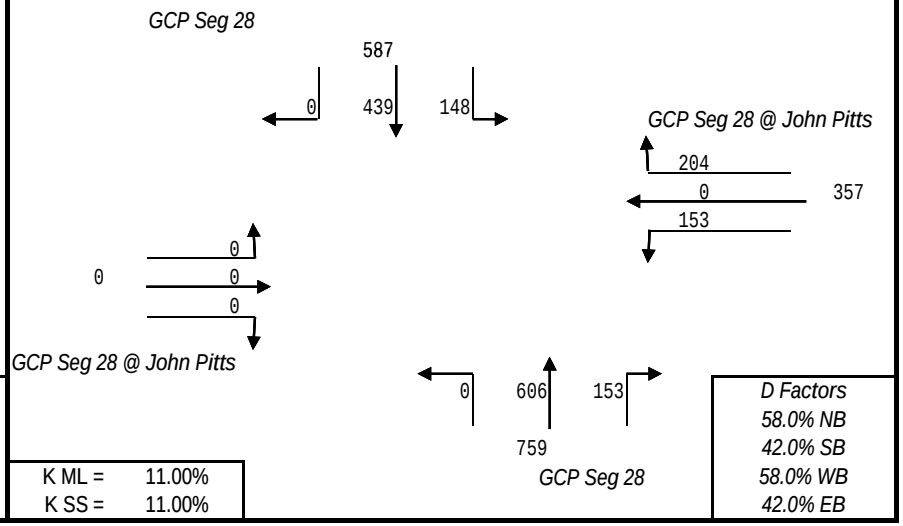
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2026



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2036

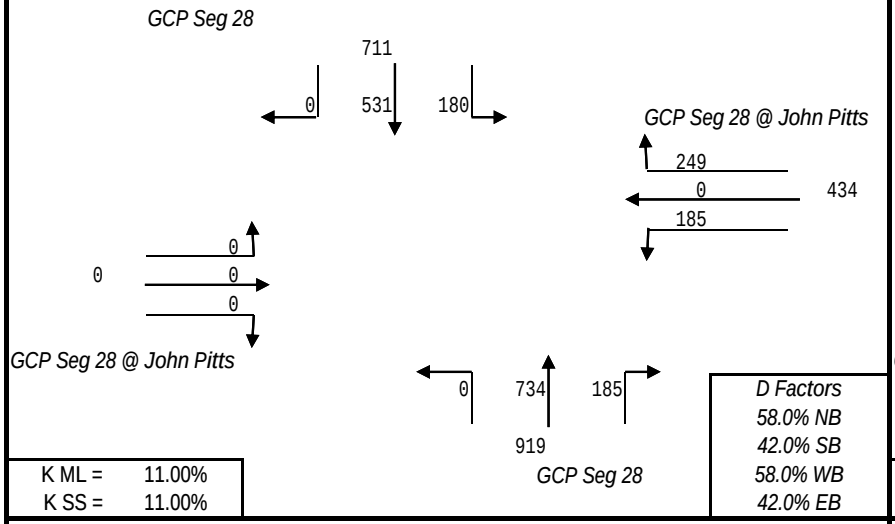


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

PROJECT TRAFFIC FOR GCP Seg 28 AT GCP Seg 28 @ John Pitts: TO

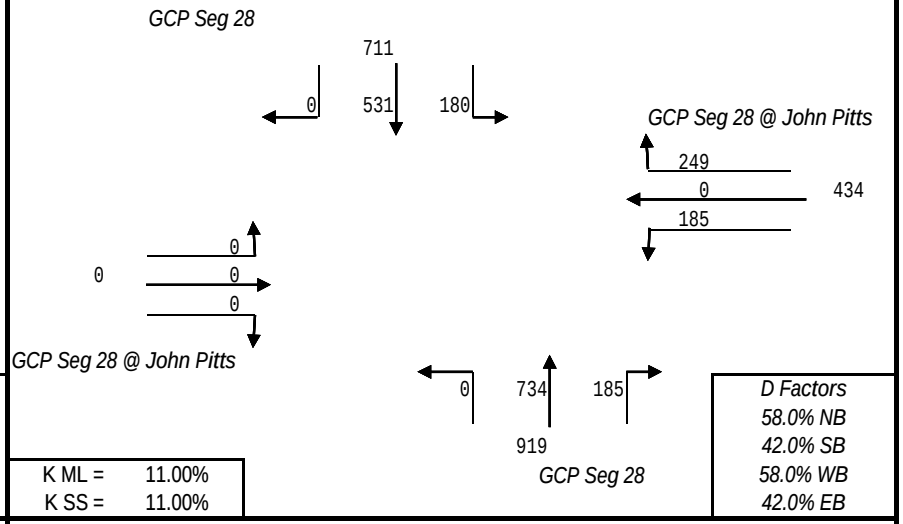
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

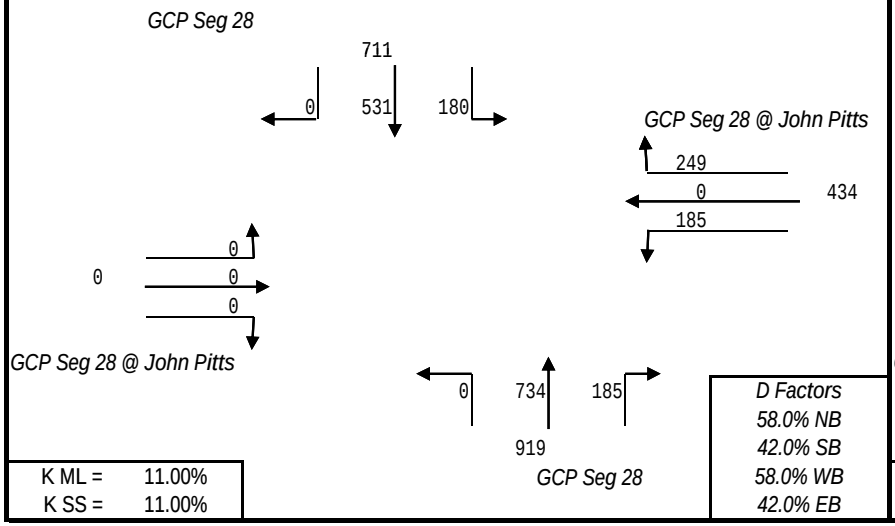
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2016



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

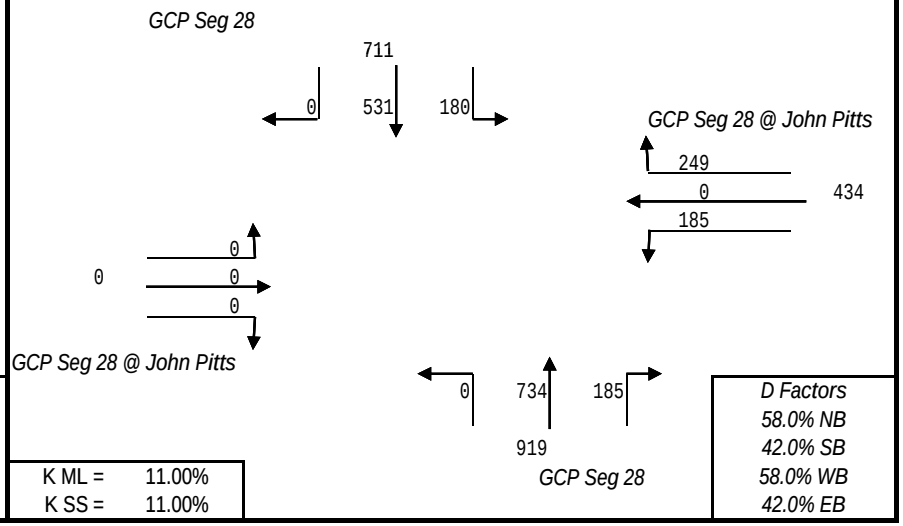
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2026



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2036

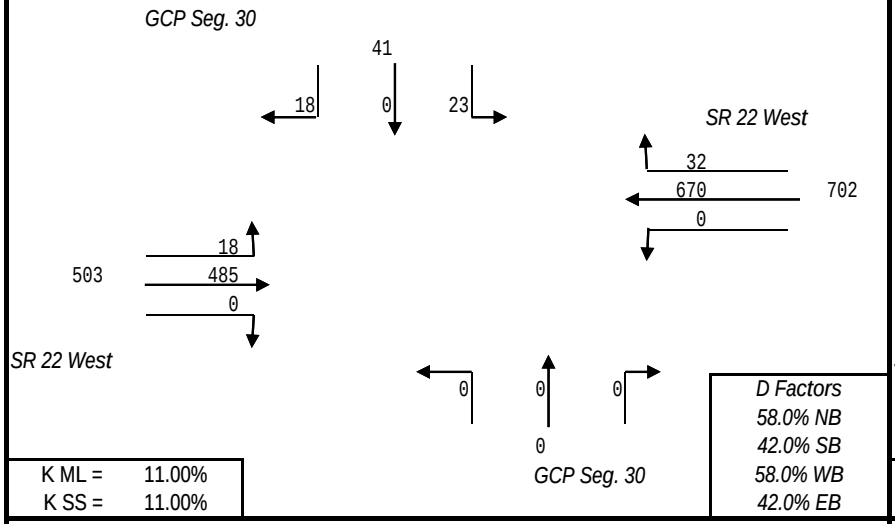


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

PROJECT TRAFFIC FOR GCP Seg. 30 AT SR 22 West: TO

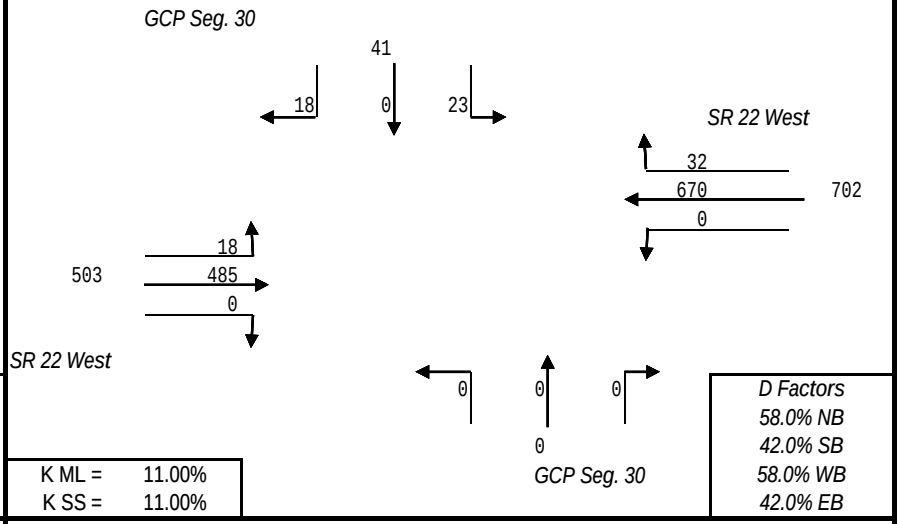
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

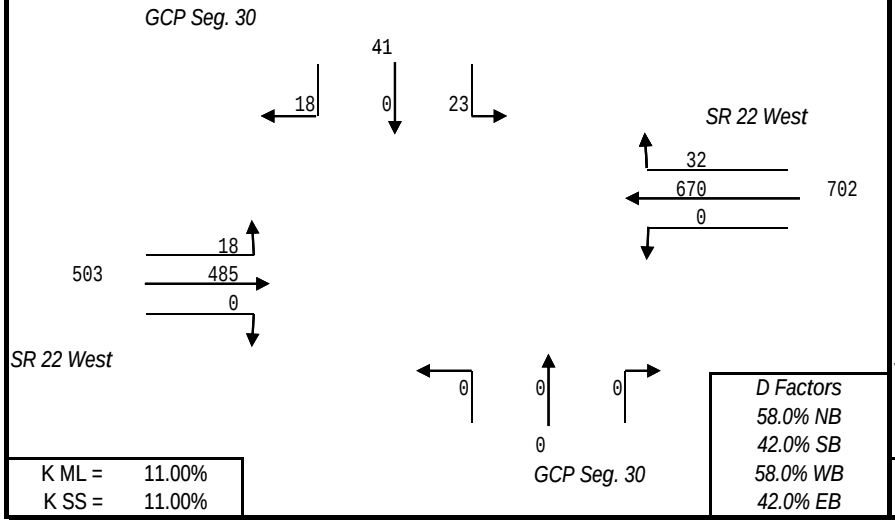
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

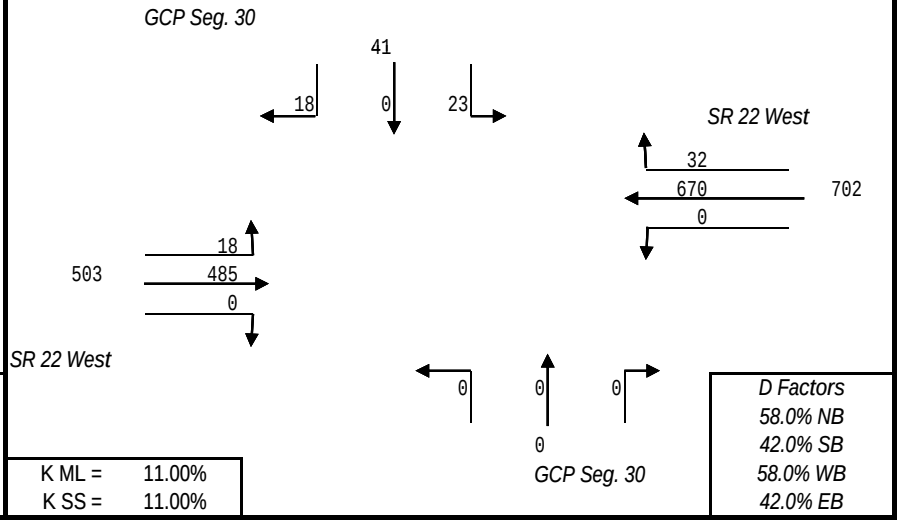
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

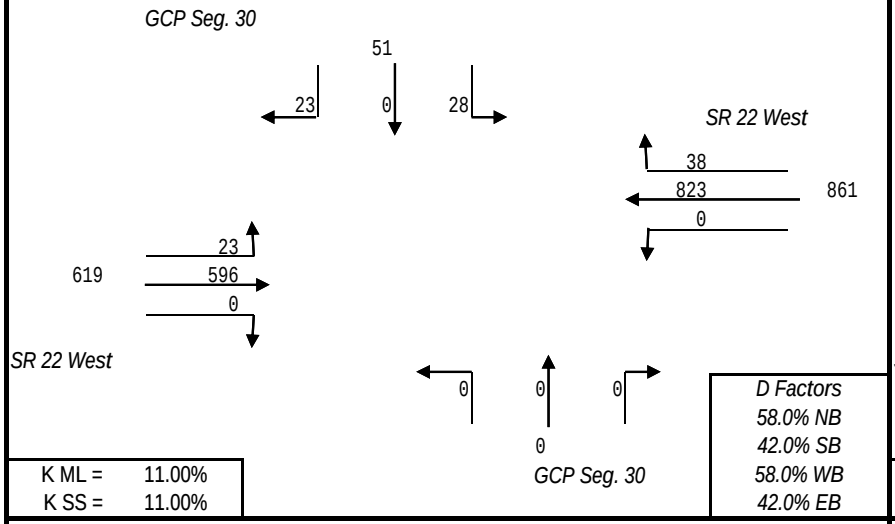


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% NB
42.0% SB
58.0% WB
42.0% EB

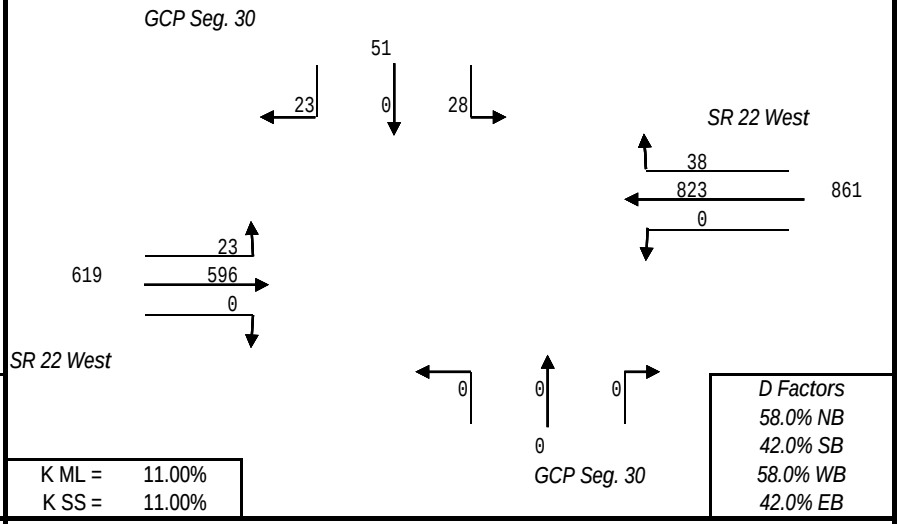
PROJECT TRAFFIC FOR GCP Seg. 30 AT SR 22 West: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



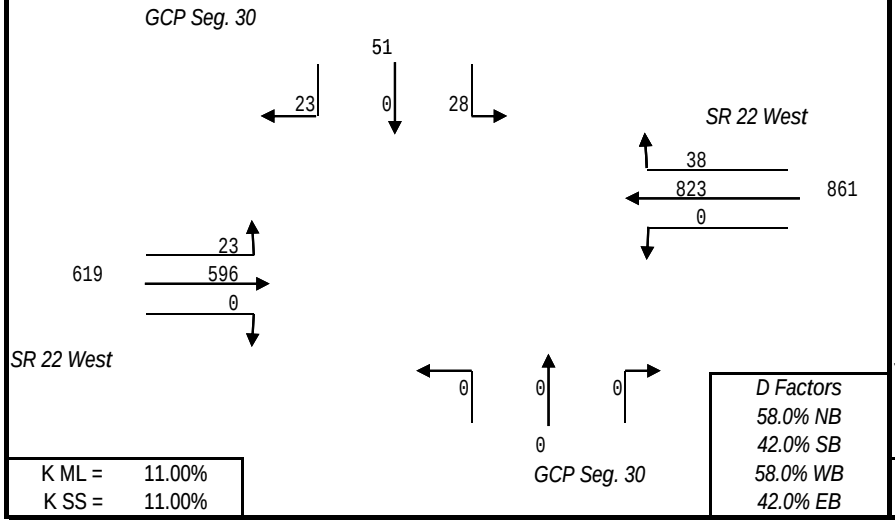
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



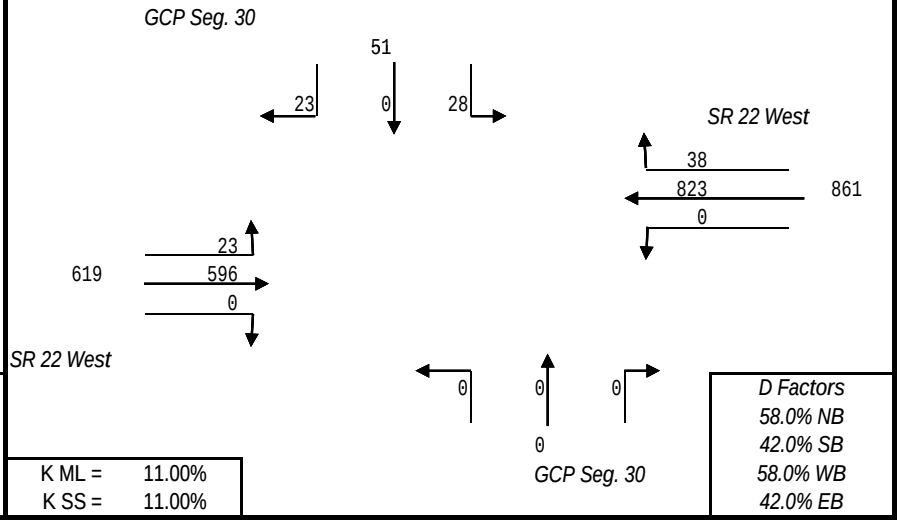
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML = 11.00%
K SS = 11.00%

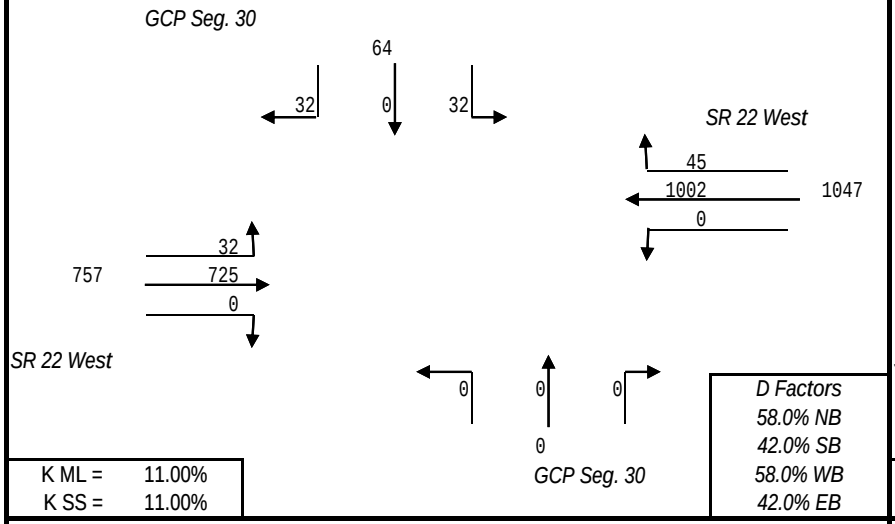
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML = 11.00%
K SS = 11.00%

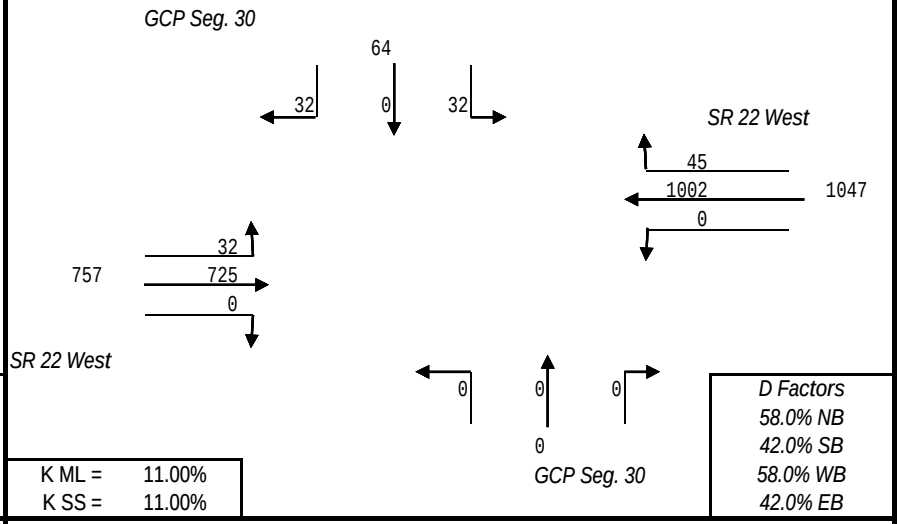
PROJECT TRAFFIC FOR GCP Seg. 30 AT SR 22 West: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



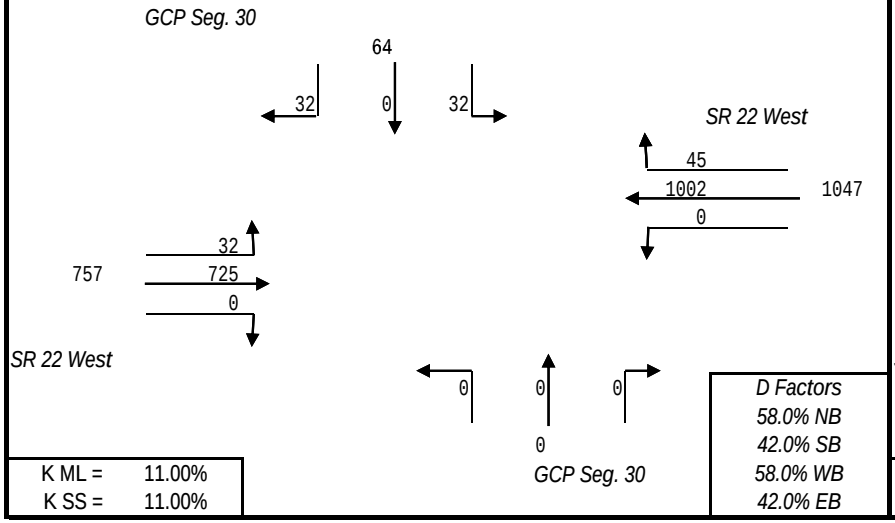
K ML =	11.00%
K SS =	11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



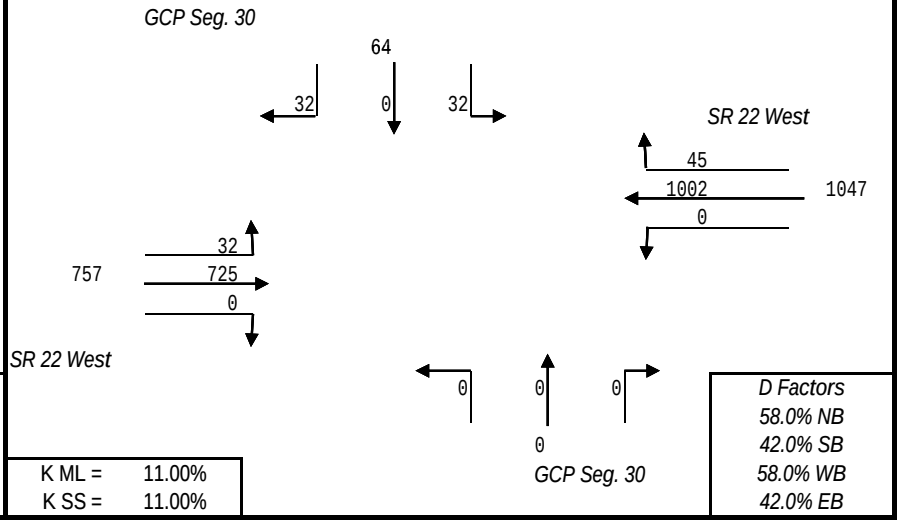
K ML =	11.00%
K SS =	11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

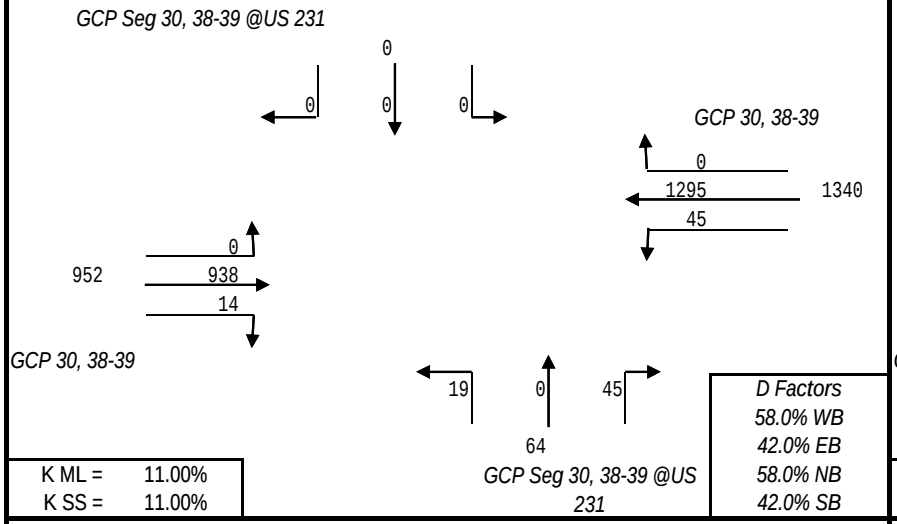
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML =	11.00%
K SS =	11.00%

PROJECT TRAFFIC FOR GCP 30, 38-39 AT GCP Seg 30, 38-39 @US 231: TO

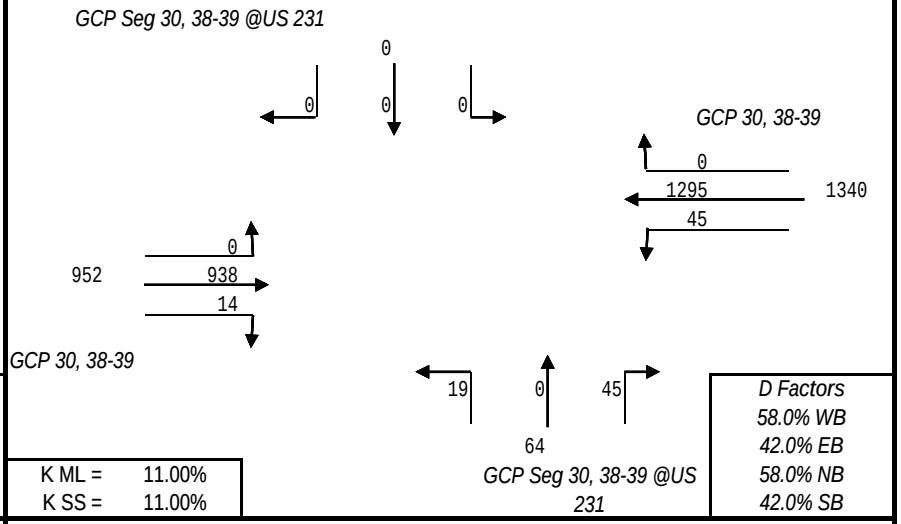
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

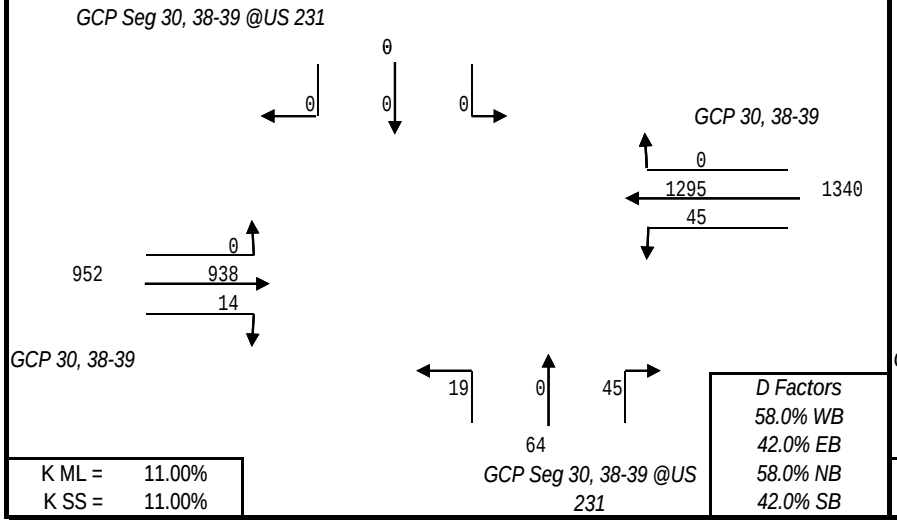
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

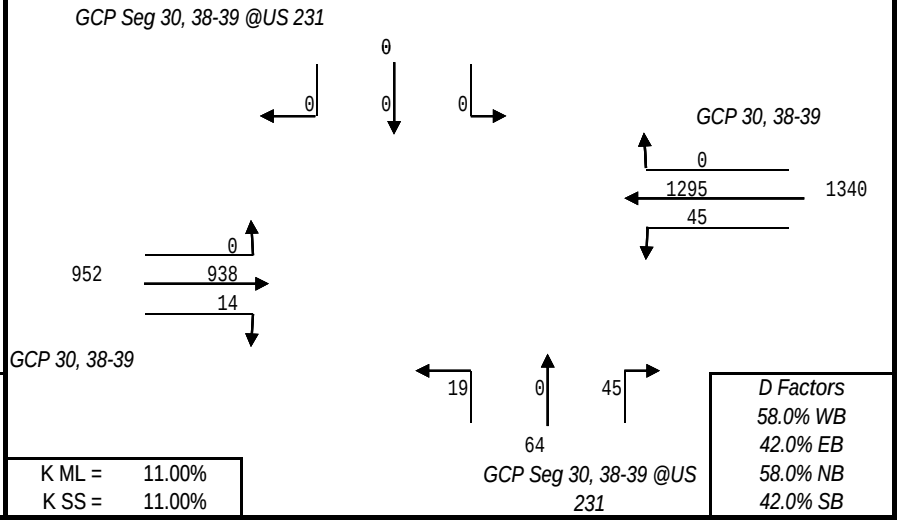
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

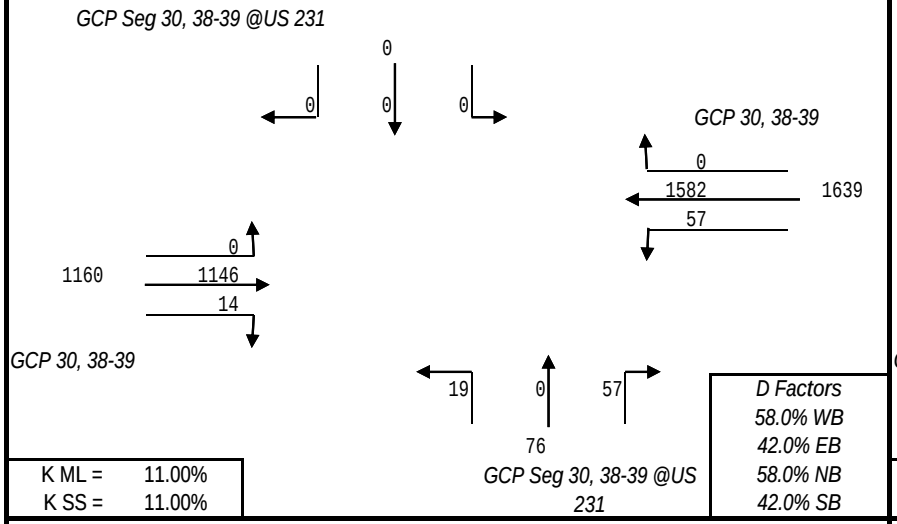


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR GCP 30, 38-39 AT GCP Seg 30, 38-39 @US 231: TO

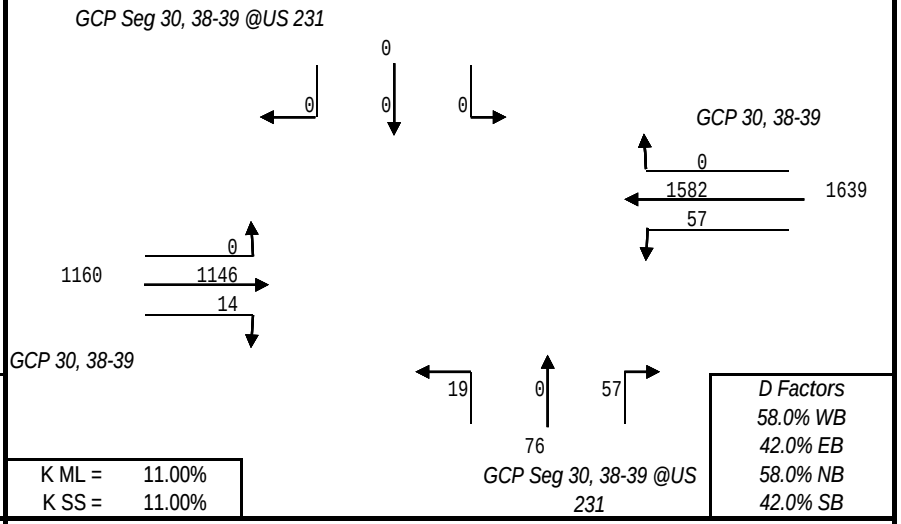
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

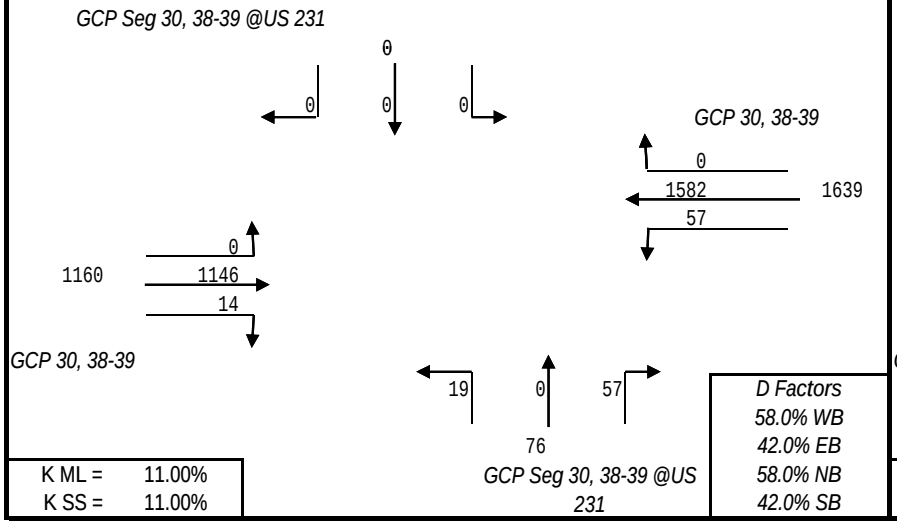
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

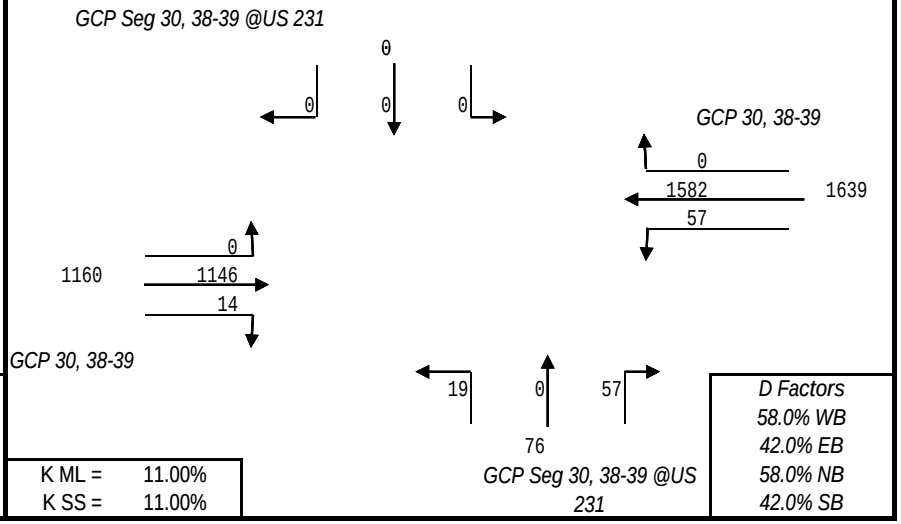
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

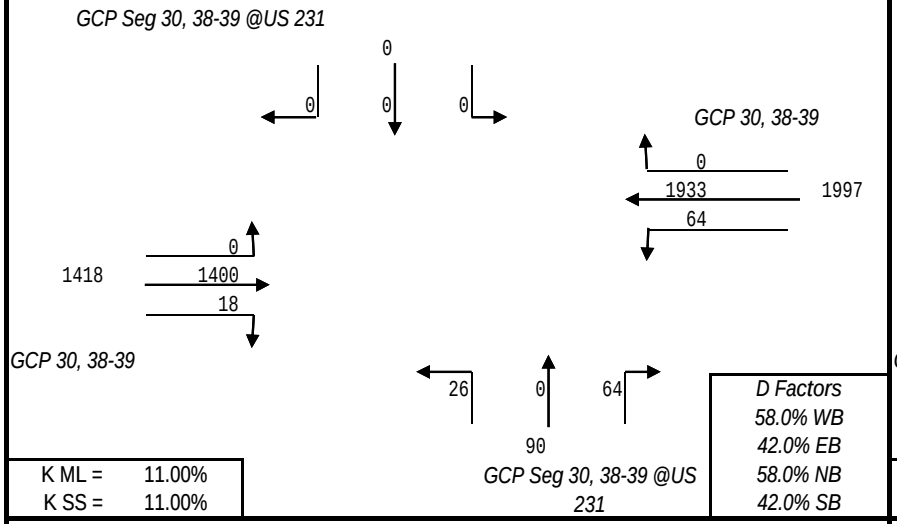


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

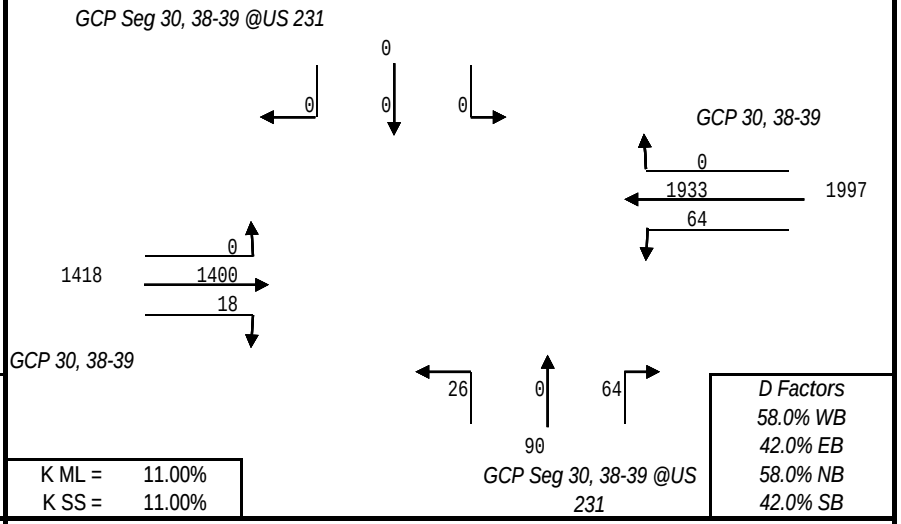
PROJECT TRAFFIC FOR GCP 30, 38-39 AT GCP Seg 30, 38-39 @US 231: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



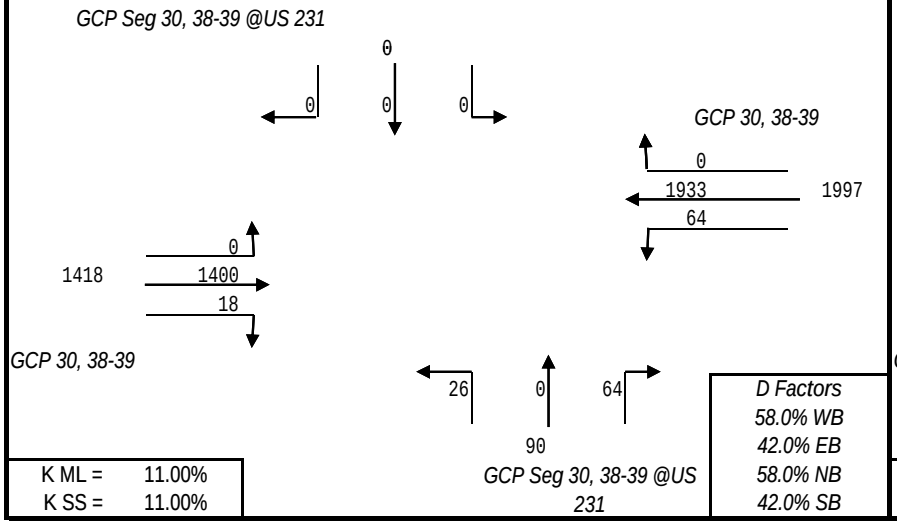
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



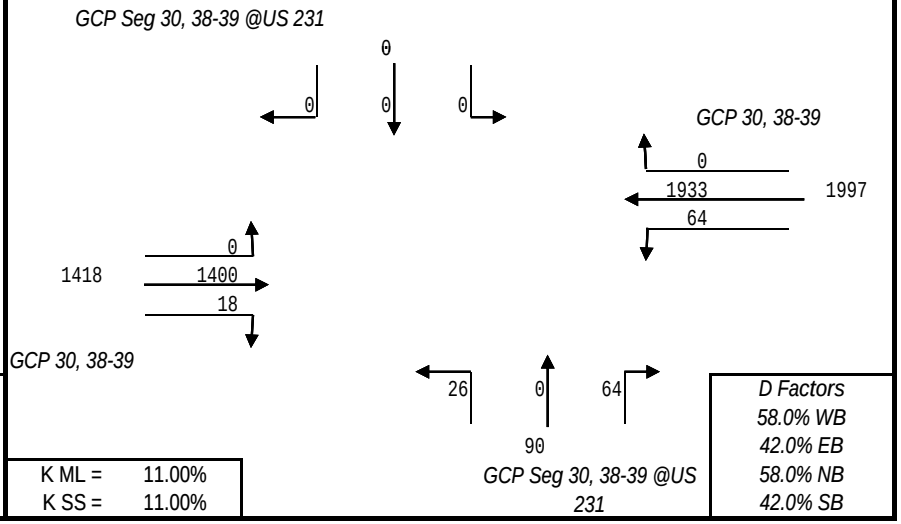
K ML = 11.00%
K SS = 11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML = 11.00%
K SS = 11.00%

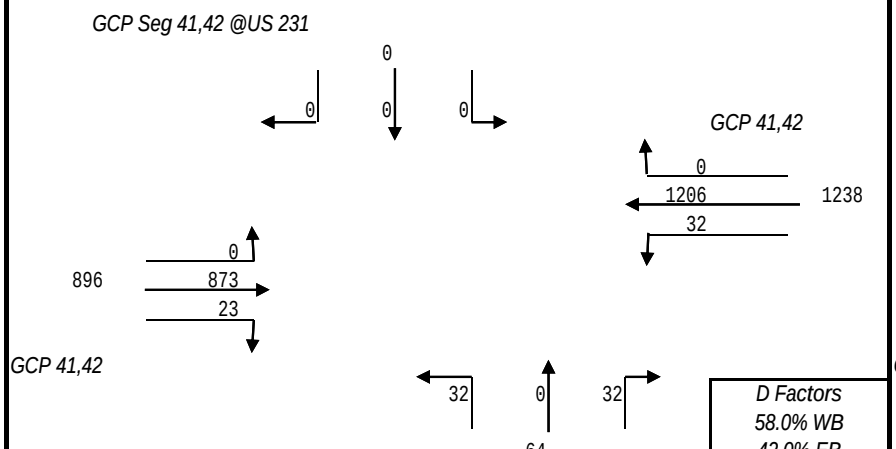
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML = 11.00%
K SS = 11.00%

PROJECT TRAFFIC FOR GCP 41,42 AT GCP Seg 41,42 @US 231: TO

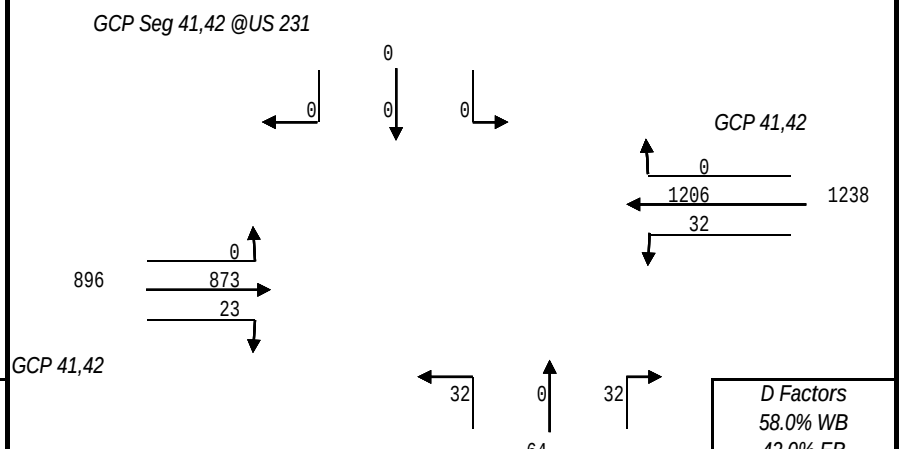
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

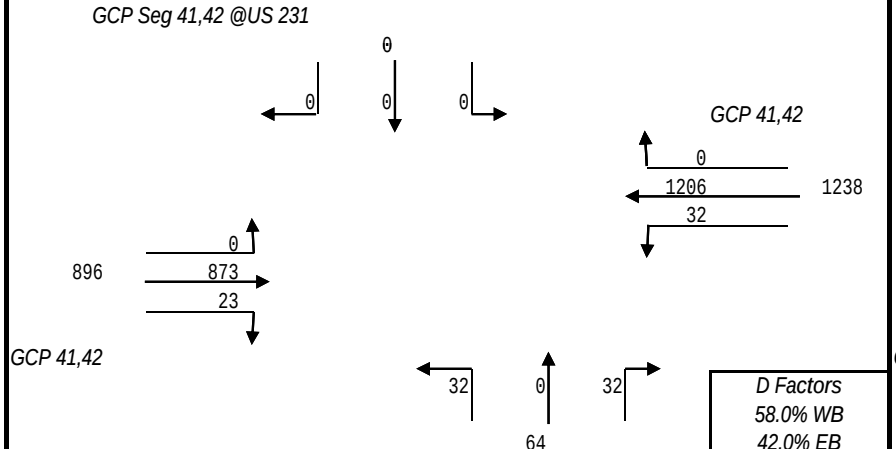
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

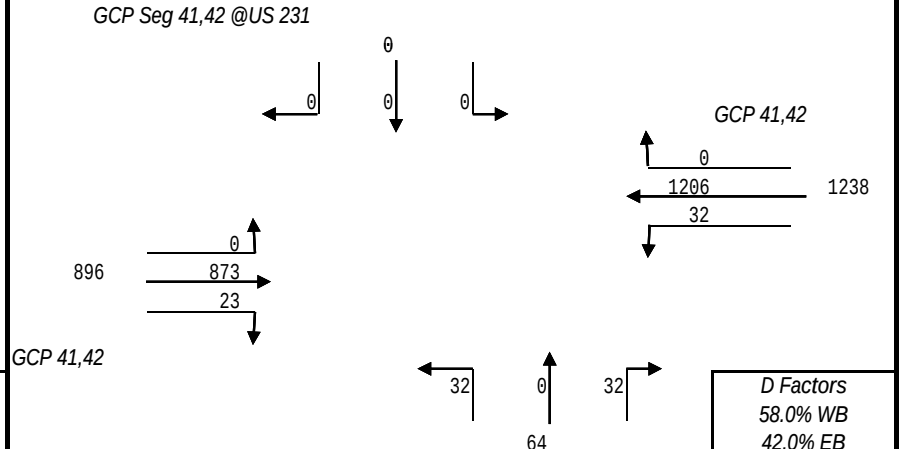
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

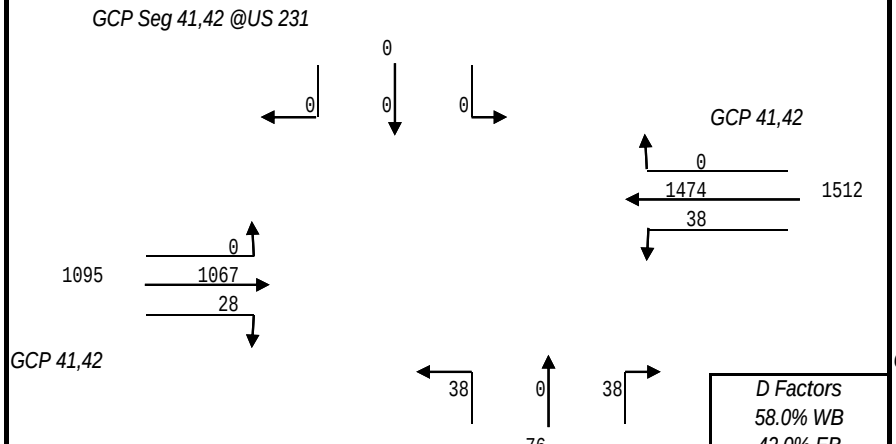


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

PROJECT TRAFFIC FOR GCP 41,42 AT GCP Seg 41,42 @US 231: TO

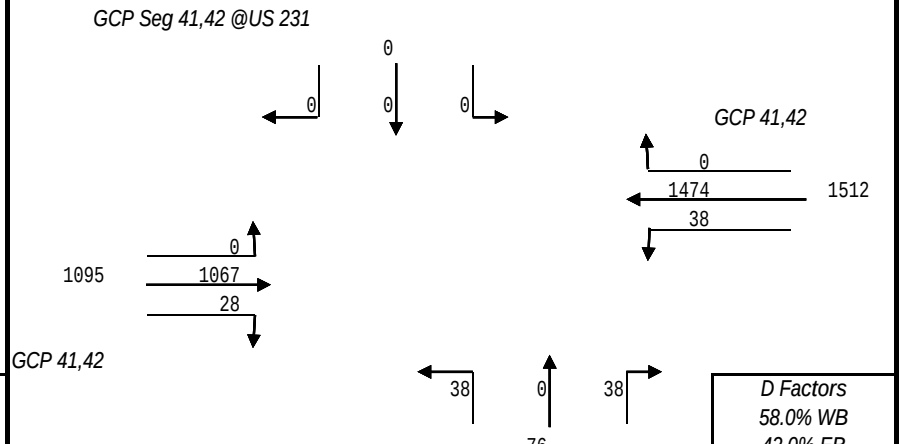
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

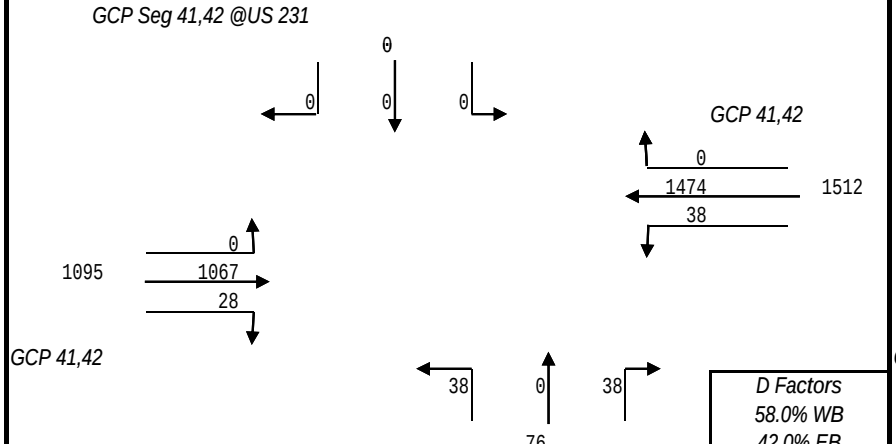
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

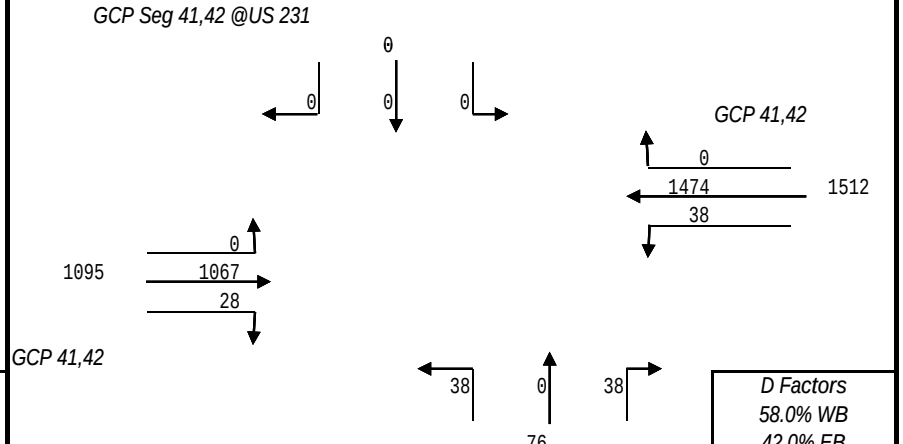
1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032

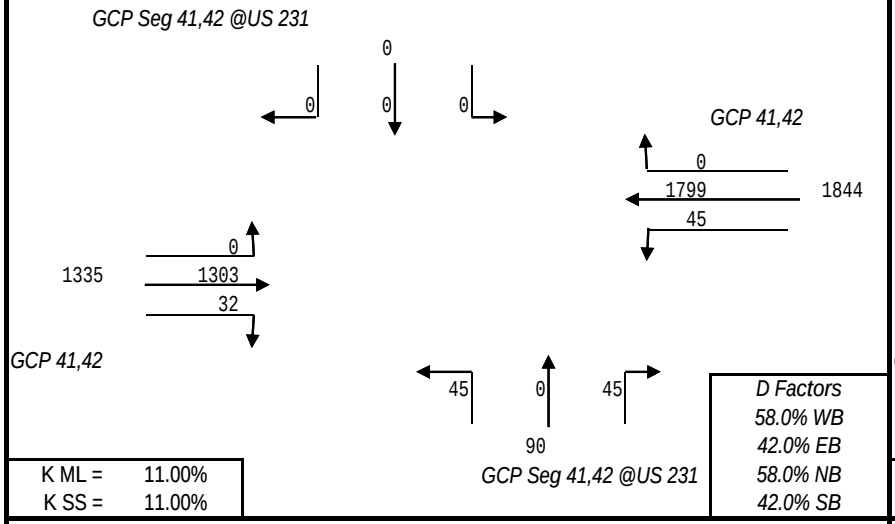


K ML =	11.00%
K SS =	11.00%

D Factors
58.0% WB
42.0% EB
58.0% NB
42.0% SB

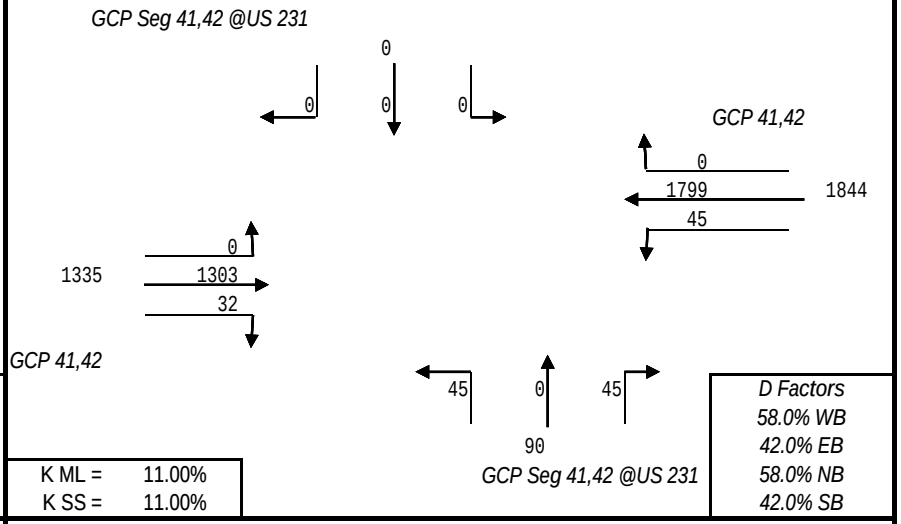
PROJECT TRAFFIC FOR GCP 41,42 AT GCP Seg 41,42 @US 231: TO

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2005



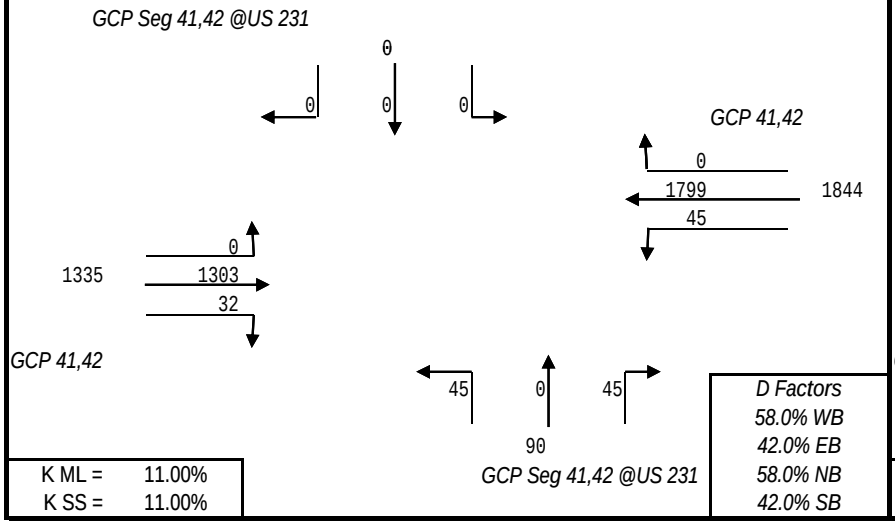
K ML =	11.00%
K SS =	11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2012



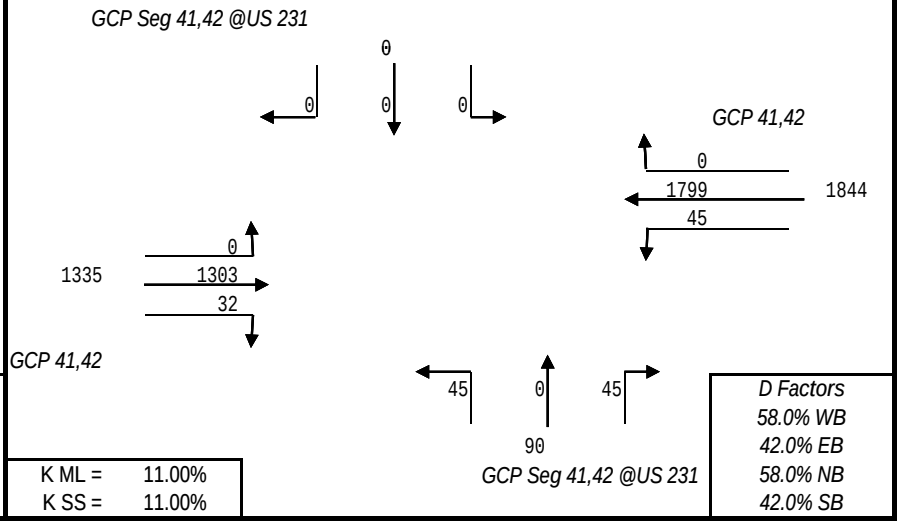
K ML =	11.00%
K SS =	11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2022



K ML =	11.00%
K SS =	11.00%

1-WAY DESIGN HOUR TURNING MOVEMENTS IN YEAR 2032



K ML =	11.00%
K SS =	11.00%

APPENDIX D
GULF COAST PARKWAY @ US 231 / CR 390 / CR 2321 (GCP NORTH TERMINI) TRAFFIC ANALYSIS TECHNICAL MEMORANDUM

Memorandum

Date: March 28, 2007 (Revised September 19, 2007)

To: Rosemary Woods, PBS&J

From: Steve Mikesell, PBS&J

Re: Gulf Coast Parkway @ US 231/CR 390/CR 2321 (GCP North Termini)
Traffic Analysis Technical Memorandum

CC: Cesar Segovia, PBS&J
Greg Garrett, PBS&J
Joel Leisch

The purpose of this memorandum is to summarize the analysis of two conceptual roadway plans developed by Joel Leisch for the intersections of US 231 at CR 390 and US 231 at CR 2321 if the proposed Gulf Coast Parkway (GCP) alignment crossed US 231 in the vicinity. The "Interim" scenario, as shown in Figure 1, involves the following roadway modifications:

- Realign CR 390 to intersect with the proposed GCP, running parallel to US 231.
- Realign CR 2321 from the north to align with the proposed GCP. A portion of CR 2321 would remain between US 231 and the new CR 390 alignment.
- Convert the existing intersection of US 231 and CR 390 from a full movement access signalized intersection to an unsignalized right-in/right-out intersection.

A "Full Buildout" scenario was also developed. It would consist of the Interim scenario plus an extension of the new CR 390 realignment. The new CR 390 segment would extend from the proposed GCP intersection and curve to the southeast, creating a new T-intersection with US 231, as shown in Figure 2. Currently, US 231 is a four-lane facility, however there is a potential for widening to six lanes in the future as part of a separate roadway project. Each of the scenarios was analyzed with US 231 having either 4 or 6 lanes. The Interim scenario was analyzed with 2012 and 2032 projected traffic conditions. The Full Buildout scenario was analyzed with only 2032 traffic conditions. The projected traffic volumes for 2012 and 2032 are included in Appendix A of this memorandum.

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The traffic analysis was conducted using Synchro traffic software which uses the Highway Capacity Manual (HCM) methodology to determine signalized intersection level of service (LOS). Highway Capacity Software (HCS) was used for the unsignalized intersection analysis. Signal timings for all intersections were optimized using Synchro's optimization tool to achieve optimal intersection operating conditions and traffic progression. The HCS software is unable to analyze a stop controlled intersection with a mainline roadway having three through lanes in one direction (i.e. all 6 lane US 231 scenarios). Therefore, the through traffic volume was reduced by one-third and the through lane input remained two (2) lanes to account for this.

The results of the traffic operational analyses are summarized in Tables 1, 2, and 3. The results of the 2012 Interim scenario traffic conditions analysis indicate that all study intersections would operate with acceptable LOS C or better traffic conditions with either 4 or 6 lanes on US 231. By 2032 the intersections of US 231 and CR 2321 and US 231 and Old CR 390 (stop sign controlled side street right turn movement) would have unacceptable LOS conditions if US 231 remains a 4 lane facility. If US 231 is widened to 6 lanes, all intersections would operate at LOS D or better with the Interim scenario.

In order to estimate when the intersections of US 231 and CR 2321 and US 231 and Old CR 390 would fail with the Interim scenario and US 231 being a 4 lanes roadway, a failure analysis was performed. Assuming straight line growth, the 2022 traffic conditions were estimated by averaging the 2012 and 2032 traffic volumes. With these 2022 volumes both intersections would operate with acceptable LOS D or better conditions. Therefore, the Interim scenario would be acceptable with a 4 lane US 231 until sometime after 2022.

The Full Buildout scenario was analyzed with 2032 traffic conditions. If US 231 remains a 4 lane roadway, the new intersection of US 231 and new CR 390 would operate at a LOS E in both the AM and PM peak periods. With US 231 having 6 lanes, all intersections would operate at LOS C or better.

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Modifications that may be able to be considered for cost or right-of-way savings with both scenarios and still maintain acceptable LOS conditions:

- Signal may not be necessary at intersection of new CR 390 and Old CR 390, would operate at acceptable LOS in 2012, but not 2032.
- Single EB right turn lane at new CR 390 and Old US 2321 may be sufficient
- Add a WB acceleration lane for SB right turns from Old CR 390 to US 231.

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Figure 1. Interim Scenario Conceptual Geometry

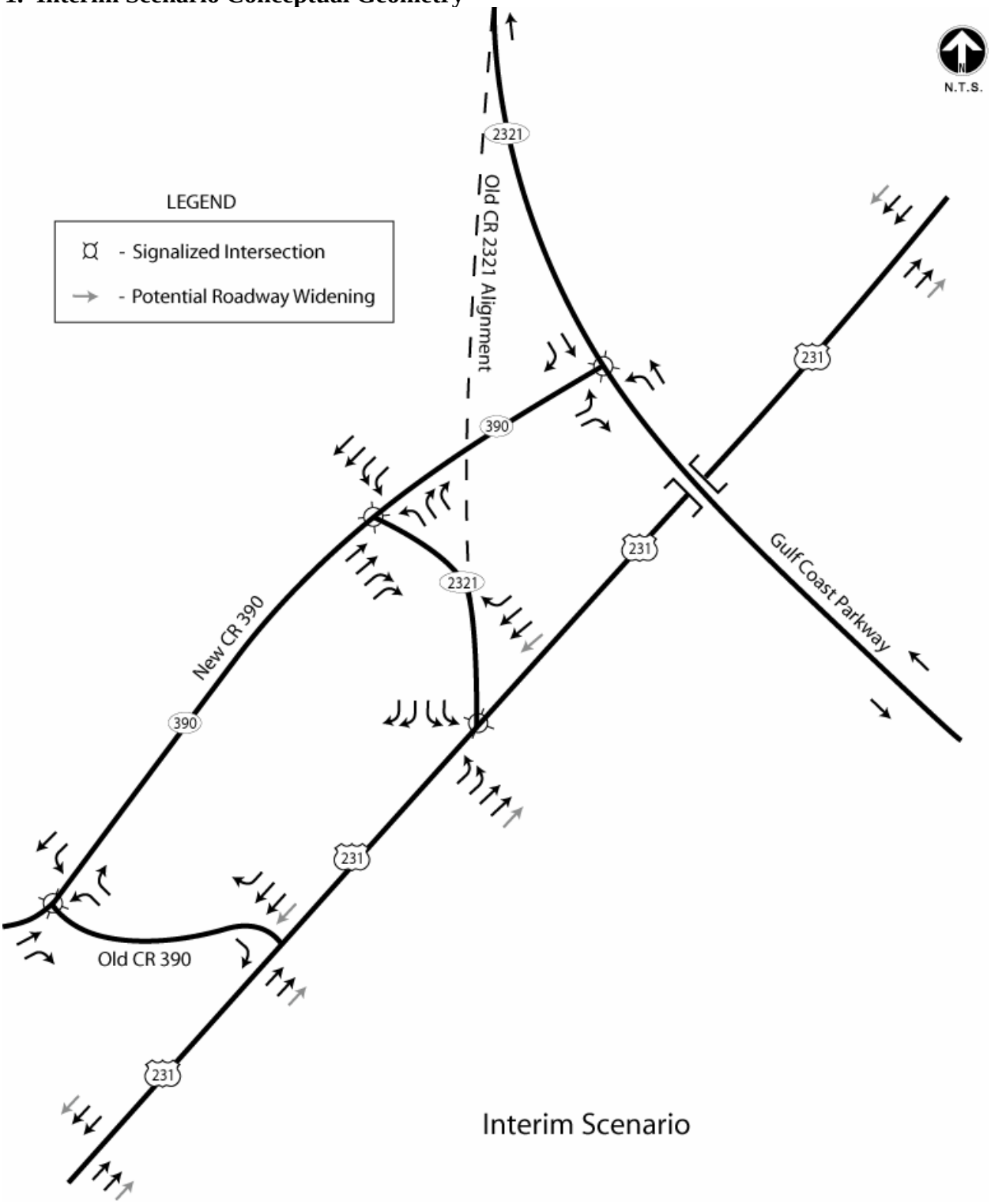

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Table 1. Intersection Capacity Analysis Results – Interim Scenario (4 lane US 231)

Intersection Delay and Levels of Service (LOS) in Seconds/Vehicle

Intersection	2012				2032			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
US 231 / Old CR 390	13.8	B	11.5	B	**152.5**	**F**	19.5	C
US 231 / CR 2321	23.7	C	22.7	C	**79.8**	**E**	**67.1**	**E**
Old CR 390 / New CR 390	10.4	B	9.4	A	13.7	B	13.1	B
New CR 390 / CR 2321	11.1	B	12.7	B	42.7	D	28.4	C
New CR 390 / GCP	18.5	B	19.2	B	41.3	D	17.5	B

Table 2. Intersection Capacity Analysis Results - Interim Scenario (6 lane US 231)

Intersection Delay and Levels of Service (LOS) in Seconds/Vehicle

Intersection	2012				2032			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
US 231 / Old CR 390	11.0	B	10.2	B	12.7	B	12.9	B
US 231 / CR 2321	10.9	B	11.0	B	28.2	C	38.0	D
Old CR 390 / New CR 390	7.2	A	7.2	A	9.7	A	11.0	B
New CR 390 / CR 2321	18.5	B	15.4	B	20.0	B	32.3	C
New CR 390 / GCP	11.1	B	12.1	B	23.9	C	27.5	C

Note: Bold values indicate unacceptable conditions.

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Figure 2. Full Buildout Scenario Conceptual Geometry

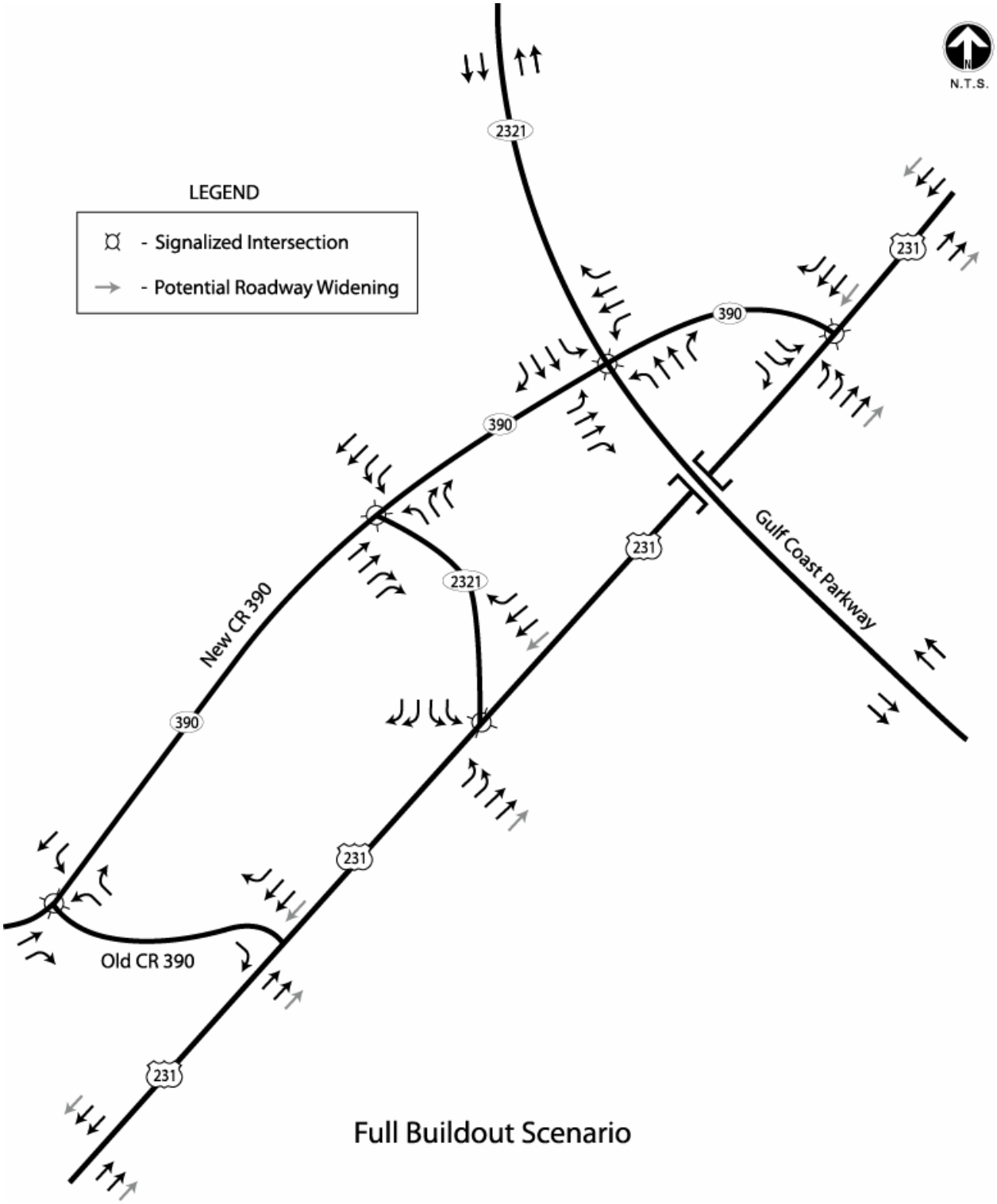

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Table 3. Intersection Capacity Analysis Results – Full Buildout Scenario (4 and 6 Lane US 231)

Intersection Delay and Levels of Service (LOS) in Seconds/Vehicle

Intersection	2032 with 4 Lane US 231				2032 with 6 Lane US 231			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
US 231 / Old CR 390	30.8	D	15.0	C	14.0	B	11.4	B
US 231 / CR 2321	39.2	D	34.7	C	9.6	A	16.9	B
Old CR 390 / New CR 390	10.4	B	9.8	A	10.9	B	10.5	B
New CR 390 / CR 2321	15.9	B	21.3	C	26.6	C	19.9	B
New CR 390 / GCP	28.8	C	25.5	C	29.8	C	25.0	C
US 231 / New CR 390	**78.3**	**E**	**59.5**	**E**	26.0	C	15.4	B

Note: Bold values indicate unacceptable conditions.

QUEUING ANALYSIS

A SimTraffic queuing analysis was performed to determine the necessary turn lane storage needs for the Interim and Full Buildout scenarios (both assuming a 6 lane US 231). The 2032 AM and PM peak hour traffic conditions were used for the queuing analysis and an hour of simulation was run to determine the 95th percentile queue lengths for all left and right turn lanes. The resulting 95th percentile queue lengths were rounded to the nearest 25 feet and are illustrated in Figures 3 and 4. The queue lengths for through movements are provided so that the turn lane lengths can be checked to ensure that queues in the through lanes would not block turning vehicles from entering the turn lanes. *Note: These values are queue lengths only and do not include deceleration and taper lengths as described in the FDOT Standard Index 301. Queue length is 0' if not provided.*

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Figure 3. Interim Scenario Queue Lengths

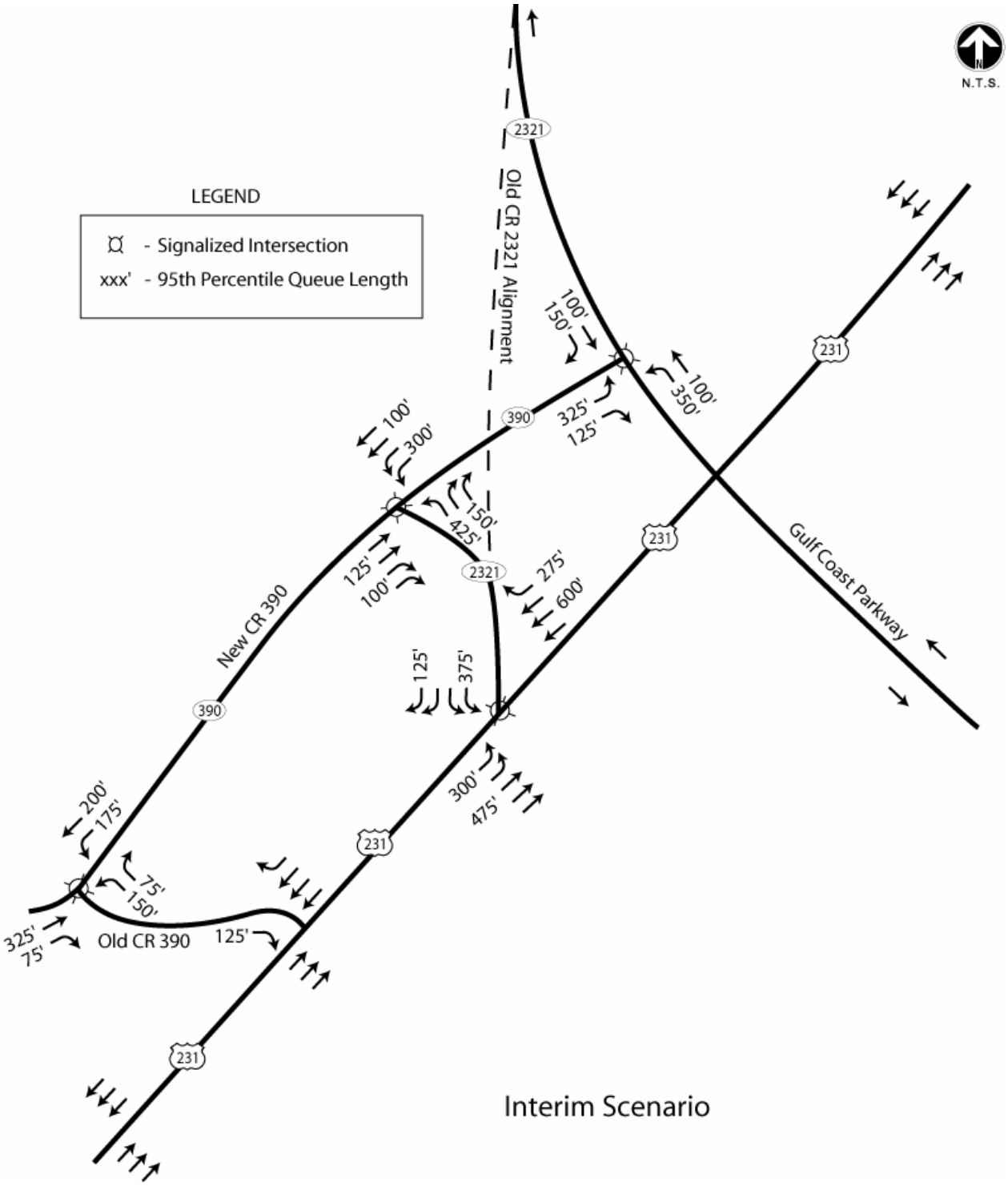

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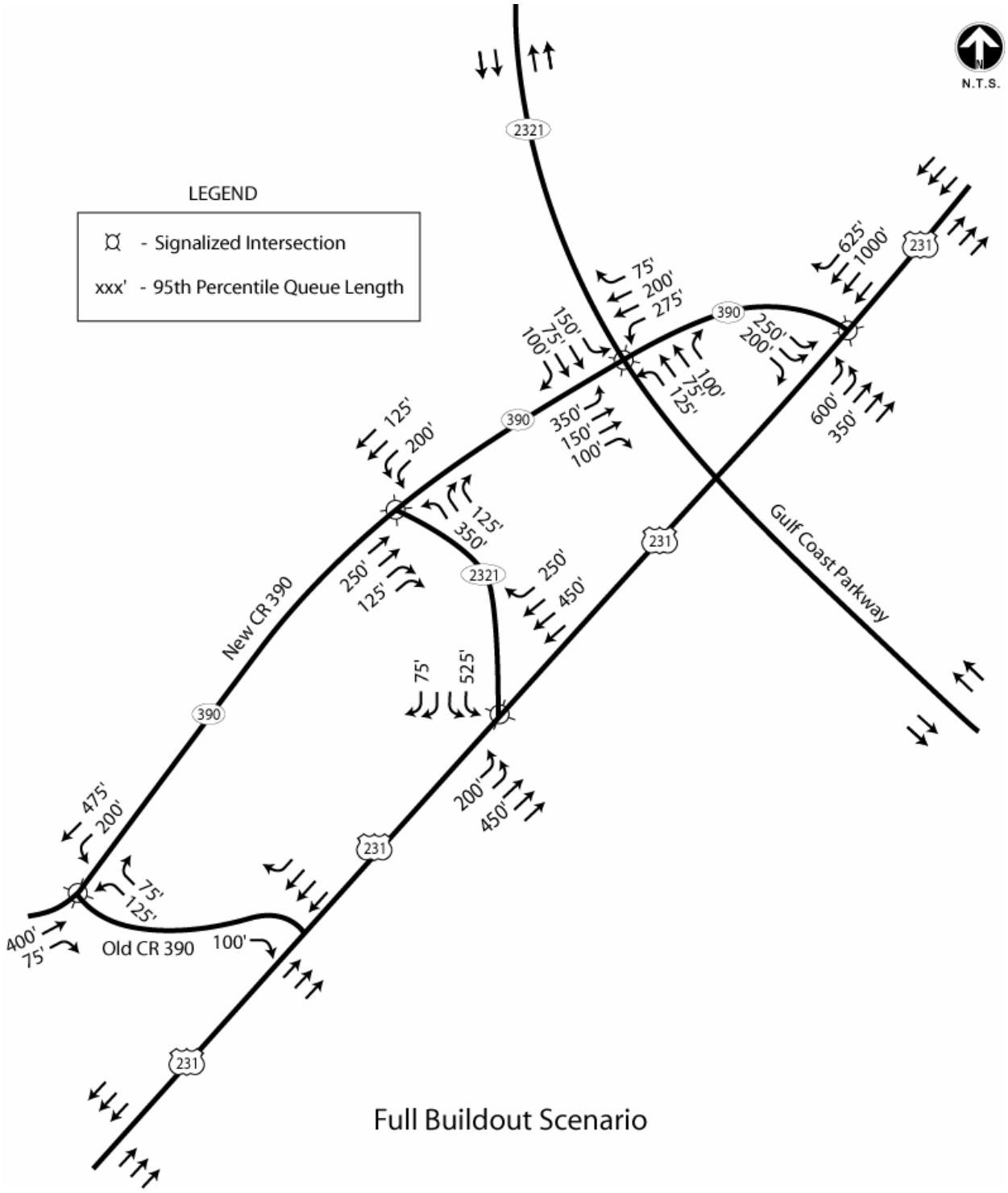
Figure 4. Full Buildout Scenario Queue Lengths



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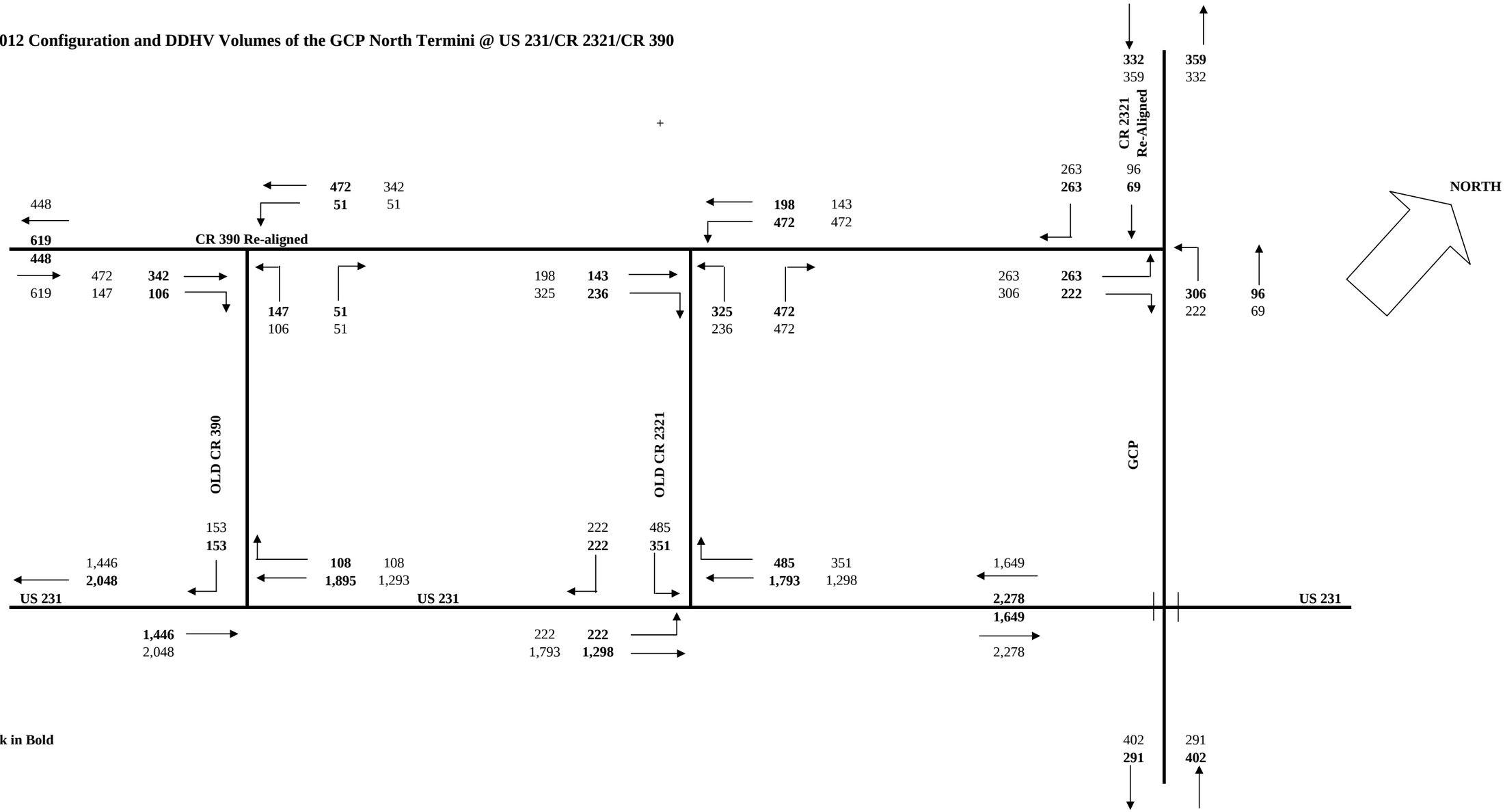
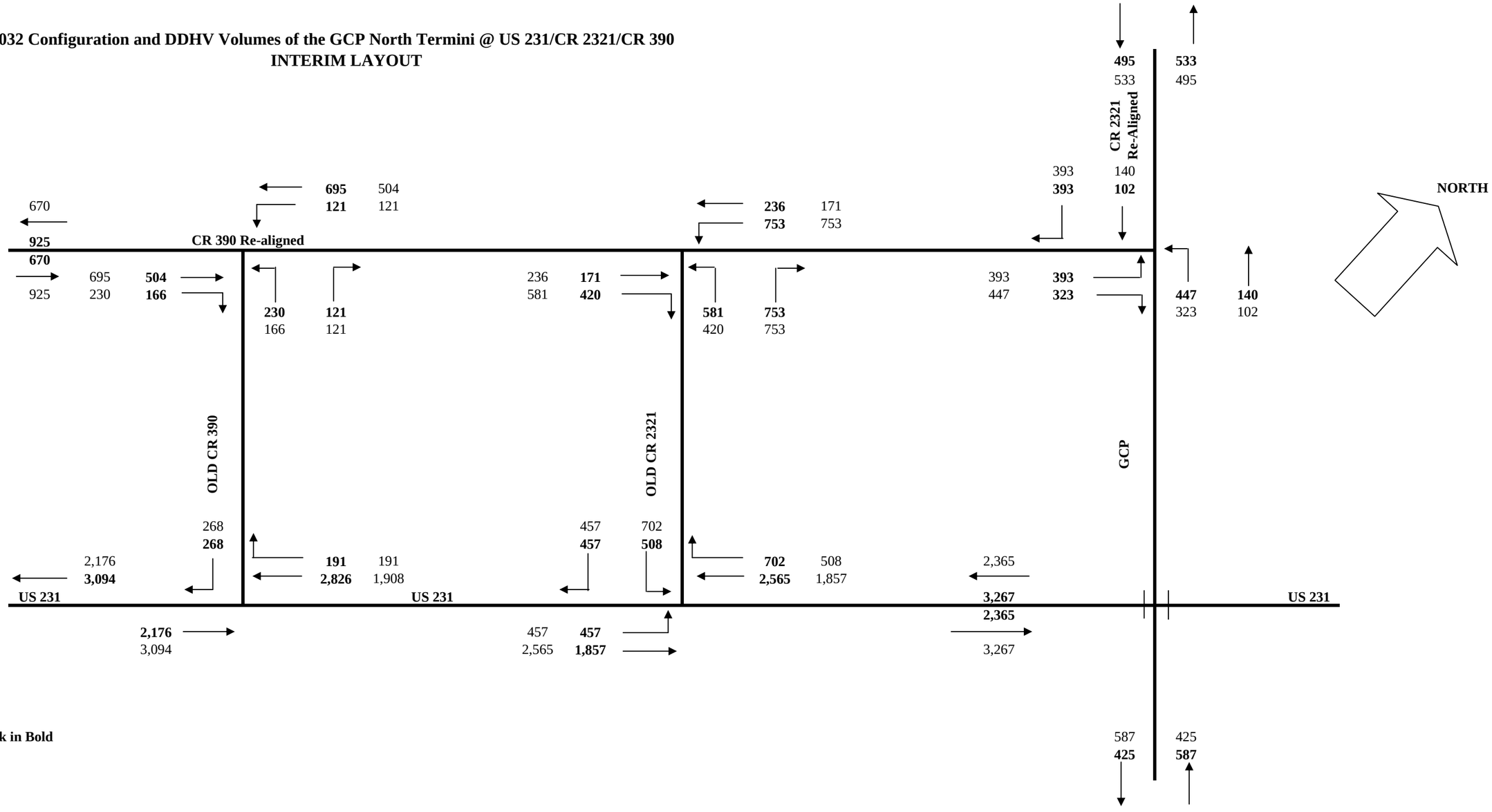
Appendix A – 2012 and 2032 Traffic Volumes

Year 2012 Configuration and DDHV Volumes of the GCP North Termini @ US 231/CR 2321/CR 390



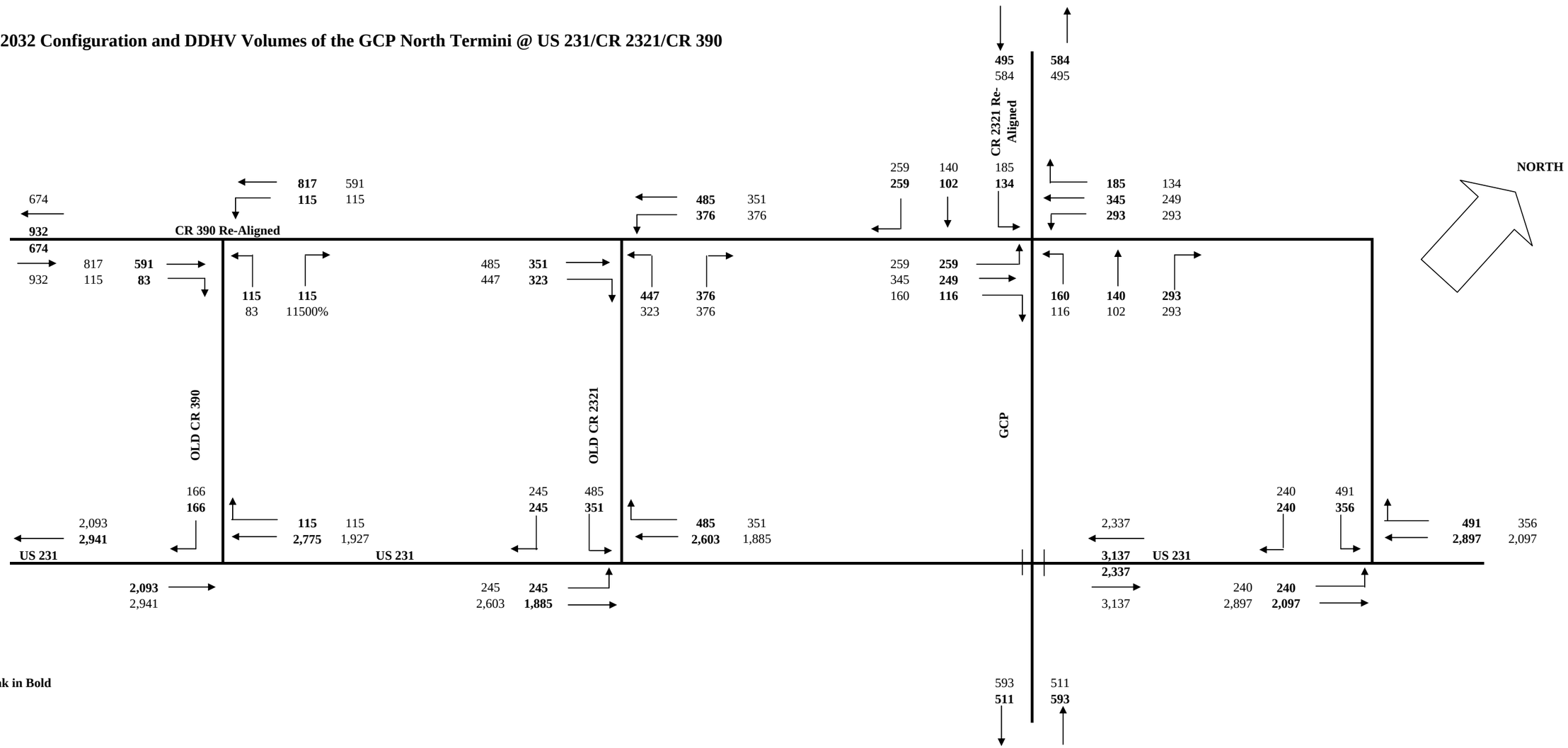
Notes:
AM Peak in Bold

Year 2032 Configuration and DDHV Volumes of the GCP North Termini @ US 231/CR 2321/CR 390
INTERIM LAYOUT



Notes:
AM Peak in Bold

Year 2032 Configuration and DDHV Volumes of the GCP North Termini @ US 231/CR 2321/CR 390



Notes:
AM Peak in Bold

Appendix B – Synchro Signalized HCM Reports & HCS Unsignalized Worksheets

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2012 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1895	108
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					2059	117
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						153
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						166
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								166
C(m) (vph)								573
v/c								0.29
95% queue length								1.20
Control Delay								13.8
LOS								B
Approach Delay							13.8	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	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)	3367	2733	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	3471	3471	1553
Volume (vph)	351	222	222	1298	1793	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	241	241	1411	1949	527
RTOR Reduction (vph)	0	203	0	0	0	8
Lane Group Flow (vph)	382	38	241	1411	1949	519
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	20.3	20.3	12.2	107.7	89.5	109.8
Effective Green, g (s)	22.3	22.3	14.2	109.7	91.5	113.8
Actuated g/C Ratio	0.16	0.16	0.10	0.78	0.65	0.81
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)	536	435	342	2720	2269	1307
v/s Ratio Prot	c0.11		c0.07	0.41	c0.56	0.06
v/s Ratio Perm		0.01				0.27
v/c Ratio	0.71	0.09	0.70	0.52	0.86	0.40
Uniform Delay, d1	55.8	50.2	60.9	5.5	19.2	3.6
Progression Factor	0.86	1.63	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.1	6.5	0.7	4.5	0.2
Delay (s)	52.0	81.9	67.3	6.2	23.7	3.8
Level of Service	D	F	E	A	C	A
Approach Delay (s)	63.6			15.1	19.4	
Approach LOS	E			B	B	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.48	1.00
Satd. Flow (perm)	1736	1553	1827	1553	884	1827
Volume (vph)	147	51	342	106	51	472
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	55	372	115	55	513
RTOR Reduction (vph)	0	37	0	51	0	0
Lane Group Flow (vph)	160	18	372	64	55	513
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	21.0	21.0	37.0	37.0	37.0	37.0
Effective Green, g (s)	23.0	23.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.33	0.33	0.56	0.56	0.56	0.56
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)	570	510	1018	865	493	1018
v/s Ratio Prot	c0.09		0.20			c0.28
v/s Ratio Perm		0.01		0.04	0.06	
v/c Ratio	0.28	0.04	0.37	0.07	0.11	0.50
Uniform Delay, d1	17.4	16.0	8.6	7.2	7.3	9.5
Progression Factor	0.98	1.08	1.00	1.00	0.92	0.76
Incremental Delay, d2	1.1	0.1	1.0	0.2	0.4	1.7
Delay (s)	18.2	17.4	9.6	7.3	7.2	8.9
Level of Service	B	B	A	A	A	A
Approach Delay (s)	18.0		9.1			8.7
Approach LOS	B		A			A

Intersection Summary			
HCM Average Control Delay	10.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	325	472	143	236	472	198
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	353	513	155	257	513	215
RTOR Reduction (vph)	0	147	0	220	0	0
Lane Group Flow (vph)	353	366	155	37	513	215
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	22.5	44.0	8.0	8.0	21.5	35.5
Effective Green, g (s)	24.5	48.0	10.0	10.0	23.5	37.5
Actuated g/C Ratio	0.35	0.69	0.14	0.14	0.34	0.54
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)	608	2030	496	390	1130	1859
v/s Ratio Prot	c0.20	0.06	c0.04		c0.15	0.06
v/s Ratio Perm		0.07		0.01		
v/c Ratio	0.58	0.18	0.31	0.09	0.45	0.12
Uniform Delay, d1	18.6	3.9	26.9	26.1	18.2	8.0
Progression Factor	0.88	0.56	0.72	0.37	0.78	0.62
Incremental Delay, d2	1.3	0.0	1.6	0.5	1.3	0.1
Delay (s)	17.6	2.2	21.1	10.1	15.5	5.1
Level of Service	B	A	C	B	B	A
Approach Delay (s)	8.5		14.2			12.5
Approach LOS	A		B			B

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.71	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1294	1827	1736	1553
Volume (vph)	69	263	306	96	263	222
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	286	333	104	286	241
RTOR Reduction (vph)	0	184	0	0	0	182
Lane Group Flow (vph)	75	102	333	104	286	59
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	23.0	23.0	43.0	43.0	15.0	15.0
Effective Green, g (s)	25.0	25.0	45.0	45.0	17.0	17.0
Actuated g/C Ratio	0.36	0.36	0.64	0.64	0.24	0.24
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)	653	555	933	1175	422	377
v/s Ratio Prot	0.04		c0.08	0.06	c0.16	
v/s Ratio Perm		0.07	c0.15			0.04
v/c Ratio	0.11	0.18	0.36	0.09	0.68	0.16
Uniform Delay, d1	15.1	15.5	6.0	4.7	24.0	20.9
Progression Factor	1.00	1.00	1.00	1.00	0.98	1.62
Incremental Delay, d2	0.4	0.7	0.2	0.1	4.2	0.2
Delay (s)	15.4	16.2	6.2	4.9	27.7	34.0
Level of Service	B	B	A	A	C	C
Approach Delay (s)	16.1			5.9	30.5	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: PM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2012 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1293	108
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					1405	117
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						153
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						166
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								166
C(m) (vph)								718
v/c								0.23
95% queue length								0.89
Control Delay								11.5
LOS								B
Approach Delay							11.5	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	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)	3367	2733	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	3471	3471	1553
Volume (vph)	485	222	222	1793	1298	351
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	527	241	241	1949	1411	382
RTOR Reduction (vph)	0	192	0	0	0	20
Lane Group Flow (vph)	527	49	241	1949	1411	362
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	22.2	22.2	14.5	85.8	65.3	87.5
Effective Green, g (s)	24.2	24.2	16.5	87.8	67.3	91.5
Actuated g/C Ratio	0.20	0.20	0.14	0.73	0.56	0.76
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)	679	551	463	2540	1947	1236
v/s Ratio Prot	c0.16		0.07	c0.56	0.41	0.06
v/s Ratio Perm		0.02				0.17
v/c Ratio	0.78	0.09	0.52	0.77	0.72	0.29
Uniform Delay, d1	45.3	38.9	48.1	9.9	19.5	4.4
Progression Factor	0.88	1.71	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	0.1	1.1	2.3	2.4	0.1
Delay (s)	45.1	66.8	49.1	12.1	21.9	4.5
Level of Service	D	E	D	B	C	A
Approach Delay (s)	51.9			16.2	18.2	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.39	1.00
Satd. Flow (perm)	1736	1553	1827	1553	705	1827
Volume (vph)	106	51	472	147	51	342
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	55	513	160	55	372
RTOR Reduction (vph)	0	39	0	69	0	0
Lane Group Flow (vph)	115	17	513	91	55	372
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.0	16.0	32.0	32.0	32.0	32.0
Effective Green, g (s)	18.0	18.0	34.0	34.0	34.0	34.0
Actuated g/C Ratio	0.30	0.30	0.57	0.57	0.57	0.57
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)	521	466	1035	880	400	1035
v/s Ratio Prot	c0.07		c0.28			0.20
v/s Ratio Perm		0.01		0.06	0.08	
v/c Ratio	0.22	0.04	0.50	0.10	0.14	0.36
Uniform Delay, d1	15.7	14.9	7.8	6.0	6.1	7.1
Progression Factor	1.05	1.26	1.00	1.00	0.70	0.90
Incremental Delay, d2	0.9	0.1	1.7	0.2	0.7	0.9
Delay (s)	17.4	18.8	9.5	6.2	4.9	7.3
Level of Service	B	B	A	A	A	A
Approach Delay (s)	17.8		8.7			7.0
Approach LOS	B		A			A

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	236	472	198	325	472	143
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	513	215	353	513	155
RTOR Reduction (vph)	0	181	0	270	0	0
Lane Group Flow (vph)	257	332	215	83	513	155
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	13.9	29.9	12.1	12.1	16.0	34.1
Effective Green, g (s)	15.9	33.9	14.1	14.1	18.0	36.1
Actuated g/C Ratio	0.26	0.56	0.24	0.24	0.30	0.60
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)	460	1726	816	642	1010	2088
v/s Ratio Prot	c0.15	0.05	c0.06		c0.15	0.04
v/s Ratio Perm		0.07		0.03		
v/c Ratio	0.56	0.19	0.26	0.13	0.51	0.07
Uniform Delay, d1	19.0	6.4	18.7	18.1	17.3	5.0
Progression Factor	0.96	0.64	0.64	1.07	0.81	0.74
Incremental Delay, d2	1.4	0.1	0.7	0.4	1.8	0.1
Delay (s)	19.7	4.1	12.7	19.7	15.8	3.8
Level of Service	B	A	B	B	B	A
Approach Delay (s)	9.3		17.0			13.0
Approach LOS	A		B			B

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.58	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1063	1827	1736	1553
Volume (vph)	96	263	222	69	263	306
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	286	241	75	286	333
RTOR Reduction (vph)	0	184	0	0	0	246
Lane Group Flow (vph)	104	102	241	75	286	87
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	19.5	19.5	34.4	34.4	13.6	13.6
Effective Green, g (s)	21.5	21.5	36.4	36.4	15.6	15.6
Actuated g/C Ratio	0.36	0.36	0.61	0.61	0.26	0.26
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)	655	556	767	1108	451	404
v/s Ratio Prot	0.06		c0.06	0.04	c0.16	
v/s Ratio Perm		0.07	c0.13			0.06
v/c Ratio	0.16	0.18	0.31	0.07	0.63	0.21
Uniform Delay, d1	13.1	13.2	5.6	4.8	19.7	17.4
Progression Factor	1.00	1.00	1.00	1.00	0.85	2.18
Incremental Delay, d2	0.5	0.7	0.2	0.1	2.8	0.3
Delay (s)	13.6	14.0	5.8	5.0	19.5	38.1
Level of Service	B	B	A	A	B	D
Approach Delay (s)	13.9			5.6	29.5	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2012 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1263	108
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					1372	117
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						153
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						166
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								166
C(m) (vph)								767
v/c								0.22
95% queue length								0.82
Control Delay								11.0
LOS								B
Approach Delay							11.0	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	0.91	0.91	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)	3367	2733	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	4988	4988	1553
Volume (vph)	351	222	222	1298	1793	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	241	241	1411	1949	527
RTOR Reduction (vph)	0	196	0	0	0	22
Lane Group Flow (vph)	382	45	241	1411	1949	505
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	9.3	9.3	5.4	38.7	27.3	36.6
Effective Green, g (s)	11.3	11.3	7.4	40.7	29.3	40.6
Actuated g/C Ratio	0.19	0.19	0.12	0.68	0.49	0.68
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)	634	515	415	3384	2436	1154
v/s Ratio Prot	c0.11		c0.07	0.28	c0.39	0.08
v/s Ratio Perm		0.02				0.24
v/c Ratio	0.60	0.09	0.58	0.42	0.80	0.44
Uniform Delay, d1	22.3	20.1	24.8	4.3	12.9	4.5
Progression Factor	0.39	0.28	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1	2.1	0.4	2.9	0.3
Delay (s)	10.2	5.7	26.9	4.7	15.8	4.7
Level of Service	B	A	C	A	B	A
Approach Delay (s)	8.4			7.9	13.4	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.49	1.00
Satd. Flow (perm)	1736	1553	1827	1553	896	1827
Volume (vph)	147	51	342	106	51	472
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	55	372	115	55	513
RTOR Reduction (vph)	0	38	0	52	0	0
Lane Group Flow (vph)	160	17	372	63	55	513
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	17.0	17.0	31.0	31.0	31.0	31.0
Effective Green, g (s)	19.0	19.0	33.0	33.0	33.0	33.0
Actuated g/C Ratio	0.32	0.32	0.55	0.55	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)	550	492	1005	854	493	1005
v/s Ratio Prot	c0.09		0.20			c0.28
v/s Ratio Perm		0.01		0.04	0.06	
v/c Ratio	0.29	0.04	0.37	0.07	0.11	0.51
Uniform Delay, d1	15.4	14.2	7.6	6.3	6.5	8.4
Progression Factor	0.75	0.52	1.00	1.00	0.41	0.38
Incremental Delay, d2	1.2	0.1	1.0	0.2	0.4	1.7
Delay (s)	12.7	7.4	8.7	6.5	3.1	4.9
Level of Service	B	A	A	A	A	A
Approach Delay (s)	11.4		8.2			4.8
Approach LOS	B		A			A

Intersection Summary			
HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	325	472	143	236	472	198
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	353	513	155	257	513	215
RTOR Reduction (vph)	0	206	0	205	0	0
Lane Group Flow (vph)	353	307	155	52	513	215
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	17.9	31.9	10.1	10.1	14.0	30.1
Effective Green, g (s)	19.9	35.9	12.1	12.1	16.0	32.1
Actuated g/C Ratio	0.33	0.60	0.20	0.20	0.27	0.54
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)	576	1817	700	551	898	1857
v/s Ratio Prot	c0.20	0.06	c0.04		c0.15	0.06
v/s Ratio Perm		0.06		0.02		
v/c Ratio	0.61	0.17	0.22	0.09	0.57	0.12
Uniform Delay, d1	16.8	5.4	20.0	19.5	19.0	6.9
Progression Factor	0.95	2.82	0.72	2.06	0.83	0.57
Incremental Delay, d2	1.8	0.0	0.7	0.3	2.5	0.1
Delay (s)	17.7	15.2	15.1	40.4	18.3	4.1
Level of Service	B	B	B	D	B	A
Approach Delay (s)	16.2		30.9			14.1
Approach LOS	B		C			B

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.59	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1079	1827	1736	1553
Volume (vph)	69	263	306	96	263	222
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	286	333	104	286	241
RTOR Reduction (vph)	0	190	0	0	0	177
Lane Group Flow (vph)	75	96	333	104	286	64
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	18.1	18.1	34.1	34.1	13.9	13.9
Effective Green, g (s)	20.1	20.1	36.1	36.1	15.9	15.9
Actuated g/C Ratio	0.34	0.34	0.60	0.60	0.26	0.26
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)	612	520	781	1099	460	412
v/s Ratio Prot	0.04		c0.09	0.06	c0.16	
v/s Ratio Perm		0.06	c0.17			0.04
v/c Ratio	0.12	0.18	0.43	0.09	0.62	0.16
Uniform Delay, d1	13.8	14.1	6.1	5.0	19.4	16.9
Progression Factor	1.00	1.00	1.00	1.00	0.69	0.50
Incremental Delay, d2	0.4	0.8	0.4	0.2	2.6	0.2
Delay (s)	14.2	14.9	6.4	5.2	16.0	8.6
Level of Service	B	B	A	A	B	A
Approach Delay (s)	14.8			6.2	12.6	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: PM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2012 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					861	108
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					935	117
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						153
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						166
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								166
C(m) (vph)								853
v/c								0.19
95% queue length								0.72
Control Delay								10.2
LOS								B
Approach Delay							10.2	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	0.91	0.91	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)	3367	2733	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	4988	4988	1553
Volume (vph)	485	222	222	1793	1298	351
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	527	241	241	1949	1411	382
RTOR Reduction (vph)	0	184	0	0	0	33
Lane Group Flow (vph)	527	57	241	1949	1411	349
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	12.3	12.3	6.2	35.7	23.5	35.8
Effective Green, g (s)	14.3	14.3	8.2	37.7	25.5	39.8
Actuated g/C Ratio	0.24	0.24	0.14	0.63	0.42	0.66
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)	802	651	460	3134	2120	1134
v/s Ratio Prot	c0.16		0.07	c0.39	0.28	0.07
v/s Ratio Perm		0.02				0.15
v/c Ratio	0.66	0.09	0.52	0.62	0.67	0.31
Uniform Delay, d1	20.6	17.8	24.1	6.8	13.8	4.3
Progression Factor	0.46	0.37	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1	1.1	0.9	1.7	0.2
Delay (s)	11.2	6.6	25.2	7.7	15.5	4.4
Level of Service	B	A	C	A	B	A
Approach Delay (s)	9.8			9.7	13.1	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.39	1.00
Satd. Flow (perm)	1736	1553	1827	1553	705	1827
Volume (vph)	106	51	472	147	51	342
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	55	513	160	55	372
RTOR Reduction (vph)	0	39	0	69	0	0
Lane Group Flow (vph)	115	17	513	91	55	372
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.0	16.0	32.0	32.0	32.0	32.0
Effective Green, g (s)	18.0	18.0	34.0	34.0	34.0	34.0
Actuated g/C Ratio	0.30	0.30	0.57	0.57	0.57	0.57
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)	521	466	1035	880	400	1035
v/s Ratio Prot	c0.07		c0.28			0.20
v/s Ratio Perm		0.01		0.06	0.08	
v/c Ratio	0.22	0.04	0.50	0.10	0.14	0.36
Uniform Delay, d1	15.7	14.9	7.8	6.0	6.1	7.1
Progression Factor	0.55	0.22	1.00	1.00	0.44	0.53
Incremental Delay, d2	0.9	0.1	1.7	0.2	0.7	0.9
Delay (s)	9.5	3.4	9.5	6.2	3.3	4.7
Level of Service	A	A	A	A	A	A
Approach Delay (s)	7.6		8.7			4.5
Approach LOS	A		A			A

Intersection Summary			
HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	236	472	198	325	472	143
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	513	215	353	513	155
RTOR Reduction (vph)	0	185	0	267	0	0
Lane Group Flow (vph)	257	328	215	86	513	155
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	13.3	29.3	12.7	12.7	16.0	34.7
Effective Green, g (s)	15.3	33.3	14.7	14.7	18.0	36.7
Actuated g/C Ratio	0.26	0.55	0.24	0.24	0.30	0.61
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)	443	1699	850	670	1010	2123
v/s Ratio Prot	c0.15	0.05	c0.06		c0.15	0.04
v/s Ratio Perm		0.07		0.03		
v/c Ratio	0.58	0.19	0.25	0.13	0.51	0.07
Uniform Delay, d1	19.5	6.7	18.2	17.7	17.3	4.7
Progression Factor	1.11	1.23	0.66	1.49	0.81	0.57
Incremental Delay, d2	1.9	0.1	0.6	0.4	1.8	0.1
Delay (s)	23.5	8.2	12.6	26.6	15.8	2.8
Level of Service	C	A	B	C	B	A
Approach Delay (s)	13.3		21.3			12.8
Approach LOS	B		C			B

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.58	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1066	1827	1736	1553
Volume (vph)	96	263	222	69	263	306
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	286	241	75	286	333
RTOR Reduction (vph)	0	181	0	0	0	249
Lane Group Flow (vph)	104	105	241	75	286	84
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	20.0	20.0	34.8	34.8	13.2	13.2
Effective Green, g (s)	22.0	22.0	36.8	36.8	15.2	15.2
Actuated g/C Ratio	0.37	0.37	0.61	0.61	0.25	0.25
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)	670	569	774	1121	440	393
v/s Ratio Prot	0.06		c0.06	0.04	c0.16	
v/s Ratio Perm		0.07	c0.13			0.05
v/c Ratio	0.16	0.18	0.31	0.07	0.65	0.21
Uniform Delay, d1	12.8	12.9	5.4	4.7	20.0	17.7
Progression Factor	1.00	1.00	1.00	1.00	0.75	0.64
Incremental Delay, d2	0.5	0.7	0.2	0.1	3.3	0.3
Delay (s)	13.3	13.6	5.6	4.8	18.3	11.6
Level of Service	B	B	A	A	B	B
Approach Delay (s)	13.5			5.4	14.7	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					2826	191
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					3071	207
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						268
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						291
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								291
C(m) (vph)								249
v/c								1.17
95% queue length								13.40
Control Delay								152.5
LOS								F
Approach Delay							152.5	
Approach LOS							F	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	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)	3367	2733	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	3471	3471	1553
Volume (vph)	508	457	457	1857	2565	702
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	552	497	497	2018	2788	763
RTOR Reduction (vph)	0	241	0	0	0	1
Lane Group Flow (vph)	552	256	497	2018	2788	762
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	17.0	17.0	15.0	111.0	90.0	107.0
Effective Green, g (s)	19.0	19.0	17.0	113.0	92.0	111.0
Actuated g/C Ratio	0.14	0.14	0.12	0.81	0.66	0.79
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)	457	371	409	2802	2281	1276
v/s Ratio Prot	c0.16		c0.15	0.58	c0.80	0.08
v/s Ratio Perm		0.09				0.41
v/c Ratio	1.21	0.69	1.22	0.72	1.22	0.60
Uniform Delay, d1	60.5	57.7	61.5	6.2	24.0	5.7
Progression Factor	0.56	0.73	1.00	1.00	1.00	1.00
Incremental Delay, d2	107.1	3.6	117.3	1.6	104.2	0.8
Delay (s)	140.9	45.5	178.8	7.9	128.2	6.5
Level of Service	F	D	F	A	F	A
Approach Delay (s)	95.7			41.6	102.0	
Approach LOS	F			D	F	

Intersection Summary			
HCM Average Control Delay	79.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.36	1.00
Satd. Flow (perm)	1736	1553	1827	1553	654	1827
Volume (vph)	230	121	504	166	121	695
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	132	548	180	132	755
RTOR Reduction (vph)	0	90	0	68	0	0
Lane Group Flow (vph)	250	42	548	112	132	755
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	43.0	43.0	85.0	85.0	85.0	85.0
Effective Green, g (s)	45.0	45.0	87.0	87.0	87.0	87.0
Actuated g/C Ratio	0.32	0.32	0.62	0.62	0.62	0.62
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)	558	499	1135	965	406	1135
v/s Ratio Prot	c0.14		0.30			c0.41
v/s Ratio Perm		0.03		0.07	0.20	
v/c Ratio	0.45	0.09	0.48	0.12	0.33	0.67
Uniform Delay, d1	37.7	33.1	14.3	10.8	12.6	17.1
Progression Factor	0.84	0.67	1.00	1.00	0.22	0.22
Incremental Delay, d2	2.0	0.3	1.5	0.2	1.7	2.5
Delay (s)	33.8	22.5	15.8	11.1	4.5	6.2
Level of Service	C	C	B	B	A	A
Approach Delay (s)	29.9		14.6			6.0
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	581	753	171	420	753	236
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	632	818	186	457	818	257
RTOR Reduction (vph)	0	61	0	398	0	0
Lane Group Flow (vph)	632	757	186	59	818	257
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	64.6	106.0	16.0	16.0	41.4	63.4
Effective Green, g (s)	66.6	110.0	18.0	18.0	43.4	65.4
Actuated g/C Ratio	0.48	0.79	0.13	0.13	0.31	0.47
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)	826	2225	446	351	1044	1621
v/s Ratio Prot	c0.36	0.16	c0.05		c0.24	0.07
v/s Ratio Perm		0.12		0.02		
v/c Ratio	0.77	0.34	0.42	0.17	0.78	0.16
Uniform Delay, d1	30.3	4.4	56.2	54.3	44.0	21.5
Progression Factor	0.66	0.44	0.82	2.86	0.81	0.92
Incremental Delay, d2	2.9	0.1	2.6	0.9	5.3	0.2
Delay (s)	22.8	2.0	48.8	156.5	40.9	19.9
Level of Service	C	A	D	F	D	B
Approach Delay (s)	11.1		125.3			35.8
Approach LOS	B		F			D

Intersection Summary			
HCM Average Control Delay	42.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.62	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1129	1827	1736	1553
Volume (vph)	102	393	447	140	393	323
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	427	486	152	427	351
RTOR Reduction (vph)	0	263	0	0	0	237
Lane Group Flow (vph)	111	164	486	152	427	114
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	51.7	51.7	84.6	84.6	43.4	43.4
Effective Green, g (s)	53.7	53.7	86.6	86.6	45.4	45.4
Actuated g/C Ratio	0.38	0.38	0.62	0.62	0.32	0.32
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)	701	596	824	1130	563	504
v/s Ratio Prot	0.06		c0.12	0.08	c0.25	
v/s Ratio Perm		0.11	c0.24			0.07
v/c Ratio	0.16	0.27	0.59	0.13	0.76	0.23
Uniform Delay, d1	28.3	29.7	14.3	11.1	42.4	34.5
Progression Factor	1.00	1.00	1.00	1.00	1.06	2.75
Incremental Delay, d2	0.5	1.1	1.1	0.2	5.5	0.2
Delay (s)	28.8	30.9	15.4	11.4	50.6	95.2
Level of Service	C	C	B	B	D	F
Approach Delay (s)	30.4			14.5	70.7	
Approach LOS	C			B	E	

Intersection Summary			
HCM Average Control Delay	41.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: PM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1908	191
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					2073	207
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						268
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						291
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								291
C(m) (vph)								534
v/c								0.54
95% queue length								3.25
Control Delay								19.5
LOS								C
Approach Delay							19.5	
Approach LOS							C	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	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)	3367	2733	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	3471	3471	1553
Volume (vph)	702	457	457	2565	1857	508
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	763	497	497	2788	2018	552
RTOR Reduction (vph)	0	297	0	0	0	2
Lane Group Flow (vph)	763	200	497	2788	2018	550
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	27.0	27.0	18.0	101.0	77.0	104.0
Effective Green, g (s)	29.0	29.0	20.0	103.0	79.0	108.0
Actuated g/C Ratio	0.21	0.21	0.14	0.74	0.56	0.77
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)	697	566	481	2554	1959	1242
v/s Ratio Prot	c0.23		0.15	c0.80	0.58	0.09
v/s Ratio Perm		0.07				0.26
v/c Ratio	1.09	0.35	1.03	1.09	1.03	0.44
Uniform Delay, d1	55.5	47.5	60.0	18.5	30.5	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.9	0.4	49.9	48.4	28.5	0.3
Delay (s)	118.4	47.9	109.9	66.9	59.0	5.8
Level of Service	F	D	F	E	E	A
Approach Delay (s)	90.5			73.4	47.6	
Approach LOS	F			E	D	

Intersection Summary			
HCM Average Control Delay	67.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1736	1553	1827	1553	457	1827
Volume (vph)	166	121	695	230	121	504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	132	755	250	132	548
RTOR Reduction (vph)	0	95	0	89	0	0
Lane Group Flow (vph)	180	37	755	161	132	548
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	29.0	29.0	69.0	69.0	69.0	69.0
Effective Green, g (s)	31.0	31.0	71.0	71.0	71.0	71.0
Actuated g/C Ratio	0.28	0.28	0.65	0.65	0.65	0.65
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)	489	438	1179	1002	295	1179
v/s Ratio Prot	c0.10		c0.41			0.30
v/s Ratio Perm		0.02		0.10	0.29	
v/c Ratio	0.37	0.08	0.64	0.16	0.45	0.46
Uniform Delay, d1	31.7	29.1	11.8	7.7	9.7	9.9
Progression Factor	1.00	1.00	1.00	1.00	0.36	0.31
Incremental Delay, d2	2.1	0.4	2.7	0.3	4.1	1.1
Delay (s)	33.8	29.4	14.5	8.1	7.5	4.1
Level of Service	C	C	B	A	A	A
Approach Delay (s)	31.9		12.9			4.8
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	420	753	236	581	753	171
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	818	257	632	818	186
RTOR Reduction (vph)	0	87	0	517	0	0
Lane Group Flow (vph)	457	731	257	115	818	186
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	34.2	74.0	18.0	18.0	39.8	63.8
Effective Green, g (s)	36.2	78.0	20.0	20.0	41.8	65.8
Actuated g/C Ratio	0.33	0.71	0.18	0.18	0.38	0.60
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)	571	2037	631	497	1279	2076
v/s Ratio Prot	c0.26	0.12	c0.07		c0.24	0.05
v/s Ratio Perm		0.15		0.04		
v/c Ratio	0.80	0.36	0.41	0.23	0.64	0.09
Uniform Delay, d1	33.6	6.2	39.8	38.4	27.9	9.4
Progression Factor	1.00	1.00	0.75	1.37	0.91	0.69
Incremental Delay, d2	7.9	0.1	1.6	0.9	2.3	0.1
Delay (s)	41.5	6.4	31.3	53.6	27.7	6.5
Level of Service	D	A	C	D	C	A
Approach Delay (s)	19.0		47.1			23.8
Approach LOS	B		D			C

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1047	1827	1736	1553
Volume (vph)	140	393	323	102	393	447
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	427	351	111	427	486
RTOR Reduction (vph)	0	261	0	0	0	325
Lane Group Flow (vph)	152	166	351	111	427	161
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	40.8	40.8	63.6	63.6	34.4	34.4
Effective Green, g (s)	42.8	42.8	65.6	65.6	36.4	36.4
Actuated g/C Ratio	0.39	0.39	0.60	0.60	0.33	0.33
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)	711	604	742	1090	574	514
v/s Ratio Prot	0.08		c0.08	0.06	c0.25	
v/s Ratio Perm		0.11	c0.20			0.10
v/c Ratio	0.21	0.28	0.47	0.10	0.74	0.31
Uniform Delay, d1	22.4	23.0	11.5	9.5	32.7	27.5
Progression Factor	1.00	1.00	1.00	1.00	0.82	0.11
Incremental Delay, d2	0.7	1.1	0.5	0.2	4.9	0.3
Delay (s)	23.1	24.1	12.0	9.7	31.6	3.4
Level of Service	C	C	B	A	C	A
Approach Delay (s)	23.8			11.4	16.6	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1387	191
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					1507	207
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						268
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						291
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								291
C(m) (vph)								756
v/c								0.38
95% queue length								1.82
Control Delay								12.7
LOS								B
Approach Delay							12.7	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	0.91	0.91	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)	3367	2733	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	4988	4988	1553
Volume (vph)	508	457	457	1857	2565	702
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	552	497	497	2018	2788	763
RTOR Reduction (vph)	0	299	0	0	0	3
Lane Group Flow (vph)	552	198	497	2018	2788	760
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	13.0	13.0	11.0	65.0	48.0	61.0
Effective Green, g (s)	15.0	15.0	13.0	67.0	50.0	65.0
Actuated g/C Ratio	0.17	0.17	0.14	0.74	0.56	0.72
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)	561	456	486	3713	2771	1191
v/s Ratio Prot	c0.16		c0.15	0.40	c0.56	0.11
v/s Ratio Perm		0.07				0.38
v/c Ratio	0.98	0.43	1.02	0.54	1.01	0.64
Uniform Delay, d1	37.4	33.7	38.5	4.9	20.0	6.4
Progression Factor	0.63	0.36	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.2	0.4	46.7	0.6	18.6	1.1
Delay (s)	49.8	12.4	85.2	5.5	38.6	7.6
Level of Service	D	B	F	A	D	A
Approach Delay (s)	32.1			21.3	31.9	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.37	1.00
Satd. Flow (perm)	1736	1553	1827	1553	676	1827
Volume (vph)	230	121	504	166	121	695
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	132	548	180	132	755
RTOR Reduction (vph)	0	94	0	68	0	0
Lane Group Flow (vph)	250	38	548	112	132	755
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	24.0	24.0	54.0	54.0	54.0	54.0
Effective Green, g (s)	26.0	26.0	56.0	56.0	56.0	56.0
Actuated g/C Ratio	0.29	0.29	0.62	0.62	0.62	0.62
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)	502	449	1137	966	421	1137
v/s Ratio Prot	c0.14		0.30			c0.41
v/s Ratio Perm		0.02		0.07	0.20	
v/c Ratio	0.50	0.08	0.48	0.12	0.31	0.66
Uniform Delay, d1	26.6	23.3	9.2	6.9	8.0	10.9
Progression Factor	0.81	0.60	1.00	1.00	0.27	0.24
Incremental Delay, d2	3.0	0.3	1.5	0.2	1.5	2.4
Delay (s)	24.6	14.4	10.6	7.2	3.7	5.0
Level of Service	C	B	B	A	A	A
Approach Delay (s)	21.0		9.8			4.8
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	581	753	171	420	753	236
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	632	818	186	457	818	257
RTOR Reduction (vph)	0	66	0	401	0	0
Lane Group Flow (vph)	632	752	186	56	818	257
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	38.5	63.0	9.0	9.0	24.5	39.5
Effective Green, g (s)	40.5	67.0	11.0	11.0	26.5	41.5
Actuated g/C Ratio	0.45	0.74	0.12	0.12	0.29	0.46
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)	781	2156	424	334	991	1601
v/s Ratio Prot	c0.36	0.16	c0.05		c0.24	0.07
v/s Ratio Perm		0.12		0.02		
v/c Ratio	0.81	0.35	0.44	0.17	0.83	0.16
Uniform Delay, d1	21.4	4.0	36.6	35.4	29.6	14.1
Progression Factor	0.86	0.48	0.81	0.80	0.80	0.67
Incremental Delay, d2	4.5	0.1	3.0	1.0	7.0	0.2
Delay (s)	22.9	2.0	32.7	29.4	30.7	9.7
Level of Service	C	A	C	C	C	A
Approach Delay (s)	11.1		30.4			25.7
Approach LOS	B		C			C

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.60	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1105	1827	1736	1553
Volume (vph)	102	393	447	140	393	323
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	427	486	152	427	351
RTOR Reduction (vph)	0	285	0	0	0	243
Lane Group Flow (vph)	111	142	486	152	427	108
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	28.0	28.0	52.4	52.4	25.6	25.6
Effective Green, g (s)	30.0	30.0	54.4	54.4	27.6	27.6
Actuated g/C Ratio	0.33	0.33	0.60	0.60	0.31	0.31
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)	609	518	811	1104	532	476
v/s Ratio Prot	0.06		c0.14	0.08	c0.25	
v/s Ratio Perm		0.09	c0.23			0.07
v/c Ratio	0.18	0.27	0.60	0.14	0.80	0.23
Uniform Delay, d1	21.3	22.0	9.9	7.7	28.7	23.2
Progression Factor	1.00	1.00	1.00	1.00	0.91	1.59
Incremental Delay, d2	0.7	1.3	1.2	0.3	8.1	0.2
Delay (s)	22.0	23.3	11.1	7.9	34.2	37.2
Level of Service	C	C	B	A	C	D
Approach Delay (s)	23.0			10.4	35.5	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: PM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Interim
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1272	191
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					1382	207
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						268
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						291
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								291
C(m) (vph)								744
v/c								0.39
95% queue length								1.87
Control Delay								12.9
LOS								B
Approach Delay							12.9	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	0.91	0.91	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)	3367	2733	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	4988	4988	1553
Volume (vph)	702	457	457	2565	1857	508
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	763	497	497	2788	2018	552
RTOR Reduction (vph)	0	367	0	0	0	8
Lane Group Flow (vph)	763	130	497	2788	2018	544
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	34.6	34.6	23.0	93.4	64.4	99.0
Effective Green, g (s)	36.6	36.6	25.0	95.4	66.4	103.0
Actuated g/C Ratio	0.26	0.26	0.18	0.68	0.47	0.74
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)	880	714	601	3399	2366	1187
v/s Ratio Prot	c0.23		0.15	c0.56	c0.40	0.12
v/s Ratio Perm		0.05				0.23
v/c Ratio	0.87	0.18	0.83	0.82	0.85	0.46
Uniform Delay, d1	49.4	40.1	55.4	16.1	32.5	7.4
Progression Factor	1.11	3.12	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.1	9.1	2.3	4.2	0.3
Delay (s)	61.2	125.1	64.5	18.5	36.6	7.7
Level of Service	E	F	E	B	D	A
Approach Delay (s)	86.4			25.4	30.4	
Approach LOS	F			C	C	

Intersection Summary			
HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1736	1553	1827	1553	460	1827
Volume (vph)	166	121	695	230	121	504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	132	755	250	132	548
RTOR Reduction (vph)	0	98	0	93	0	0
Lane Group Flow (vph)	180	34	755	157	132	548
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.0	16.0	42.0	42.0	42.0	42.0
Effective Green, g (s)	18.0	18.0	44.0	44.0	44.0	44.0
Actuated g/C Ratio	0.26	0.26	0.63	0.63	0.63	0.63
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)	446	399	1148	976	289	1148
v/s Ratio Prot	c0.10		c0.41			0.30
v/s Ratio Perm		0.02		0.10	0.29	
v/c Ratio	0.40	0.09	0.66	0.16	0.46	0.48
Uniform Delay, d1	21.6	19.7	8.2	5.4	6.8	6.9
Progression Factor	0.97	1.51	1.00	1.00	0.60	0.58
Incremental Delay, d2	2.3	0.4	3.0	0.4	4.4	1.2
Delay (s)	23.2	30.2	11.2	5.7	8.5	5.2
Level of Service	C	C	B	A	A	A
Approach Delay (s)	26.2		9.8			5.9
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	420	753	236	581	753	171
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	818	257	632	818	186
RTOR Reduction (vph)	0	92	0	522	0	0
Lane Group Flow (vph)	457	726	257	110	818	186
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	22.8	41.8	10.2	10.2	19.0	35.2
Effective Green, g (s)	24.8	45.8	12.2	12.2	21.0	37.2
Actuated g/C Ratio	0.35	0.65	0.17	0.17	0.30	0.53
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)	615	1944	605	476	1010	1845
v/s Ratio Prot	c0.26	0.13	c0.07		c0.24	0.05
v/s Ratio Perm		0.13		0.04		
v/c Ratio	0.74	0.37	0.42	0.23	0.81	0.10
Uniform Delay, d1	19.8	5.5	25.8	24.9	22.7	8.1
Progression Factor	0.86	1.04	0.75	3.87	0.81	0.58
Incremental Delay, d2	4.2	0.1	1.8	0.9	6.5	0.1
Delay (s)	21.2	5.8	21.0	97.1	24.8	4.8
Level of Service	C	A	C	F	C	A
Approach Delay (s)	11.3		75.1			21.1
Approach LOS	B		E			C

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.55	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1009	1827	1736	1553
Volume (vph)	140	393	323	102	393	447
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	427	351	111	427	486
RTOR Reduction (vph)	0	289	0	0	0	324
Lane Group Flow (vph)	152	138	351	111	427	162
Turn Type		Perm	pm+pt			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	20.7	20.7	36.6	36.6	21.4	21.4
Effective Green, g (s)	22.7	22.7	38.6	38.6	23.4	23.4
Actuated g/C Ratio	0.32	0.32	0.55	0.55	0.33	0.33
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)	592	504	680	1007	580	519
v/s Ratio Prot	0.08		c0.09	0.06	c0.25	
v/s Ratio Perm		0.09	c0.20			0.10
v/c Ratio	0.26	0.27	0.52	0.11	0.74	0.31
Uniform Delay, d1	17.4	17.5	9.0	7.5	20.6	17.3
Progression Factor	1.00	1.00	1.00	1.00	0.93	3.36
Incremental Delay, d2	1.0	1.3	0.7	0.2	4.5	0.3
Delay (s)	18.5	18.9	9.7	7.7	23.6	58.5
Level of Service	B	B	A	A	C	E
Approach Delay (s)	18.8			9.2	42.2	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Full Buildout
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					2775	115
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					3016	124
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						166
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						180
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								180
C(m) (vph)								314
v/c								0.57
95% queue length								3.36
Control Delay								30.8
LOS								D
Approach Delay							30.8	
Approach LOS							D	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	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)	3367	2733	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	3471	3471	1553
Volume (vph)	351	245	245	1885	2603	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	266	266	2049	2829	527
RTOR Reduction (vph)	0	140	0	0	0	1
Lane Group Flow (vph)	382	126	266	2049	2829	526
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	17.0	17.0	11.0	151.0	134.0	151.0
Effective Green, g (s)	19.0	19.0	13.0	153.0	136.0	155.0
Actuated g/C Ratio	0.11	0.11	0.07	0.85	0.76	0.86
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)	355	288	243	2950	2623	1372
v/s Ratio Prot	c0.11		c0.08	0.59	c0.82	0.04
v/s Ratio Perm		0.05				0.30
v/c Ratio	1.08	0.44	1.09	0.69	1.08	0.38
Uniform Delay, d1	80.5	75.5	83.5	4.9	22.0	2.6
Progression Factor	0.90	0.82	1.00	1.00	0.28	0.02
Incremental Delay, d2	67.4	1.0	85.3	1.4	36.2	0.0
Delay (s)	140.0	62.7	168.8	6.3	42.4	0.1
Level of Service	F	E	F	A	D	A
Approach Delay (s)	108.2			25.0	35.7	
Approach LOS	F			C	D	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.35	1.00
Satd. Flow (perm)	1736	1553	1827	1553	635	1827
Volume (vph)	115	115	591	83	115	817
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	125	642	90	125	888
RTOR Reduction (vph)	0	99	0	27	0	0
Lane Group Flow (vph)	125	26	642	63	125	888
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	17.0	17.0	61.0	61.0	61.0	61.0
Effective Green, g (s)	19.0	19.0	63.0	63.0	63.0	63.0
Actuated g/C Ratio	0.21	0.21	0.70	0.70	0.70	0.70
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)	366	328	1279	1087	445	1279
v/s Ratio Prot	c0.07		0.35			c0.49
v/s Ratio Perm		0.02		0.04	0.20	
v/c Ratio	0.34	0.08	0.50	0.06	0.28	0.69
Uniform Delay, d1	30.2	28.5	6.2	4.2	5.0	7.9
Progression Factor	0.99	1.25	1.00	1.00	0.43	0.59
Incremental Delay, d2	2.2	0.4	1.4	0.1	1.4	2.8
Delay (s)	32.0	35.9	7.7	4.3	3.6	7.4
Level of Service	C	D	A	A	A	A
Approach Delay (s)	34.0		7.2			6.9
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	10.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	447	376	351	323	376	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	486	409	382	351	409	527
RTOR Reduction (vph)	0	50	0	281	0	0
Lane Group Flow (vph)	486	359	382	70	409	527
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	34.6	56.0	16.0	16.0	21.4	43.4
Effective Green, g (s)	36.6	60.0	18.0	18.0	23.4	45.4
Actuated g/C Ratio	0.41	0.67	0.20	0.20	0.26	0.50
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)	706	1943	694	547	875	1751
v/s Ratio Prot	c0.28	0.08	c0.11		c0.12	0.15
v/s Ratio Perm		0.06		0.03		
v/c Ratio	0.69	0.18	0.55	0.13	0.47	0.30
Uniform Delay, d1	22.0	5.7	32.4	29.6	28.1	13.0
Progression Factor	0.77	0.58	0.85	0.44	0.77	0.60
Incremental Delay, d2	2.4	0.0	2.8	0.4	1.7	0.4
Delay (s)	19.3	3.4	30.2	13.4	23.3	8.2
Level of Service	B	A	C	B	C	A
Approach Delay (s)	12.0		22.1			14.8
Approach LOS	B		C			B

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	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)	1736	3471	1553	1736	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.66	1.00	1.00	0.66	1.00	1.00	0.48	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	1198	3471	1553	1204	3471	1553	868	3471	1553	748	3471	1553
Volume (vph)	134	102	259	160	140	293	259	249	116	293	345	185
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)	146	111	282	174	152	318	282	271	126	318	375	201
RTOR Reduction (vph)	0	0	200	0	0	223	0	0	104	0	0	159
Lane Group Flow (vph)	146	111	82	174	152	95	282	271	22	318	375	42
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	32.8	24.1	24.1	34.6	25.0	25.0	29.1	13.5	13.5	35.5	16.7	16.7
Effective Green, g (s)	36.8	26.1	26.1	38.6	27.0	27.0	33.1	15.5	15.5	39.5	18.7	18.7
Actuated g/C Ratio	0.41	0.29	0.29	0.43	0.30	0.30	0.37	0.17	0.17	0.44	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	554	1007	450	585	1041	466	489	598	267	557	721	323
v/s Ratio Prot	0.03	0.03		c0.04	0.04		0.11	0.08		c0.13	0.11	
v/s Ratio Perm	0.08		0.05	c0.09		0.06	0.10		0.01	c0.12		0.03
v/c Ratio	0.26	0.11	0.18	0.30	0.15	0.20	0.58	0.45	0.08	0.57	0.52	0.13
Uniform Delay, d1	17.2	23.4	23.9	16.3	23.1	23.5	21.5	33.4	31.3	17.6	31.7	29.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.88	2.47	0.89	0.97	2.26
Incremental Delay, d2	0.3	0.2	0.9	0.3	0.3	1.0	1.6	0.5	0.1	1.2	0.6	0.2
Delay (s)	17.4	23.7	24.8	16.6	23.4	24.5	16.9	30.0	77.4	16.9	31.2	65.8
Level of Service	B	C	C	B	C	C	B	C	E	B	C	E
Approach Delay (s)		22.6			22.1			33.3			33.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.97	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)	3367	1553	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	1553	3367	3471	3471	1553
Volume (vph)	356	240	240	2097	2897	491
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	387	261	261	2279	3149	534
RTOR Reduction (vph)	0	70	0	0	0	1
Lane Group Flow (vph)	387	191	261	2279	3149	533
Turn Type		Perm	Prot			custom
Protected Phases	4		5	2	6	6
Permitted Phases		4				4
Actuated Green, G (s)	16.0	16.0	10.0	152.0	136.0	152.0
Effective Green, g (s)	18.0	18.0	12.0	154.0	138.0	156.0
Actuated g/C Ratio	0.10	0.10	0.07	0.86	0.77	0.87
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)	337	155	224	2970	2661	1380
v/s Ratio Prot	0.11		c0.08	0.66	c0.91	0.30
v/s Ratio Perm		c0.12				0.05
v/c Ratio	1.15	1.23	1.17	0.77	1.18	0.39
Uniform Delay, d1	81.0	81.0	84.0	5.5	21.0	2.4
Progression Factor	1.14	1.23	1.08	0.70	1.00	1.00
Incremental Delay, d2	93.9	145.0	102.2	1.3	86.7	0.2
Delay (s)	186.2	244.3	192.7	5.2	107.7	2.6
Level of Service	F	F	F	A	F	A
Approach Delay (s)	209.6			24.4	92.4	
Approach LOS	F			C	F	

Intersection Summary			
HCM Average Control Delay	78.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: PM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Full Buildout
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1927	115
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					2094	124
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						166
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						180
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								180
C(m) (vph)								537
v/c								0.34
95% queue length								1.46
Control Delay								15.0+
LOS								C
Approach Delay							15.0+	
Approach LOS							C	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	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)	3367	2733	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	3471	3471	1553
Volume (vph)	485	245	245	2603	1885	351
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	527	266	266	2829	2049	382
RTOR Reduction (vph)	0	210	0	0	0	6
Lane Group Flow (vph)	527	56	266	2829	2049	376
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	18.0	18.0	11.0	100.0	83.0	101.0
Effective Green, g (s)	20.0	20.0	13.0	102.0	85.0	105.0
Actuated g/C Ratio	0.15	0.15	0.10	0.78	0.65	0.81
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)	518	420	337	2723	2270	1302
v/s Ratio Prot	c0.16		0.08	c0.82	0.59	0.04
v/s Ratio Perm		0.02				0.20
v/c Ratio	1.02	0.13	0.79	1.04	0.90	0.29
Uniform Delay, d1	55.0	47.5	57.2	14.0	19.0	3.1
Progression Factor	1.00	1.00	1.00	1.00	0.30	0.05
Incremental Delay, d2	44.0	0.1	11.6	28.4	2.3	0.0
Delay (s)	99.0	47.7	68.8	42.4	8.0	0.2
Level of Service	F	D	E	D	A	A
Approach Delay (s)	81.8			44.7	6.7	
Approach LOS	F			D	A	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.22	1.00
Satd. Flow (perm)	1736	1553	1827	1553	410	1827
Volume (vph)	83	115	817	115	115	591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	125	888	125	125	642
RTOR Reduction (vph)	0	102	0	37	0	0
Lane Group Flow (vph)	90	23	888	88	125	642
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	12.0	12.0	51.0	51.0	51.0	51.0
Effective Green, g (s)	14.0	14.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.19	0.19	0.71	0.71	0.71	0.71
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)	324	290	1291	1097	290	1291
v/s Ratio Prot	c0.05		c0.49			0.35
v/s Ratio Perm		0.02		0.06	0.30	
v/c Ratio	0.28	0.08	0.69	0.08	0.43	0.50
Uniform Delay, d1	26.2	25.2	6.3	3.4	4.6	5.0
Progression Factor	1.00	1.00	1.00	1.00	0.96	0.97
Incremental Delay, d2	2.1	0.5	3.0	0.1	4.3	1.3
Delay (s)	28.3	25.7	9.3	3.6	8.7	6.1
Level of Service	C	C	A	A	A	A
Approach Delay (s)	26.8		8.6			6.5
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	323	376	485	447	376	351
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	351	409	527	486	409	382
RTOR Reduction (vph)	0	48	0	335	0	0
Lane Group Flow (vph)	351	361	527	151	409	382
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	19.7	35.7	21.3	21.3	16.0	43.3
Effective Green, g (s)	21.7	39.7	23.3	23.3	18.0	45.3
Actuated g/C Ratio	0.29	0.53	0.31	0.31	0.24	0.60
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)	502	1592	1078	849	808	2096
v/s Ratio Prot	c0.20	0.07	c0.15		c0.12	0.11
v/s Ratio Perm		0.07		0.06		
v/c Ratio	0.70	0.23	0.49	0.18	0.51	0.18
Uniform Delay, d1	23.7	9.4	21.0	18.9	24.7	6.6
Progression Factor	1.00	1.00	0.76	2.21	0.88	0.57
Incremental Delay, d2	4.2	0.1	1.2	0.3	2.2	0.2
Delay (s)	28.0	9.5	17.3	42.0	24.0	4.0
Level of Service	C	A	B	D	C	A
Approach Delay (s)	18.0		29.1			14.3
Approach LOS	B		C			B

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	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)	1736	3471	1553	1736	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.59	1.00	1.00	0.66	1.00	1.00	0.58	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	1087	3471	1553	1198	3471	1553	1069	3471	1553	664	3471	1553
Volume (vph)	185	140	259	116	102	293	259	345	160	293	249	134
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)	201	152	282	126	111	318	282	375	174	318	271	146
RTOR Reduction (vph)	0	0	197	0	0	234	0	0	141	0	0	116
Lane Group Flow (vph)	201	152	85	126	111	84	282	375	33	318	271	30
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	27.8	20.7	20.7	22.0	17.8	17.8	24.7	12.2	12.2	27.5	13.6	13.6
Effective Green, g (s)	31.8	22.7	22.7	26.0	19.8	19.8	28.7	14.2	14.2	31.5	15.6	15.6
Actuated g/C Ratio	0.42	0.30	0.30	0.35	0.26	0.26	0.38	0.19	0.19	0.42	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	540	1051	470	460	916	410	538	657	294	506	722	323
v/s Ratio Prot	c0.05	0.04		0.02	0.03		0.10	0.11		c0.13	0.08	
v/s Ratio Perm	c0.11		0.05	0.07		0.05	0.10		0.02	c0.13		0.02
v/c Ratio	0.37	0.14	0.18	0.27	0.12	0.20	0.52	0.57	0.11	0.63	0.38	0.09
Uniform Delay, d1	14.1	19.1	19.3	17.3	21.0	21.5	17.1	27.6	25.2	15.7	25.5	24.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.21	1.18	2.72	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.3	0.8	0.3	0.3	1.1	0.9	1.1	0.2	2.4	0.3	0.1
Delay (s)	14.6	19.4	20.1	17.6	21.3	22.6	21.5	33.7	68.6	18.1	25.8	24.1
Level of Service	B	B	C	B	C	C	C	C	E	B	C	C
Approach Delay (s)		18.2			21.2			36.9			22.2	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.97	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)	3367	1553	3367	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	1553	3367	3471	3471	1553
Volume (vph)	491	240	240	2897	2097	356
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	534	261	261	3149	2279	387
RTOR Reduction (vph)	0	97	0	0	0	3
Lane Group Flow (vph)	534	164	261	3149	2279	384
Turn Type		Perm	Prot			custom
Protected Phases	4		5	2	6	6
Permitted Phases		4				4
Actuated Green, G (s)	16.0	16.0	9.0	102.0	87.0	103.0
Effective Green, g (s)	18.0	18.0	11.0	104.0	89.0	107.0
Actuated g/C Ratio	0.14	0.14	0.08	0.80	0.68	0.82
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)	466	215	285	2777	2376	1326
v/s Ratio Prot	c0.16		0.08	c0.91	0.66	0.20
v/s Ratio Perm		0.11				0.05
v/c Ratio	1.15	0.76	0.92	1.13	0.96	0.29
Uniform Delay, d1	56.0	53.9	59.0	13.0	18.8	2.7
Progression Factor	1.00	1.00	0.95	0.92	1.00	1.00
Incremental Delay, d2	88.2	14.7	4.7	60.8	11.1	0.1
Delay (s)	144.2	68.6	60.6	72.7	29.9	2.8
Level of Service	F	E	E	E	C	A
Approach Delay (s)	119.4			71.7	26.0	
Approach LOS	F			E	C	

Intersection Summary			
HCM Average Control Delay	59.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Full Buildout
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1848	115
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					2008	124
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						166
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						180
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								180
C(m) (vph)								578
v/c								0.31
95% queue length								1.32
Control Delay								14.0
LOS								B
Approach Delay							14.0	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	0.91	0.91	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)	3367	2733	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	4988	4988	1553
Volume (vph)	351	245	245	1885	2603	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	266	266	2049	2829	527
RTOR Reduction (vph)	0	192	0	0	0	7
Lane Group Flow (vph)	382	74	266	2049	2829	520
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	12.0	12.0	8.0	76.0	62.0	74.0
Effective Green, g (s)	14.0	14.0	10.0	78.0	64.0	78.0
Actuated g/C Ratio	0.14	0.14	0.10	0.78	0.64	0.78
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)	471	383	337	3891	3192	1273
v/s Ratio Prot	c0.11		c0.08	0.41	c0.57	0.06
v/s Ratio Perm		0.03				0.28
v/c Ratio	0.81	0.19	0.79	0.53	0.89	0.41
Uniform Delay, d1	41.7	38.0	44.0	4.1	15.0	3.6
Progression Factor	0.64	0.83	1.00	1.00	0.27	0.08
Incremental Delay, d2	9.4	0.2	11.6	0.5	1.0	0.0
Delay (s)	35.9	31.9	55.6	4.6	5.0	0.3
Level of Service	D	C	E	A	A	A
Approach Delay (s)	34.3			10.5	4.3	
Approach LOS	C			B	A	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.35	1.00
Satd. Flow (perm)	1736	1553	1827	1553	638	1827
Volume (vph)	115	115	591	83	115	817
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	125	642	90	125	888
RTOR Reduction (vph)	0	99	0	26	0	0
Lane Group Flow (vph)	125	26	642	64	125	888
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	19.0	19.0	69.0	69.0	69.0	69.0
Effective Green, g (s)	21.0	21.0	71.0	71.0	71.0	71.0
Actuated g/C Ratio	0.21	0.21	0.71	0.71	0.71	0.71
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)	365	326	1297	1103	453	1297
v/s Ratio Prot	c0.07		0.35			c0.49
v/s Ratio Perm		0.02		0.04	0.20	
v/c Ratio	0.34	0.08	0.49	0.06	0.28	0.68
Uniform Delay, d1	33.6	31.7	6.5	4.4	5.2	8.2
Progression Factor	0.94	0.89	1.00	1.00	0.82	0.76
Incremental Delay, d2	2.4	0.4	1.4	0.1	1.3	2.5
Delay (s)	34.1	28.6	7.8	4.5	5.6	8.8
Level of Service	C	C	A	A	A	A
Approach Delay (s)	31.3		7.4			8.4
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	447	376	351	323	376	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	486	409	382	351	409	527
RTOR Reduction (vph)	0	75	0	241	0	0
Lane Group Flow (vph)	486	334	382	110	409	527
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	32.6	52.6	29.4	29.4	20.0	55.4
Effective Green, g (s)	34.6	56.6	31.4	31.4	22.0	57.4
Actuated g/C Ratio	0.35	0.57	0.31	0.31	0.22	0.57
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)	601	1656	1090	858	741	1992
v/s Ratio Prot	c0.28	0.07	c0.11		c0.12	0.15
v/s Ratio Perm		0.05		0.04		
v/c Ratio	0.81	0.20	0.35	0.13	0.55	0.26
Uniform Delay, d1	29.7	10.6	26.4	24.5	34.6	10.7
Progression Factor	1.15	1.56	1.07	1.77	0.73	0.57
Incremental Delay, d2	7.1	0.1	0.8	0.3	2.8	0.3
Delay (s)	41.3	16.7	29.1	43.8	27.9	6.5
Level of Service	D	B	C	D	C	A
Approach Delay (s)	30.0		36.1			15.8
Approach LOS	C		D			B

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	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)	1736	3471	1553	1736	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.66	1.00	1.00	0.68	1.00	1.00	0.30	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	1198	3471	1553	1246	3471	1553	545	3471	1553	1069	3471	1553
Volume (vph)	134	102	259	160	140	293	259	249	116	293	345	185
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)	146	111	282	174	152	318	282	271	126	318	375	201
RTOR Reduction (vph)	0	0	184	0	0	207	0	0	95	0	0	163
Lane Group Flow (vph)	146	111	98	174	152	111	282	271	31	318	375	38
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	38.7	32.8	32.8	38.7	32.8	32.8	42.9	22.5	22.5	31.7	16.9	16.9
Effective Green, g (s)	42.7	34.8	34.8	42.7	34.8	34.8	45.3	24.5	24.5	35.7	18.9	18.9
Actuated g/C Ratio	0.43	0.35	0.35	0.43	0.35	0.35	0.45	0.24	0.24	0.36	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	554	1208	540	571	1208	540	514	850	380	494	656	294
v/s Ratio Prot	0.02	0.03		c0.02	0.04		c0.12	0.08		c0.11	0.11	
v/s Ratio Perm	0.09		0.06	c0.11		0.07	0.13		0.02	c0.12		0.02
v/c Ratio	0.26	0.09	0.18	0.30	0.13	0.20	0.55	0.32	0.08	0.64	0.57	0.13
Uniform Delay, d1	18.7	22.0	22.7	19.1	22.2	22.9	18.6	30.9	29.1	25.3	36.9	33.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.80	1.43	3.52	0.97	0.78	0.18
Incremental Delay, d2	0.3	0.2	0.7	0.3	0.2	0.9	1.2	0.2	0.1	2.5	1.1	0.2
Delay (s)	19.0	22.1	23.4	19.4	22.4	23.7	34.6	44.4	102.6	27.2	29.9	6.3
Level of Service	B	C	C	B	C	C	C	D	F	C	C	A
Approach Delay (s)		21.9			22.3			51.2			23.6	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.97	0.91	0.91	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)	3367	1553	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	1553	3367	4988	4988	1553
Volume (vph)	356	240	240	2097	2897	491
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	387	261	261	2279	3149	534
RTOR Reduction (vph)	0	83	0	0	0	3
Lane Group Flow (vph)	387	178	261	2279	3149	531
Turn Type		Perm	Prot			custom
Protected Phases	4		5	2	6	6
Permitted Phases		4				4
Actuated Green, G (s)	15.0	15.0	7.0	73.0	60.0	75.0
Effective Green, g (s)	17.0	17.0	9.0	75.0	62.0	79.0
Actuated g/C Ratio	0.17	0.17	0.09	0.75	0.62	0.79
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)	572	264	303	3741	3093	1289
v/s Ratio Prot	c0.11		c0.08	0.46	c0.63	0.26
v/s Ratio Perm		0.11				0.09
v/c Ratio	0.68	0.67	0.86	0.61	1.02	0.41
Uniform Delay, d1	38.9	38.9	44.9	5.8	19.0	3.3
Progression Factor	0.82	0.73	1.04	0.74	1.00	1.00
Incremental Delay, d2	3.0	6.3	18.7	0.6	20.9	0.2
Delay (s)	35.0	34.7	65.3	4.9	39.9	3.5
Level of Service	D	C	E	A	D	A
Approach Delay (s)	34.9			11.1	34.6	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: PM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032 Full Buildout
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					1284	115
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					1395	124
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						166
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						180
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								180
C(m) (vph)								746
v/c								0.24
95% queue length								0.94
Control Delay								11.4
LOS								B
Approach Delay							11.4	
Approach LOS							B	

Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.97	0.91	0.91	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)	3367	2733	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	2733	3367	4988	4988	1553
Volume (vph)	485	245	245	2603	1885	351
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	527	266	266	2829	2049	382
RTOR Reduction (vph)	0	209	0	0	0	18
Lane Group Flow (vph)	527	57	266	2829	2049	364
Turn Type		Perm	Prot			pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	19.4	19.4	10.9	68.6	51.7	71.1
Effective Green, g (s)	21.4	21.4	12.9	70.6	53.7	75.1
Actuated g/C Ratio	0.21	0.21	0.13	0.71	0.54	0.75
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)	721	585	434	3522	2679	1228
v/s Ratio Prot	c0.16		0.08	c0.57	0.41	0.06
v/s Ratio Perm		0.02				0.17
v/c Ratio	0.73	0.10	0.61	0.80	0.76	0.30
Uniform Delay, d1	36.6	31.5	41.2	10.0	18.2	4.0
Progression Factor	1.09	2.98	1.00	1.00	0.28	0.14
Incremental Delay, d2	3.6	0.1	2.6	2.0	1.3	0.1
Delay (s)	43.6	94.1	43.8	12.0	6.4	0.6
Level of Service	D	F	D	B	A	A
Approach Delay (s)	60.5			14.7	5.5	
Approach LOS	E			B	A	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	1553	1827	1553	1736	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.22	1.00
Satd. Flow (perm)	1736	1553	1827	1553	403	1827
Volume (vph)	83	115	817	115	115	591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	125	888	125	125	642
RTOR Reduction (vph)	0	99	0	36	0	0
Lane Group Flow (vph)	90	26	888	89	125	642
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	19.0	19.0	69.0	69.0	69.0	69.0
Effective Green, g (s)	21.0	21.0	71.0	71.0	71.0	71.0
Actuated g/C Ratio	0.21	0.21	0.71	0.71	0.71	0.71
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)	365	326	1297	1103	286	1297
v/s Ratio Prot	c0.05		c0.49			0.35
v/s Ratio Perm		0.02		0.06	0.31	
v/c Ratio	0.25	0.08	0.68	0.08	0.44	0.49
Uniform Delay, d1	32.9	31.7	8.2	4.5	6.1	6.5
Progression Factor	0.94	0.97	1.00	1.00	0.51	0.48
Incremental Delay, d2	1.5	0.4	3.0	0.1	4.4	1.2
Delay (s)	32.3	31.2	11.1	4.6	7.5	4.3
Level of Service	C	C	B	A	A	A
Approach Delay (s)	31.7		10.3			4.9
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.88	0.95	0.88	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)	1736	2733	3471	2733	3367	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	2733	3471	2733	3367	3471
Volume (vph)	323	376	485	447	376	351
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	351	409	527	486	409	382
RTOR Reduction (vph)	0	56	0	355	0	0
Lane Group Flow (vph)	351	353	527	131	409	382
Turn Type		custom		Perm	Prot	
Protected Phases	8	8	2		1	6
Permitted Phases		1		2		
Actuated Green, G (s)	24.6	57.0	25.0	25.0	32.4	63.4
Effective Green, g (s)	26.6	61.0	27.0	27.0	34.4	65.4
Actuated g/C Ratio	0.27	0.61	0.27	0.27	0.34	0.65
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)	462	1776	937	738	1158	2270
v/s Ratio Prot	c0.20	0.05	c0.15		c0.12	0.11
v/s Ratio Perm		0.08		0.05		
v/c Ratio	0.76	0.20	0.56	0.18	0.35	0.17
Uniform Delay, d1	33.8	8.7	31.4	28.0	24.5	6.7
Progression Factor	1.02	0.77	0.78	0.78	0.73	0.60
Incremental Delay, d2	6.7	0.1	1.9	0.4	0.8	0.2
Delay (s)	41.2	6.7	26.2	22.2	18.8	4.2
Level of Service	D	A	C	C	B	A
Approach Delay (s)	22.6		24.3			11.7
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	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)	1736	3471	1553	1736	3471	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.61	1.00	1.00	0.66	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Satd. Flow (perm)	1114	3471	1553	1198	3471	1553	0	3471	1553	0	3471	1553
Volume (vph)	185	140	259	116	102	293	259	345	160	293	249	134
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)	201	152	282	126	111	318	282	375	174	318	271	146
RTOR Reduction (vph)	0	0	197	0	0	232	0	0	141	0	0	111
Lane Group Flow (vph)	201	152	85	126	111	86	282	375	33	318	271	35
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	39.3	28.2	28.2	32.9	25.0	25.0	18.1	17.2	17.2	22.7	21.8	21.8
Effective Green, g (s)	43.3	30.2	30.2	36.9	27.0	27.0	20.1	19.2	19.2	24.7	23.8	23.8
Actuated g/C Ratio	0.43	0.30	0.30	0.37	0.27	0.27	0.20	0.19	0.19	0.25	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	564	1048	469	495	937	419	349	666	298	429	826	370
v/s Ratio Prot	c0.05	0.04		0.03	0.03		c0.16	0.11		c0.18	0.08	
v/s Ratio Perm	c0.11		0.05	0.07		0.06			0.02			0.02
v/c Ratio	0.36	0.15	0.18	0.25	0.12	0.20	0.81	0.56	0.11	0.74	0.33	0.09
Uniform Delay, d1	18.2	25.5	25.8	21.5	27.5	28.2	38.1	36.6	33.4	34.7	31.5	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.61	0.35	0.73	0.73	0.29
Incremental Delay, d2	0.4	0.3	0.8	0.3	0.3	1.1	12.0	1.0	0.2	6.3	0.2	0.1
Delay (s)	18.6	25.8	26.6	21.7	27.8	29.3	35.9	23.2	11.7	31.8	23.3	8.6
Level of Service	B	C	C	C	C	C	D	C	B	C	C	A
Approach Delay (s)		23.9			27.3			25.1			24.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.97	0.91	0.91	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)	3367	1553	3367	4988	4988	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3367	1553	3367	4988	4988	1553
Volume (vph)	491	240	240	2897	2097	356
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	534	261	261	3149	2279	387
RTOR Reduction (vph)	0	126	0	0	0	10
Lane Group Flow (vph)	534	135	261	3149	2279	377
Turn Type		Perm	Prot			custom
Protected Phases	4		5	2	6	6
Permitted Phases		4				4
Actuated Green, G (s)	19.0	19.0	9.0	69.0	54.0	73.0
Effective Green, g (s)	21.0	21.0	11.0	71.0	56.0	77.0
Actuated g/C Ratio	0.21	0.21	0.11	0.71	0.56	0.77
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)	707	326	370	3541	2793	1258
v/s Ratio Prot	c0.16		0.08	c0.63	0.46	0.17
v/s Ratio Perm		0.09				0.07
v/c Ratio	0.76	0.42	0.71	0.89	0.82	0.30
Uniform Delay, d1	37.1	34.2	42.9	11.4	17.8	3.4
Progression Factor	0.57	0.36	0.87	0.62	1.00	1.00
Incremental Delay, d2	4.1	0.8	3.7	2.3	2.8	0.1
Delay (s)	25.4	12.9	41.2	9.4	20.6	3.6
Level of Service	C	B	D	A	C	A
Approach Delay (s)	21.3			11.9	18.1	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/21/2007
Analysis Time Period: AM
Intersection: US 231 @ Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2022 Interim Failure Analysis
Project ID: GCP
East/West Street: US 231
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume					2361	150
Peak-Hour Factor, PHF					0.92	0.92
Hourly Flow Rate, HFR					2566	163
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes					2	1
Configuration					T	R
Upstream Signal?		No			Yes	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						211
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						229
Percent Heavy Vehicles						4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config								R
v (vph)								229
C(m) (vph)								433
v/c								0.53
95% queue length								3.01
Control Delay								22.3
LOS								C
Approach Delay							22.3	
Approach LOS							C	

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/22/2007
Analysis Time Period: AM
Intersection: New CR 390/Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2012
Project ID:
East/West Street: New CR 390
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		342	106	51	472	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		371	115	55	513	
Percent Heavy Vehicles		--	--	4	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?			No			
Lanes		1	1	1	1	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	147		51			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	159		55			
Percent Heavy Vehicles	4		4			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes		1	1			
Configuration		L	R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		55	159		55			
C(m) (vph)		1067	378		670			
v/c		0.05	0.42		0.08			
95% queue length		0.16	2.03		0.27			
Control Delay		8.6	21.3		10.9			
LOS		A	C		B			
Approach Delay				18.6				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/22/2007
Analysis Time Period: PM
Intersection: New CR 390/Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2012
Project ID:
East/West Street: New CR 390
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		472	147	51	342	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		513	159	55	371	
Percent Heavy Vehicles		--	--	4	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?			No			
Lanes		1	1	1	1	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	106		51			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	115		55			
Percent Heavy Vehicles	4		4			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes		1	1			
Configuration		L	R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		55	115		55			
C(m) (vph)		909	384		557			
v/c		0.06	0.30		0.10			
95% queue length		0.19	1.24		0.33			
Control Delay		9.2	18.3		12.2			
LOS		A	C		B			
Approach Delay				16.3				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/22/2007
Analysis Time Period: AM
Intersection: New CR 390/Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032
Project ID: GCP
East/West Street: New CR 390
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		504	166	121	695	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		547	180	131	755	
Percent Heavy Vehicles		--	--	4	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?			No			
Lanes		1	1	1	1	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	230		121			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	249		131			
Percent Heavy Vehicles	4		4			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes		1	1			
Configuration		L	R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		131	249		131			
C(m) (vph)		867	218		533			
v/c		0.15	1.14		0.25			
95% queue length		0.53	11.79		0.96			
Control Delay		9.9	151.0		13.9			
LOS		A	F		B			
Approach Delay				103.8				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: SDM
Agency/Co.: PBS&J
Date Performed: 3/22/2007
Analysis Time Period: PM
Intersection: New CR 390/Old CR 390
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2032
Project ID: GCP
East/West Street: New CR 390
North/South Street: Old CR 390
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		695	230	121	504	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		755	249	131	547	
Percent Heavy Vehicles		--	--	4	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?			No			
Lanes		1	1	1	1	
Configuration		T	R	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	166		121			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	180		131			
Percent Heavy Vehicles	4		4			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes		1	1			
Configuration		L	R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L	L		R			
v (vph)		131	180		131			
C(m) (vph)		682	226		405			
v/c		0.19	0.80		0.32			
95% queue length		0.71	5.83		1.38			
Control Delay		11.5	63.5		18.1			
LOS		B	F		C			
Approach Delay				44.4				
Approach LOS				E				

Appendix C – SimTraffic Queuing Reports

Intersection: 1: Old CR 390 & US 231

Movement	SE
Directions Served	R
Maximum Queue (ft)	142
Average Queue (ft)	60
95th Queue (ft)	123
Link Distance (ft)	1118
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: CR 2321 & US 231

Movement	SB	SB	SB	SB	NE	NE	NE	NE	NE	SW	SW	SW
Directions Served	L	L	R	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	380	345	79	44	291	269	180	210	253	590	573	491
Average Queue (ft)	174	163	16	11	190	173	93	95	76	447	410	342
95th Queue (ft)	313	301	53	31	267	246	155	163	159	590	559	497
Link Distance (ft)	1050	1050					476	476	476	4186	4186	4186
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			500	500	500	500						
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: CR 2321 & US 231

Movement	SW
Directions Served	R
Maximum Queue (ft)	288
Average Queue (ft)	154
95th Queue (ft)	263
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	1000
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Old CR 390 & CR 390 Realigned

Movement	NW	NW	NE	NE	SW	SW
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	167	64	270	56	156	247
Average Queue (ft)	77	25	146	34	64	100
95th Queue (ft)	147	47	249	56	119	188
Link Distance (ft)	1118		2106		1509	1509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300		300		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: CR 2321 & CR 390 Realigned

Movement	NW	NW	NW	NE	NE	NE	NE	SW	SW	SW	SW
Directions Served	L	R	R	T	T	R	R	L	L	T	T
Maximum Queue (ft)	464	85	55	115	80	94	95	331	335	96	84
Average Queue (ft)	269	37	20	52	37	53	50	158	205	41	34
95th Queue (ft)	411	70	42	97	71	79	79	256	301	85	75
Link Distance (ft)	1050	1050		1509	1509					784	784
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			500			500	500	500	500		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 5: GCP & CR 390 Realigned

Movement	SE	SE	NW	NW	NE	NE
Directions Served	T	R	L	T	L	R
Maximum Queue (ft)	116	205	266	161	327	130
Average Queue (ft)	56	87	185	36	176	42
95th Queue (ft)	98	145	263	97	282	76
Link Distance (ft)	1850			3082	784	784
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300	300			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Nework Summary

Network wide Queuing Penalty: 0

Intersection: 1: Old CR 390 & US 231

Movement	SE	NE
Directions Served	R	T
Maximum Queue (ft)	119	33
Average Queue (ft)	24	1
95th Queue (ft)	77	11
Link Distance (ft)	1118	4232
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: CR 2321 & US 231

Movement	SB	SB	SB	SB	NE	NE	NE	NE	NE	SW	SW	SW
Directions Served	L	L	R	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	398	367	127	130	281	467	503	476	505	674	656	620
Average Queue (ft)	274	257	47	38	185	174	300	310	289	402	383	352
95th Queue (ft)	361	347	107	94	259	295	432	452	459	566	529	468
Link Distance (ft)	1050	1050					476	476	476	4186	4186	4186
Upstream Blk Time (%)						0	0	0	0			
Queuing Penalty (veh)						0	2	1	3			
Storage Bay Dist (ft)			500	500	500	500						
Storage Blk Time (%)						0	0					
Queuing Penalty (veh)						0	1					

Intersection: 2: CR 2321 & US 231

Movement	SW
Directions Served	R
Maximum Queue (ft)	285
Average Queue (ft)	97
95th Queue (ft)	210
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	1000
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Old CR 390 & CR 390 Realigned

Movement	NW	NW	NE	NE	SW	SW
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	147	62	446	78	198	205
Average Queue (ft)	56	29	160	39	78	57
95th Queue (ft)	124	53	302	69	151	133
Link Distance (ft)	1118		2106		1509	1509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300		300		
Storage Blk Time (%)			0			
Queuing Penalty (veh)			1			

Intersection: 4: CR 2321 & CR 390 Realigned

Movement	NW	NW	NW	NE	NE	NE	NE	SW	SW	SW	SW
Directions Served	L	R	R	T	T	R	R	L	L	T	T
Maximum Queue (ft)	428	147	105	159	94	113	98	227	264	53	73
Average Queue (ft)	244	77	41	73	48	58	59	146	189	21	28
95th Queue (ft)	401	130	82	118	85	90	96	216	249	50	63
Link Distance (ft)	1050	1050		1509	1509					784	784
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			500			500	500	500	500		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 5: GCP & CR 390 Realigned

Movement	SE	SE	NW	NW	NE	NE
Directions Served	T	R	L	T	L	R
Maximum Queue (ft)	115	179	397	115	435	171
Average Queue (ft)	53	80	187	24	152	53
95th Queue (ft)	97	140	330	68	315	103
Link Distance (ft)	1850			3082	784	784
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300	600			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Nework Summary

Network wide Queuing Penalty: 8

Intersection: 1: Old CR 390 & US 231

Movement	SE
Directions Served	R
Maximum Queue (ft)	162
Average Queue (ft)	35
95th Queue (ft)	96
Link Distance (ft)	1117
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: CR 2321 & US 231

Movement	SB	SB	SB	SB	NE	NE	NE	NE	NE	SW	SW	SW
Directions Served	L	L	R	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	208	208	34	20	180	159	219	202	135	420	382	345
Average Queue (ft)	87	75	3	1	107	88	106	90	51	190	183	191
95th Queue (ft)	168	161	17	8	163	140	176	162	114	298	281	280
Link Distance (ft)	1043	1043					476	476	476	1634	1634	1634
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			500	500	500	500						
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: CR 2321 & US 231

Movement	SW
Directions Served	R
Maximum Queue (ft)	134
Average Queue (ft)	60
95th Queue (ft)	111
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	1000
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Old CR 390 & CR 390 Realigned

Movement	NW	NW	NE	NE	SW	SW
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	125	79	372	54	119	495
Average Queue (ft)	43	28	152	16	52	191
95th Queue (ft)	97	59	298	43	98	362
Link Distance (ft)	1117		2106		1509	1509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300		300		
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 4: CR 2321 & CR 390 Realigned

Movement	NW	NW	NW	NE	NE	NE	NE	SW	SW	SW	SW
Directions Served	L	R	R	T	T	R	R	L	L	T	T
Maximum Queue (ft)	403	80	36	205	205	135	97	164	202	140	165
Average Queue (ft)	232	31	14	121	88	61	54	97	126	85	88
95th Queue (ft)	358	65	33	198	162	111	88	148	183	152	160
Link Distance (ft)	1043	1043		1509	1509					784	784
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			500			500	500	500	500		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 5: GCP & CR 390 Realigned

Movement	SE	SE	SE	NW	NW	NW	NE	NE	NE	NE	SW	SW
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	198	154	129	215	169	76	367	152	88	48	286	330
Average Queue (ft)	92	53	61	94	71	34	153	83	45	26	143	185
95th Queue (ft)	171	112	108	181	135	58	295	127	83	51	237	274
Link Distance (ft)		1841			3057			784	784			1266
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000		1000	1000		1000	500			500	500	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 5: GCP & CR 390 Realigned

Movement	SW
Directions Served	R
Maximum Queue (ft)	74
Average Queue (ft)	44
95th Queue (ft)	71
Link Distance (ft)	1266
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: CR 390 Realigned &

Movement	SE	SE	SE	NE	NE	NE	NE	NE	SW	SW	SW	SW
Directions Served	L	L	R	L	L	T	T	T	T	T	T	R
Maximum Queue (ft)	176	170	174	542	439	244	244	180	1302	1305	1321	1019
Average Queue (ft)	87	106	92	341	284	116	127	90	705	695	697	440
95th Queue (ft)	134	154	164	598	512	202	209	167	1101	1073	1059	1024
Link Distance (ft)		1266	1266			1634	1634	1634	3507	3507	3507	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			1000	1000							1000
Storage Blk Time (%)											1	1
Queuing Penalty (veh)											5	8

Nework Summary

Network wide Queuing Penalty: 13

Intersection: 1: Old CR 390 & US 231

Movement	SE	NE	NE	NE
Directions Served	R	T	T	T
Maximum Queue (ft)	38	353	236	198
Average Queue (ft)	6	16	9	7
95th Queue (ft)	28	127	81	68
Link Distance (ft)	1117	4232	4232	4232
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: CR 2321 & US 231

Movement	SB	SB	SB	SB	NE	NE	NE	NE	NE	SW	SW	SW
Directions Served	L	L	R	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	311	1185	103	94	214	180	537	535	537	703	646	756
Average Queue (ft)	155	175	16	13	114	97	232	224	183	183	167	170
95th Queue (ft)	269	518	57	49	181	156	414	416	376	433	403	417
Link Distance (ft)	1043	1043					476	476	476	1634	1634	1634
Upstream Blk Time (%)		0					1	1	1			
Queuing Penalty (veh)		0					11	9	6			
Storage Bay Dist (ft)			500	500	500	500						
Storage Blk Time (%)							1					
Queuing Penalty (veh)							3					

Intersection: 2: CR 2321 & US 231

Movement	SW
Directions Served	R
Maximum Queue (ft)	604
Average Queue (ft)	46
95th Queue (ft)	228
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	1000
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Old CR 390 & CR 390 Realigned

Movement	NW	NW	NE	NE	SW	SW
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	103	80	441	75	267	205
Average Queue (ft)	30	29	219	25	83	114
95th Queue (ft)	74	58	377	58	177	190
Link Distance (ft)	1117		2106		1509	1509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300		300		
Storage Blk Time (%)			1			
Queuing Penalty (veh)			2			

Intersection: 4: CR 2321 & CR 390 Realigned

Movement	NW	NW	NW	NE	NE	NE	NE	SW	SW	SW	SW
Directions Served	L	R	R	T	T	R	R	L	L	T	T
Maximum Queue (ft)	362	121	102	300	222	74	73	191	202	137	114
Average Queue (ft)	183	56	27	145	104	45	39	85	100	51	37
95th Queue (ft)	324	113	70	242	174	66	64	144	153	96	83
Link Distance (ft)	1043	1043		1509	1509					784	784
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			500			500	500	500	500		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 5: GCP & CR 390 Realigned

Movement	SE	SE	SE	NW	NW	NW	NE	NE	NE	NE	SW	SW
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	221	180	137	130	169	81	526	710	128	133	340	192
Average Queue (ft)	117	83	51	68	46	41	219	126	55	46	173	105
95th Queue (ft)	193	145	93	106	110	69	430	378	114	102	294	182
Link Distance (ft)		1848			3057			784	784			1232
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000		1000	1000		1000	500			500	500	
Storage Blk Time (%)							2	0				
Queuing Penalty (veh)							3	0				

Intersection: 5: GCP & CR 390 Realigned

Movement	SW
Directions Served	R
Maximum Queue (ft)	63
Average Queue (ft)	24
95th Queue (ft)	49
Link Distance (ft)	1232
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: CR 390 Realigned &

Movement	SE	SE	SE	NE	NE	NE	NE	NE	SW	SW	SW	SW
Directions Served	L	L	R	L	L	T	T	T	T	T	T	R
Maximum Queue (ft)	243	282	170	336	275	537	439	483	423	417	415	113
Average Queue (ft)	145	155	90	225	91	235	224	209	275	266	255	39
95th Queue (ft)	236	248	168	329	201	412	385	364	392	380	379	90
Link Distance (ft)		1232	1232			1634	1634	1634	3507	3507	3507	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			1000	1000							1000
Storage Blk Time (%)												
Queuing Penalty (veh)												

Nework Summary

Network wide Queuing Penalty: 38

APPENDIX E
GULF COAST PARKWAY @ US 98 / TRAM ROAD (TRAM ROAD TERMINI) ALTERNATIVE TRAFFIC ANALYSIS TECHNICAL MEMORANDUM

Memorandum

Date: August 7, 2007

To: Greg Garrett, PBS&J

From: Steve Mikesell, PBS&J

Re: Gulf Coast Parkway @ US 98 / Tram Road Alternative
Traffic Analysis Technical Memorandum

CC: Cesar Segovia, PBS&J
Rosemary Woods, PBS&J

The purpose of this memorandum is to summarize the analysis of the conceptual roadway plans developed by Joel Leisch for the intersections of US 98 and Tram Road if the proposed Gulf Coast Parkway (GCP) alignment terminated at US 98. The "Initial" scenario, as shown in Figure 1, involves the following roadway modifications:

- Realign Tram Road where is curves approximately 500' from the intersection at US 98 so that the curve is removed and it creates a T-intersection with US 98 that is at a 90 degree angle.

A "Final" alternative scenario was also developed for this intersection to accommodate future traffic volumes. It would consist of the Initial scenario plus new ramps to connect US 98 to the new GCP lanes and a realignment of Tram Road to a new signalized intersection to the south of the current signal (as shown in Figure 2). GCP would also be made a four-lane roadway and US 98 is assumed to be a six-lane roadway. Currently, US 98 is a four-lane facility, however there is a potential for widening to six lanes in the future as part of a separate roadway project. The "Initial" scenario was analyzed with 2012 and 2022 projected traffic conditions. The "Final" scenario was analyzed with projected 2022 and 2032 traffic conditions. The projected traffic volumes for 2012, 2022 and 2032 are included in Appendix A of this memorandum.

The traffic analysis was conducted using Synchro traffic software which uses the Highway Capacity Manual (HCM) methodology to determine signalized intersection level of service (LOS). Signal

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timings for all signalized intersections were optimized using Synchro's optimization tool to achieve optimal intersection operating conditions and traffic progression. SimTraffic simulation was also used to evaluate conditions for the ramps and merge areas for the "Final" scenario.

For the Initial Scenario, the existing signalized intersection of US 98 and Tram Road/GCP was analyzed having only an additional northbound right turn lane on US 98. In addition, the stop controlled approach of 14th Street and US 98 was analyzed as a full movement median opening to determine if the intersection could operate as such. The results of the traffic operational analyses are summarized in Tables 1, 2, and 3. The results of the 2012 Initial scenario traffic conditions analysis indicate that US 98 and Tram Road/GCP would operate with unacceptable LOS conditions during the AM peak hour with the existing intersection arrangement and number of lanes. The stopped approach of 14th Street and US 98 would have failing conditions during the PM peak hour. By 2022, both of the intersections would have failing conditions during both the AM and PM peak hours.

In order to determine if the intersections could operate acceptably with only some turn lane improvements, a failure analysis was performed. Turn lane improvements were added to movements that were over capacity with existing geometric conditions until acceptable conditions resulted. For US 98 and Tram Road/GCP, the Tram Road/GCP approach would need to have dual left turn lanes and a single right turn lane to have acceptable LOS conditions. However, the 14th Street intersection would have failing conditions regardless of what improvements are considered to this unsignalized intersection. Therefore, it is recommended that 14th Street be made a right-in/right-out only approach to minimize impacts to US 98 and allow for a longer southbound left turn lane on US 98.

The Final Scenario was then analyzed with 2022 and 2032 traffic conditions. The Final Scenario assumes that US 98 has 6 lanes. The results of the analysis indicate that all signalized intersections would operate at LOS B or better. However, the unsignalized intersection of 14th Street and US 98 fails in both 2022 and 2032 with a full median opening. Therefore, it is recommended that this intersection approach be changed to a right-in/right-out only approach. Also, after running the SimTraffic simulation, it was discovered that there were some other potential issues with the merge

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junctions for the ramps connecting US 98 and the proposed GCP. The simulation showed severe congestion at both of the merge points since there was no acceleration lane, there is no opportunity for traffic to merge into the traffic flow. Therefore, acceleration lanes should be added at each of these locations to allow traffic to merge properly.

Copies of the Synchro CM Signalized and Unsignalized intersection capacity analysis reports can be found in Appendix B.

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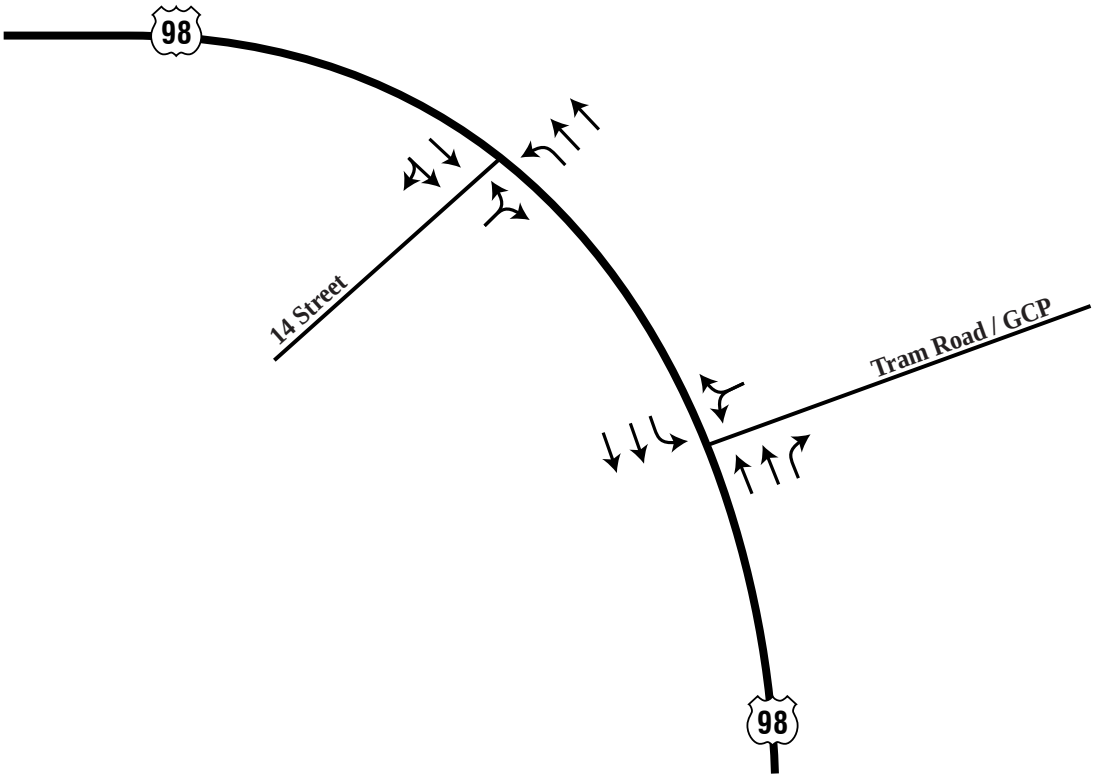
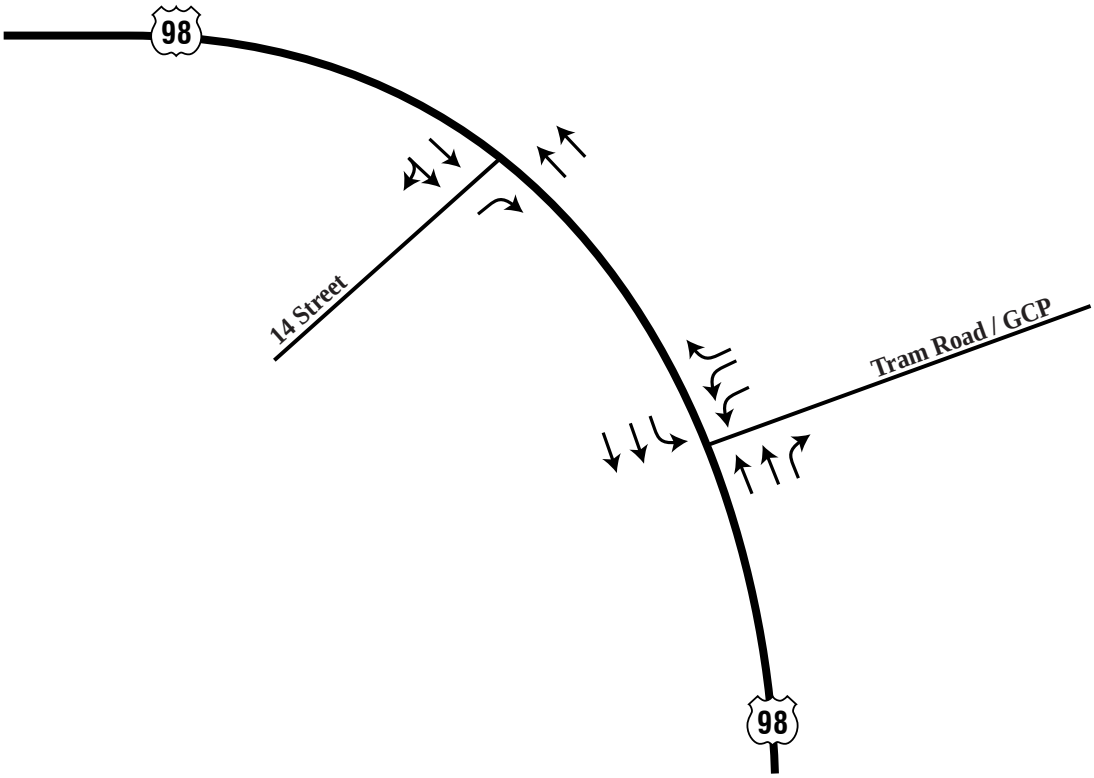
"Inital" Scenario Arrangement and Number of Lanes



"Inital" Scenario with Suggested Improvements



PBSJ

Arrangement and Number of Lanes
Tram Road and US 98 Intersection

FIGURE
1

T-Plang-GulfCoastPkwy-graphics-gcpLanes-7/30/07-cp

Table 1. Intersection Capacity Analysis Results – Initial Scenario

Intersection Delay and Levels of Service (LOS) in Seconds/Vehicle

Intersection	2012				2022			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
14th Street/ US 98	34.0	D	**79.5**	**F**	**59.1**	**F**	**233.1**	**F**
Tram Rd / US 98	**61.7**	**E**	43.4	D	**142.7**	**F**	**100.6**	**F**

Table 2. Intersection Capacity Analysis Results - Initial Scenario (with Suggested Improvements)

Intersection Delay and Levels of Service (LOS) in Seconds/Vehicle

Intersection	2012				2022			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
14th Street/ US 98 (Full Access)	33.2	C	**79.6**	**F**	**56.3**	**F**	**232.4**	**F**
14th Street/ US 98 (*RIRO Access)	18.4	C	30.2	D	23.8	C	**40.7**	**E**
Tram Rd / US 98	18.8	B	13.8	B	52.2	D	22.2	C

* RIRO (Right-in/Right-out)

Note: Bold values indicate unacceptable conditions.

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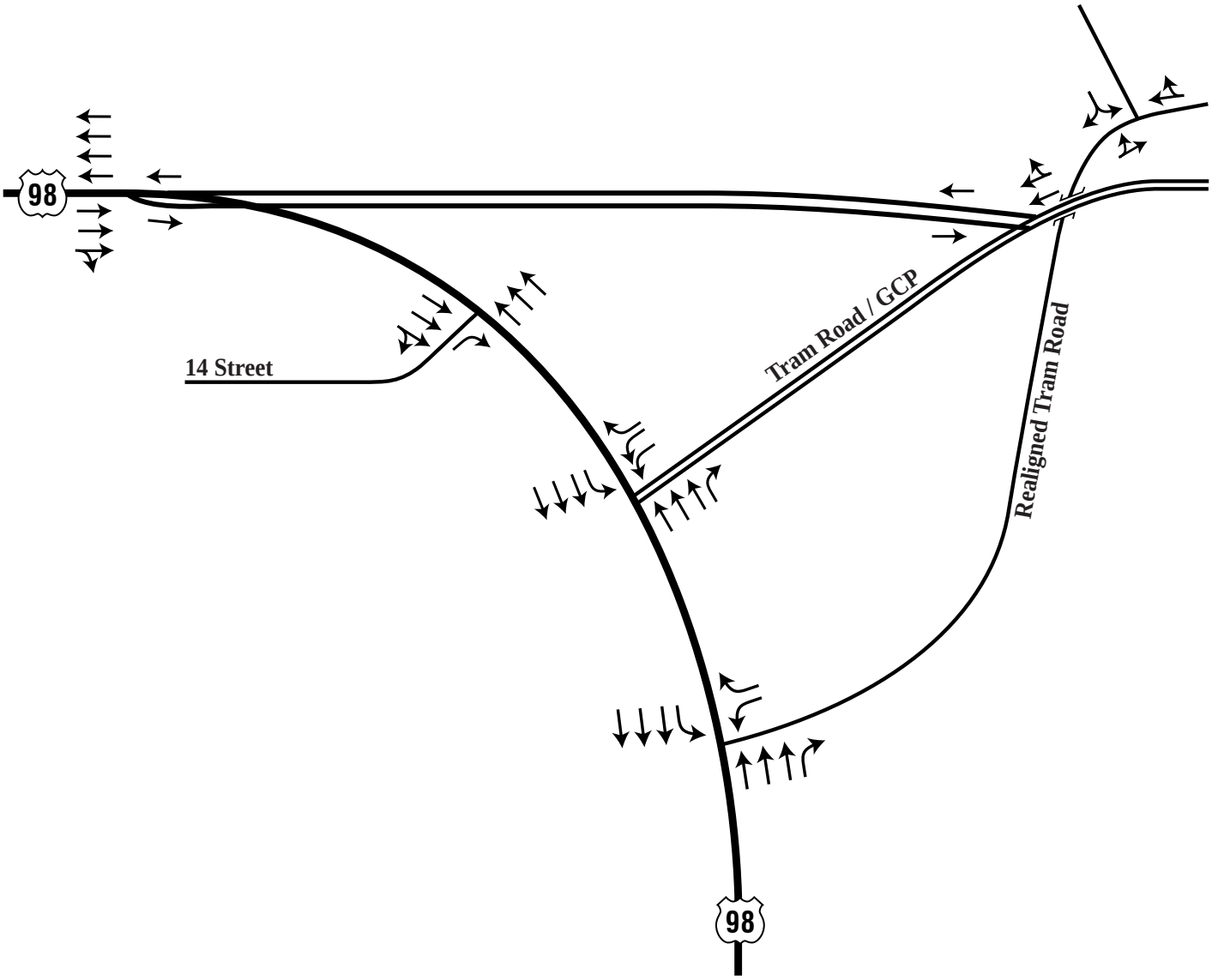
N.T.S.

"Final" Scenario Arrangement and Number of Lanes



PBSJ

Arrangement and Number of Lanes
Tram Road and US 98 Intersection

FIGURE
2

T-Plang-GulfCoastPkwy-graphics-gcpLanes-7/30/07-cp

Table 3. Intersection Capacity Analysis Results – Final Scenario (4 and 6 Lane US 98)

Intersection Delay and Levels of Service (LOS) in Seconds/Vehicle

Intersection	2022				2032			
	AM		PM		AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
14th Street / US 98	32.0	D	**83.0**	**F**	**50.2**	**F**	**237.4**	**F**
GCP / US 98	7.9	A	8.8	A	4.5	A	10.5	B
Realigned Tram Rd / US 98	5.3	A	4.4	A	6.6	A	9.1	A

Note: Bold values indicate unacceptable conditions.

QUEUING ANALYSIS

A SimTraffic queuing analysis was performed to determine the necessary turn lane storage needs for the Initial and Final scenarios. The 2032 AM and PM peak hour traffic conditions were used for the queuing analysis and an hour of simulation was run to determine the 95th percentile queue lengths for all left and right turn lanes. The resulting 95th percentile queue lengths were rounded to the nearest 25 feet and are illustrated in Figures 3 and 4. The queue lengths for through movements are provided so that the turn lane lengths can be checked to ensure that queues in the through lanes would not block turning vehicles from entering the turn lanes. Copies of the SimTraffic queuing and blocking reports can be found in Appendix C. *Note: These values are queue lengths only and do not include deceleration and taper lengths as described in the FDOT Standard Index 301. Queue length is 0' if not provided.*

The suggested improvements and modifications to the concepts drawings discussed in this memorandum are shown in the exhibits in Appendix D.

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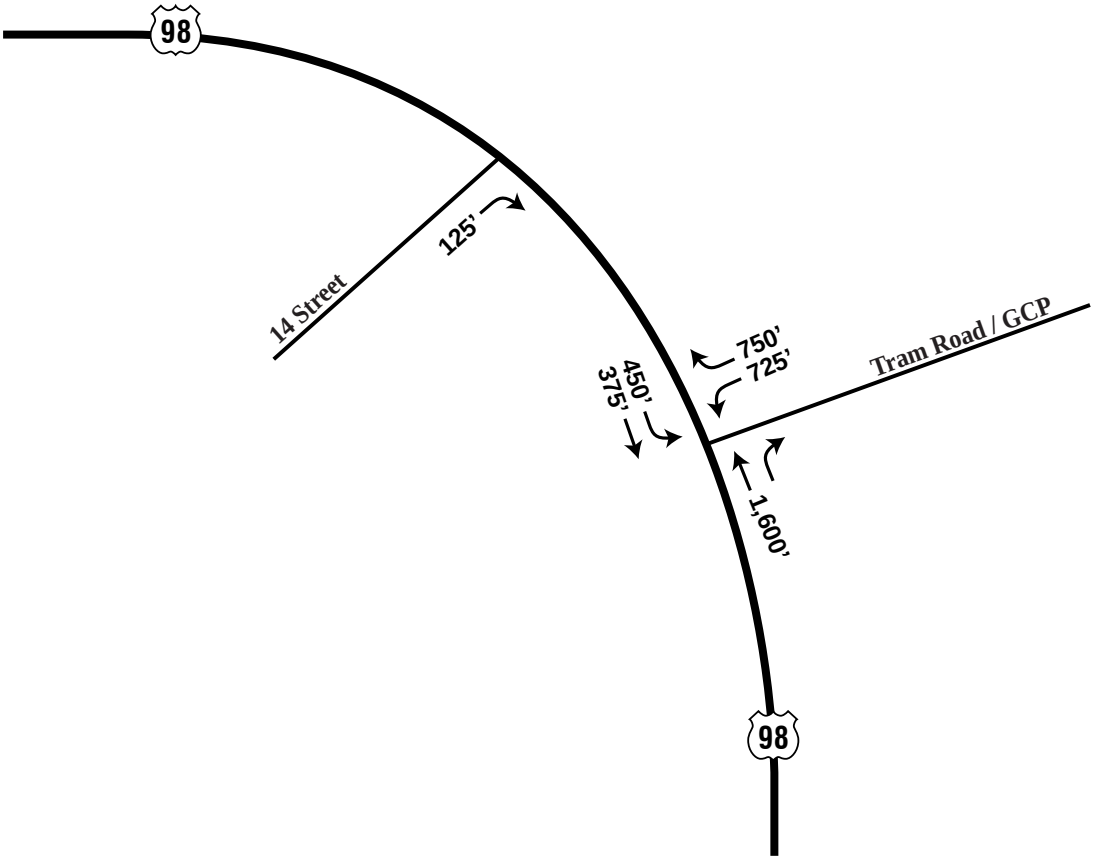
N.T.S.

"Inital" Scenario 2022 Queue Lengths



PBSJ

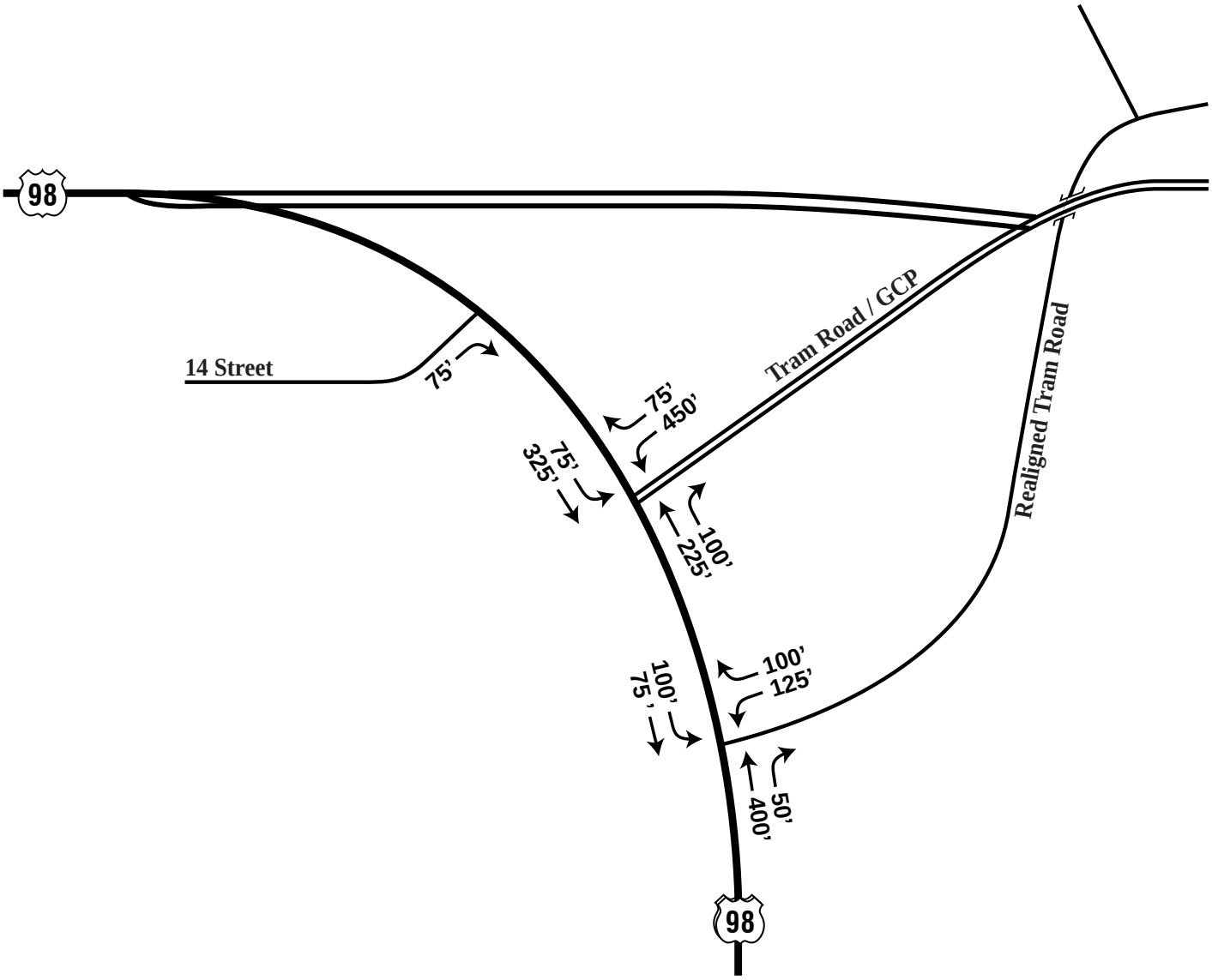
2022 Queue Lengths
Tram Road and US 98 Intersection

FIGURE
3

T-Plang-GulfCoastPkwy-graphics-gcpLanes-7/30/07-cp

N.T.S.

"Final" Scenario 2032 Queue Lengths



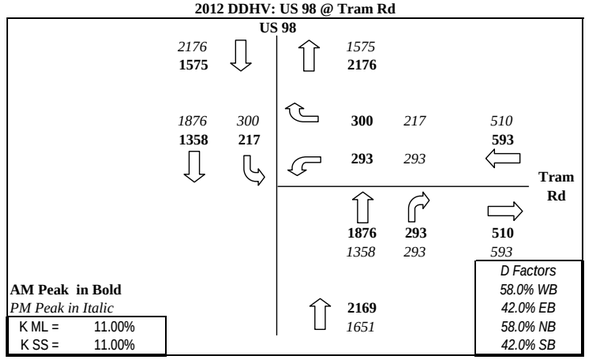
PBSJ	2032 Queuing Tram Road and US 98 Intersection	FIGURE 4

T-Plang-GulfCoastPkwy-graphics-gcpLanes-7/30/07-cp

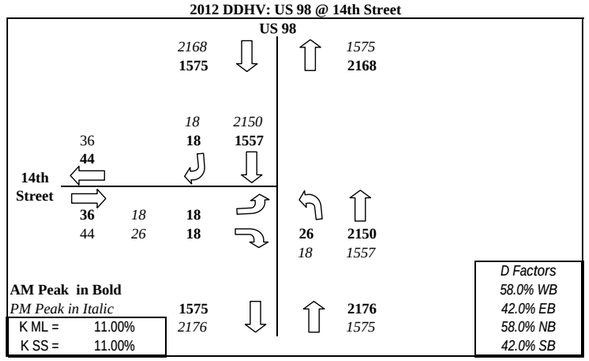
Appendix A
2012, 2022 and 2032 DDHV

Year 2012 DDHV Gulf Coast Parkway Tram Road@US 98 Initial Layout

2012 DDHV: US 98 @ Tram Rd

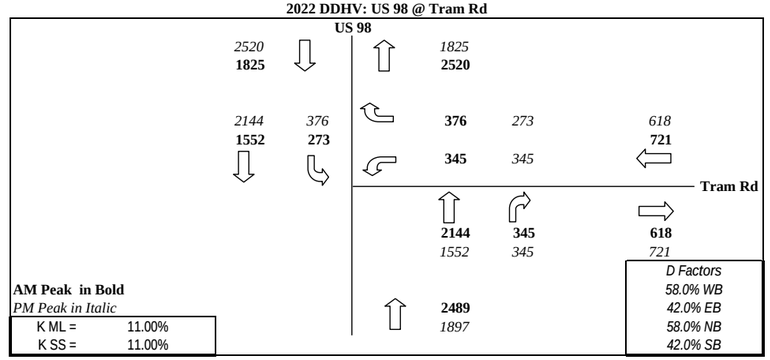


2012 DDHV: US 98 @ 14th Street

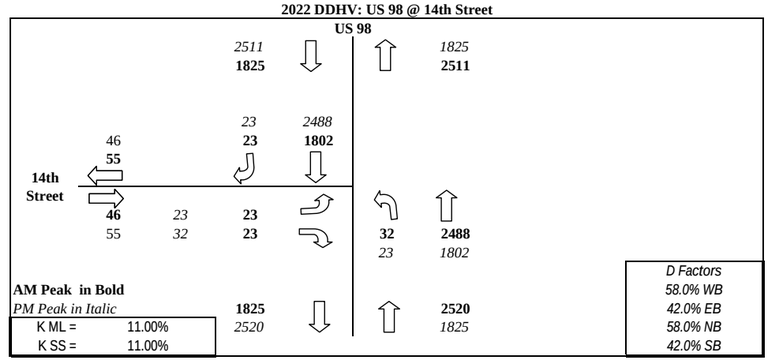


Year 2022 DDHV Gulf Coast Parkway Tram Road@US 98 Initial Layout

2022 DDHV: US 98 @ Tram Rd

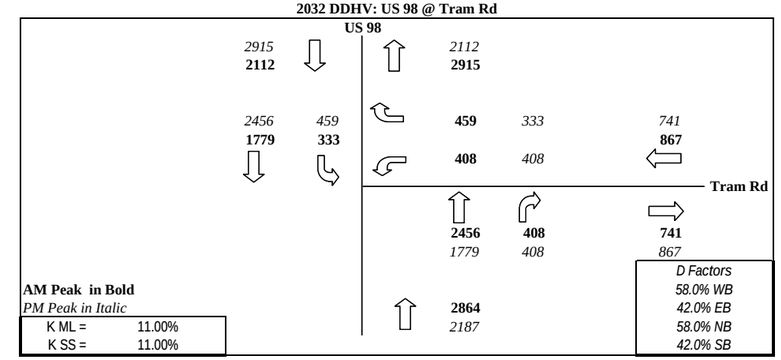


2022 DDHV: US 98 @ 14th Street

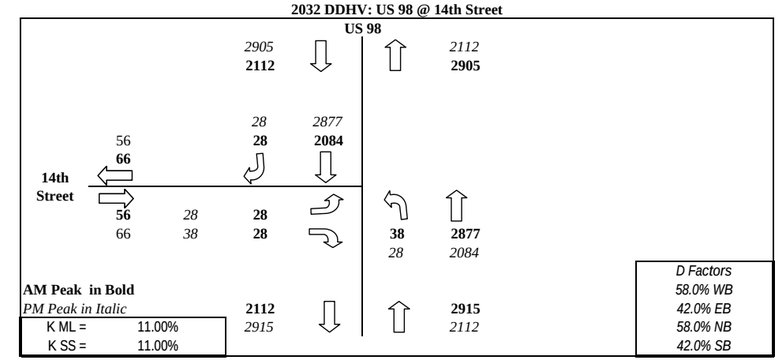


Year 2032 DDHV Gulf Coast Parkway Tram Road@US 98 Initial Layout

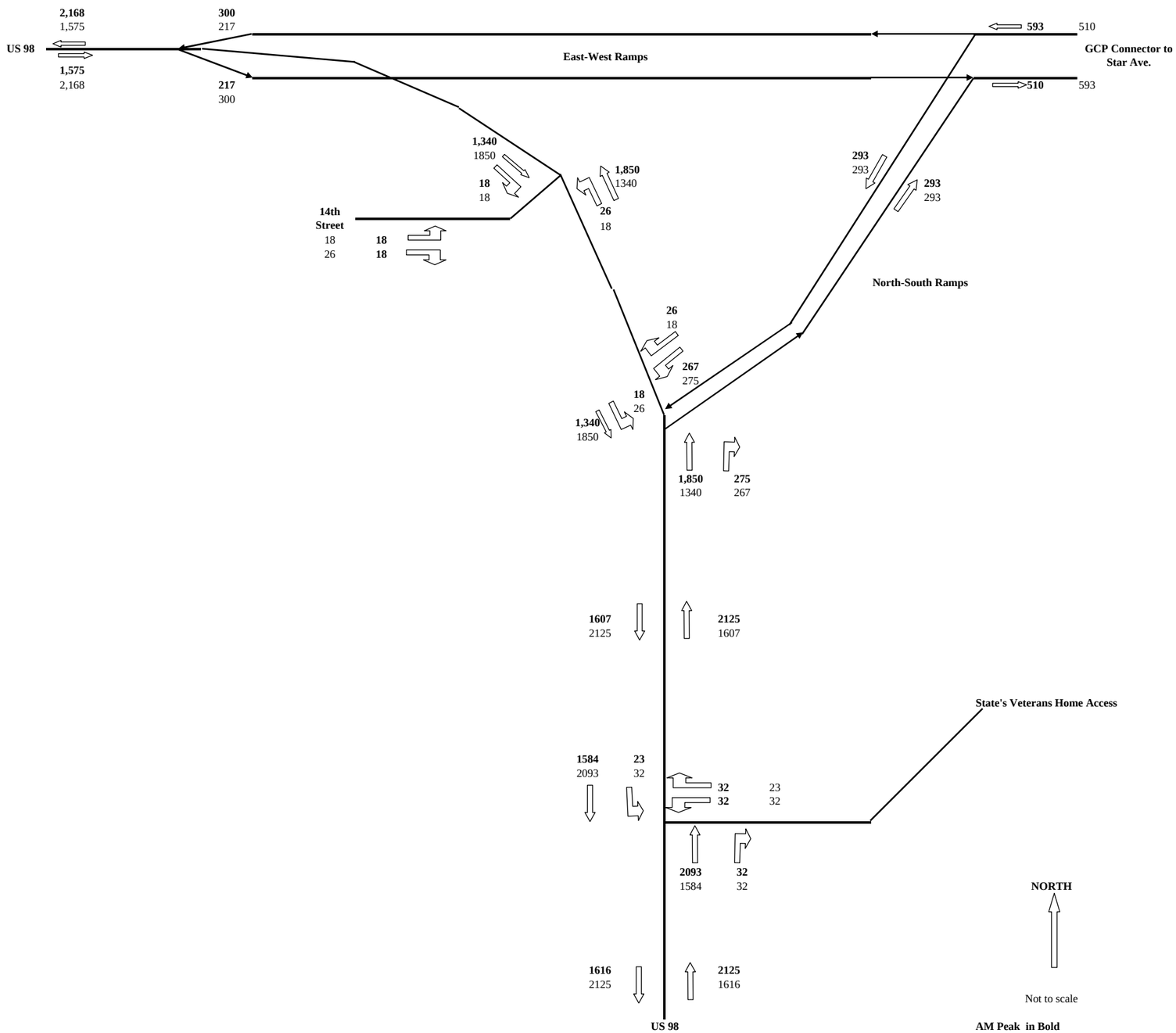
2032 DDHV: US 98 @ Tram Rd



2032 DDHV: US 98 @ 14th Street

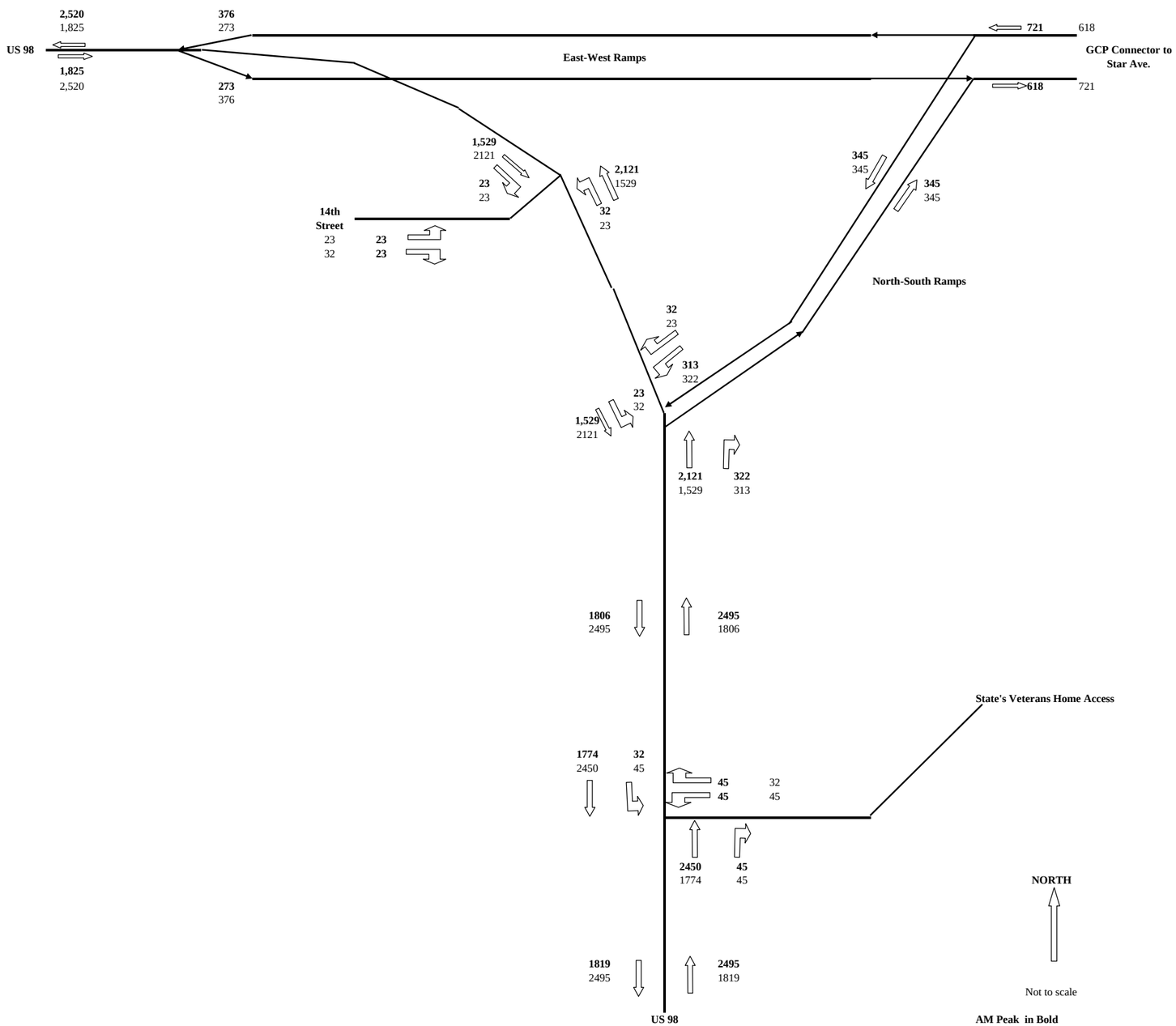


Year 2012 US 98 @ Tram Road Ultimate Layout DDHVs

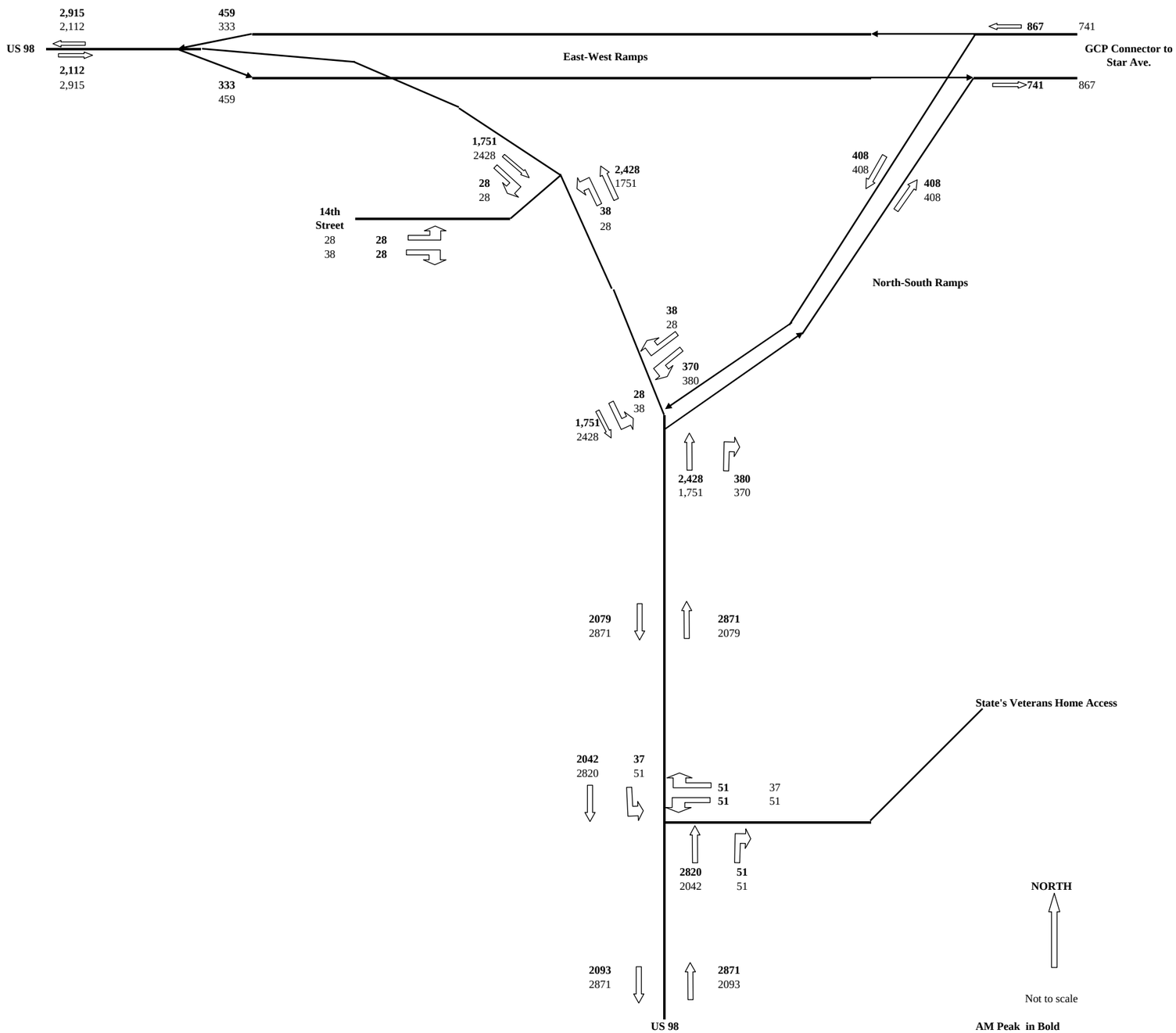


AM Peak in Bold

Year 2022 US 98 @ Tram Road Ultimate Layout DDHVs



Year 2032 US 98 @ Tram Road Ultimate Layout DDHVs



Appendix B
Synchro HCM Signalized &Unsignalized Worksheets

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Frt	0.94		1.00	0.85	1.00	1.00
Flt Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1676		3471	1553	1736	3471
Flt Permitted	0.97		1.00	1.00	0.06	1.00
Satd. Flow (perm)	1676		3471	1553	106	3471
Volume (vph)	293	204	1876	293	217	1344
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	222	2039	318	236	1461
RTOR Reduction (vph)	21	0	0	80	0	0
Lane Group Flow (vph)	519	0	2039	238	236	1461
Turn Type				Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	31.0		63.0	63.0	77.0	77.0
Effective Green, g (s)	33.0		65.0	65.0	79.0	79.0
Actuated g/C Ratio	0.28		0.54	0.54	0.66	0.66
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)	461		1880	841	206	2285
v/s Ratio Prot	c0.31		0.59		c0.10	0.42
v/s Ratio Perm				0.15	c0.66	
v/c Ratio	1.13		1.08	0.28	1.15	0.64
Uniform Delay, d1	43.5		27.5	14.9	57.2	12.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	81.0		47.8	0.8	107.5	0.6
Delay (s)	124.5		75.3	15.7	164.7	12.7
Level of Service	F		E	B	F	B
Approach Delay (s)	124.5		67.3			33.8
Approach LOS	F		E			C

Intersection Summary			
HCM Average Control Delay	61.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Frt	0.94		1.00	0.85	1.00	1.00
Flt Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1674		3471	1553	1736	3471
Flt Permitted	0.97		1.00	1.00	0.09	1.00
Satd. Flow (perm)	1674		3471	1553	170	3471
Volume (vph)	293	217	1358	293	300	1876
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	236	1476	318	326	2039
RTOR Reduction (vph)	29	0	0	147	0	0
Lane Group Flow (vph)	525	0	1476	171	326	2039
Turn Type				Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	25.0		37.0	37.0	53.0	53.0
Effective Green, g (s)	27.0		39.0	39.0	55.0	55.0
Actuated g/C Ratio	0.30		0.43	0.43	0.61	0.61
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)	502		1504	673	313	2121
v/s Ratio Prot	c0.31		0.43		0.14	c0.59
v/s Ratio Perm				0.11	c0.50	
v/c Ratio	1.05		0.98	0.25	1.04	0.96
Uniform Delay, d1	31.5		25.1	16.2	27.8	16.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	52.4		19.2	0.9	62.1	11.8
Delay (s)	83.9		44.3	17.1	89.9	28.3
Level of Service	F		D	B	F	C
Approach Delay (s)	83.9		39.5			36.8
Approach LOS	F		D			D

Intersection Summary			
HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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)	3367	1553	3471	1553	1736	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.08	1.00
Satd. Flow (perm)	3367	1553	3471	1553	141	3471
Volume (vph)	293	204	1876	293	217	1344
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	222	2039	318	236	1461
RTOR Reduction (vph)	0	107	0	114	0	0
Lane Group Flow (vph)	318	115	2039	204	236	1461
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	6.0	6.0	46.0	46.0	57.0	57.0
Effective Green, g (s)	8.0	8.0	48.0	48.0	59.0	59.0
Actuated g/C Ratio	0.11	0.11	0.64	0.64	0.79	0.79
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)	359	166	2221	994	260	2731
v/s Ratio Prot	c0.09		0.59		c0.08	0.42
v/s Ratio Perm		0.07		0.13	c0.63	
v/c Ratio	0.89	0.69	0.92	0.20	0.91	0.53
Uniform Delay, d1	33.0	32.3	11.8	5.6	23.2	2.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.0	11.7	7.5	0.5	32.2	0.2
Delay (s)	55.1	44.1	19.3	6.1	55.4	3.1
Level of Service	E	D	B	A	E	A
Approach Delay (s)	50.5		17.5			10.4
Approach LOS	D		B			B

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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)	3367	1553	3471	1553	1736	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.12	1.00
Satd. Flow (perm)	3367	1553	3471	1553	228	3471
Volume (vph)	293	217	1358	293	300	1876
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	236	1476	318	326	2039
RTOR Reduction (vph)	0	210	0	156	0	0
Lane Group Flow (vph)	318	26	1476	162	326	2039
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	4.0	4.0	26.0	26.0	39.0	39.0
Effective Green, g (s)	6.0	6.0	28.0	28.0	41.0	41.0
Actuated g/C Ratio	0.11	0.11	0.51	0.51	0.75	0.75
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)	367	169	1767	791	417	2587
v/s Ratio Prot	c0.09		0.43		0.13	c0.59
v/s Ratio Perm		0.02		0.10	0.45	
v/c Ratio	0.87	0.15	0.84	0.20	0.78	0.79
Uniform Delay, d1	24.1	22.2	11.5	7.4	12.4	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.8	0.4	4.8	0.6	9.2	1.7
Delay (s)	42.9	22.6	16.4	8.0	21.6	6.0
Level of Service	D	C	B	A	C	A
Approach Delay (s)	34.3		14.9			8.1
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Frt	0.93		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1659		3471	1553	1736	3471
Flt Permitted	0.98		1.00	1.00	0.05	1.00
Satd. Flow (perm)	1659		3471	1553	100	3471
Volume (vph)	345	376	2144	345	276	1552
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	409	2330	375	300	1687
RTOR Reduction (vph)	28	0	0	71	0	0
Lane Group Flow (vph)	756	0	2330	304	300	1687
Turn Type				Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	43.0		67.0	67.0	85.0	85.0
Effective Green, g (s)	45.0		69.0	69.0	87.0	87.0
Actuated g/C Ratio	0.32		0.49	0.49	0.62	0.62
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)	533		1711	765	226	2157
v/s Ratio Prot	c0.46		0.67		c0.13	0.49
v/s Ratio Perm				0.20	c0.69	
v/c Ratio	1.42		1.36	0.40	1.33	0.78
Uniform Delay, d1	47.5		35.5	22.4	65.2	19.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	199.2		166.7	1.5	174.6	1.9
Delay (s)	246.7		202.2	23.9	239.8	21.4
Level of Service	F		F	C	F	C
Approach Delay (s)	246.7		177.5			54.4
Approach LOS	F		F			D

Intersection Summary			
HCM Average Control Delay	142.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Frt	0.94		1.00	0.85	1.00	1.00
Flt Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1671		3471	1553	1736	3471
Flt Permitted	0.97		1.00	1.00	0.06	1.00
Satd. Flow (perm)	1671		3471	1553	116	3471
Volume (vph)	345	273	1552	345	376	2144
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	297	1687	375	409	2330
RTOR Reduction (vph)	20	0	0	98	0	0
Lane Group Flow (vph)	652	0	1687	277	409	2330
Turn Type				Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	43.0		57.0	57.0	85.0	85.0
Effective Green, g (s)	45.0		59.0	59.0	87.0	87.0
Actuated g/C Ratio	0.32		0.42	0.42	0.62	0.62
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)	537		1463	654	350	2157
v/s Ratio Prot	c0.39		0.49		c0.20	0.67
v/s Ratio Perm				0.18	c0.53	
v/c Ratio	1.21		1.15	0.42	1.17	1.08
Uniform Delay, d1	47.5		40.5	28.5	60.2	26.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	112.4		77.2	2.0	102.3	45.1
Delay (s)	159.9		117.7	30.5	162.5	71.6
Level of Service	F		F	C	F	E
Approach Delay (s)	159.9		101.8			85.2
Approach LOS	F		F			F

Intersection Summary			
HCM Average Control Delay	100.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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)	3367	1553	3471	1553	1736	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.05	1.00
Satd. Flow (perm)	3367	1553	3471	1553	85	3471
Volume (vph)	345	376	2144	345	276	1552
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	409	2330	375	300	1687
RTOR Reduction (vph)	0	152	0	76	0	0
Lane Group Flow (vph)	375	257	2330	299	300	1687
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	17.0	17.0	80.0	80.0	101.0	101.0
Effective Green, g (s)	19.0	19.0	82.0	82.0	103.0	103.0
Actuated g/C Ratio	0.15	0.15	0.63	0.63	0.79	0.79
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)	492	227	2189	980	283	2750
v/s Ratio Prot	0.11		0.67		c0.14	0.49
v/s Ratio Perm		c0.17		0.19	c0.70	
v/c Ratio	0.76	1.13	1.06	0.31	1.06	0.61
Uniform Delay, d1	53.3	55.5	24.0	11.0	58.7	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.9	99.9	39.1	0.8	70.2	0.4
Delay (s)	60.2	155.4	63.1	11.8	128.9	5.9
Level of Service	E	F	E	B	F	A
Approach Delay (s)	109.9		56.0			24.4
Approach LOS	F		E			C

Intersection Summary			
HCM Average Control Delay	52.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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)	3367	1553	3471	1553	1736	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.09	1.00
Satd. Flow (perm)	3367	1553	3471	1553	170	3471
Volume (vph)	345	273	1552	345	376	2144
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	297	1687	375	409	2330
RTOR Reduction (vph)	0	258	0	180	0	0
Lane Group Flow (vph)	375	39	1687	195	409	2330
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	7.0	7.0	37.0	37.0	56.0	56.0
Effective Green, g (s)	9.0	9.0	39.0	39.0	58.0	58.0
Actuated g/C Ratio	0.12	0.12	0.52	0.52	0.77	0.77
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)	404	186	1805	808	445	2684
v/s Ratio Prot	c0.11		0.49		0.18	c0.67
v/s Ratio Perm		0.03		0.13	c0.53	
v/c Ratio	0.93	0.21	0.93	0.24	0.92	0.87
Uniform Delay, d1	32.7	29.8	16.8	9.9	22.7	5.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.3	0.6	10.5	0.7	23.8	3.2
Delay (s)	59.9	30.4	27.3	10.6	46.4	9.1
Level of Service	E	C	C	B	D	A
Approach Delay (s)	46.9		24.3			14.7
Approach LOS	D		C			B

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	18	26	2150	1557	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	20	28	2337	1692	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.47					
vC, conflicting volume	2927	856	1712			
vC1, stage 1 conf vol	1702					
vC2, stage 2 conf vol	1225					
vCu, unblocked vol	3989	856	1712			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	93	92			
cM capacity (veh/h)	112	297	358			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	39	28	1168	1168	1128	584
Volume Left	20	28	0	0	0	0
Volume Right	20	0	0	0	0	20
cSH	163	358	1700	1700	1700	1700
Volume to Capacity	0.24	0.08	0.69	0.69	0.66	0.34
Queue Length 95th (ft)	22	6	0	0	0	0
Control Delay (s)	34.0	15.9	0.0	0.0	0.0	0.0
Lane LOS	D	C				
Approach Delay (s)	34.0	0.2			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	18	26	2150	1557	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	20	28	2337	1692	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.39					
vC, conflicting volume	2927	856	1712			
vC1, stage 1 conf vol	1702					
vC2, stage 2 conf vol	1225					
vCu, unblocked vol	4352	856	1712			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	93	92			
cM capacity (veh/h)	116	297	358			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	39	28	1168	1168	1128	584
Volume Left	20	28	0	0	0	0
Volume Right	20	0	0	0	0	20
cSH	166	358	1700	1700	1700	1700
Volume to Capacity	0.24	0.08	0.69	0.69	0.66	0.34
Queue Length 95th (ft)	22	6	0	0	0	0
Control Delay (s)	33.2	15.9	0.0	0.0	0.0	0.0
Lane LOS	D	C				
Approach Delay (s)	33.2	0.2			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	27	0	2176	1557	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	2365	1692	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.39					
vC, conflicting volume	2885	856	1712			
vC1, stage 1 conf vol	1702					
vC2, stage 2 conf vol	1183					
vCu, unblocked vol	4251	856	1712			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	118	297	358			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	29	1183	1183	1128	584
Volume Left	0	0	0	0	0
Volume Right	29	0	0	0	20
cSH	297	1700	1700	1700	1700
Volume to Capacity	0.10	0.70	0.70	0.66	0.34
Queue Length 95th (ft)	8	0	0	0	0
Control Delay (s)	18.4	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	18.4	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	26	18	1557	2150	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	28	20	1692	2337	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.59					
vC, conflicting volume	3232	1178	2357			
vC1, stage 1 conf vol	2347					
vC2, stage 2 conf vol	885					
vCu, unblocked vol	4104	1178	2357			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	84	90			
cM capacity (veh/h)	54	180	199			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	48	20	846	846	1558	799
Volume Left	20	20	0	0	0	0
Volume Right	28	0	0	0	0	20
cSH	93	199	1700	1700	1700	1700
Volume to Capacity	0.52	0.10	0.50	0.50	0.92	0.47
Queue Length 95th (ft)	57	8	0	0	0	0
Control Delay (s)	79.5	25.1	0.0	0.0	0.0	0.0
Lane LOS	F	D				
Approach Delay (s)	79.5	0.3			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	26	18	1557	2150	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	28	20	1692	2337	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.61					
vC, conflicting volume	3232	1178	2357			
vC1, stage 1 conf vol	2347					
vC2, stage 2 conf vol	885					
vCu, unblocked vol	4008	1178	2357			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	84	90			
cM capacity (veh/h)	54	180	199			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	48	20	846	846	1558	799
Volume Left	20	20	0	0	0	0
Volume Right	28	0	0	0	0	20
cSH	93	199	1700	1700	1700	1700
Volume to Capacity	0.52	0.10	0.50	0.50	0.92	0.47
Queue Length 95th (ft)	57	8	0	0	0	0
Control Delay (s)	79.6	25.1	0.0	0.0	0.0	0.0
Lane LOS	F	D				
Approach Delay (s)	79.6	0.3			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	35	0	1575	2150	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	38	0	1712	2337	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.61					
vC, conflicting volume	3203	1178	2357			
vC1, stage 1 conf vol	2347					
vC2, stage 2 conf vol	856					
vCu, unblocked vol	3971	1178	2357			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	79	100			
cM capacity (veh/h)	55	180	199			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	856	856	1558	799
Volume Left	0	0	0	0	0
Volume Right	38	0	0	0	20
cSH	180	1700	1700	1700	1700
Volume to Capacity	0.21	0.50	0.50	0.92	0.47
Queue Length 95th (ft)	19	0	0	0	0
Control Delay (s)	30.2	0.0	0.0	0.0	0.0
Lane LOS	D				
Approach Delay (s)	30.2	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	23	32	2488	1802	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	25	35	2704	1959	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.51					
vC, conflicting volume	3393	992	1984			
vC1, stage 1 conf vol	1971					
vC2, stage 2 conf vol	1422					
vCu, unblocked vol	4711	992	1984			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	90	88			
cM capacity (veh/h)	75	241	280			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	50	35	1352	1352	1306	678
Volume Left	25	35	0	0	0	0
Volume Right	25	0	0	0	0	25
cSH	114	280	1700	1700	1700	1700
Volume to Capacity	0.44	0.12	0.80	0.80	0.77	0.40
Queue Length 95th (ft)	47	11	0	0	0	0
Control Delay (s)	59.1	19.7	0.0	0.0	0.0	0.0
Lane LOS	F	C				
Approach Delay (s)	59.1	0.3			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	23	32	2488	1802	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	25	35	2704	1959	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.38					
vC, conflicting volume	3393	992	1984			
vC1, stage 1 conf vol	1971					
vC2, stage 2 conf vol	1422					
vCu, unblocked vol	5700	992	1984			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	68	90	88			
cM capacity (veh/h)	78	241	280			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	50	35	1352	1352	1306	678
Volume Left	25	35	0	0	0	0
Volume Right	25	0	0	0	0	25
cSH	118	280	1700	1700	1700	1700
Volume to Capacity	0.42	0.12	0.80	0.80	0.77	0.40
Queue Length 95th (ft)	45	11	0	0	0	0
Control Delay (s)	56.3	19.7	0.0	0.0	0.0	0.0
Lane LOS	F	C				
Approach Delay (s)	56.3	0.3			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	46	0	2520	1802	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	50	0	2739	1959	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.38					
vC, conflicting volume	3341	992	1984			
vC1, stage 1 conf vol	1971					
vC2, stage 2 conf vol	1370					
vCu, unblocked vol	5561	992	1984			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	79	100			
cM capacity (veh/h)	82	241	280			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	50	1370	1370	1306	678
Volume Left	0	0	0	0	0
Volume Right	50	0	0	0	25
cSH	241	1700	1700	1700	1700
Volume to Capacity	0.21	0.81	0.81	0.77	0.40
Queue Length 95th (ft)	19	0	0	0	0
Control Delay (s)	23.8	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	23.8	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	32	23	1802	2488	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	35	25	1959	2704	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.59					
vC, conflicting volume	3746	1365	2729			
vC1, stage 1 conf vol	2717					
vC2, stage 2 conf vol	1029					
vCu, unblocked vol	4983	1365	2729			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	25	74	82			
cM capacity (veh/h)	33	135	140			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	60	25	979	979	1803	926
Volume Left	25	25	0	0	0	0
Volume Right	35	0	0	0	0	25
cSH	59	140	1700	1700	1700	1700
Volume to Capacity	1.01	0.18	0.58	0.58	1.06	0.54
Queue Length 95th (ft)	119	16	0	0	0	0
Control Delay (s)	233.1	36.1	0.0	0.0	0.0	0.0
Lane LOS	F	E				
Approach Delay (s)	233.1	0.5			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	32	23	1802	2488	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	35	25	1959	2704	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.52					
vC, conflicting volume	3746	1365	2729			
vC1, stage 1 conf vol	2717					
vC2, stage 2 conf vol	1029					
vCu, unblocked vol	5387	1365	2729			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	25	74	82			
cM capacity (veh/h)	33	135	140			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	60	25	979	979	1803	926
Volume Left	25	25	0	0	0	0
Volume Right	35	0	0	0	0	25
cSH	59	140	1700	1700	1700	1700
Volume to Capacity	1.01	0.18	0.58	0.58	1.06	0.54
Queue Length 95th (ft)	119	16	0	0	0	0
Control Delay (s)	232.4	36.1	0.0	0.0	0.0	0.0
Lane LOS	F	E				
Approach Delay (s)	232.4	0.5			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	32	0	1825	2488	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	35	0	1984	2704	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)				598		
pX, platoon unblocked	0.51					
vC, conflicting volume	3709	1365	2729			
vC1, stage 1 conf vol	2717					
vC2, stage 2 conf vol	992					
vCu, unblocked vol	5322	1365	2729			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	74	100			
cM capacity (veh/h)	34	135	140			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	992	992	1803	926
Volume Left	0	0	0	0	0
Volume Right	35	0	0	0	25
cSH	135	1700	1700	1700	1700
Volume to Capacity	0.26	0.58	0.58	1.06	0.54
Queue Length 95th (ft)	24	0	0	0	0
Control Delay (s)	40.7	0.0	0.0	0.0	0.0
Lane LOS	E				
Approach Delay (s)	40.7	0.0		0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1529	23	32	2121	23	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1662	25	35	2305	25	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)				598		
pX, platoon unblocked					0.71	
vC, conflicting volume			1687		2512	566
vC1, stage 1 conf vol					1674	
vC2, stage 2 conf vol					838	
vCu, unblocked vol			1687		1708	566
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		78	95
cM capacity (veh/h)			366		114	462

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3	NE 1
Volume Total	665	665	357	496	922	922	50
Volume Left	0	0	0	35	0	0	25
Volume Right	0	0	25	0	0	0	25
cSH	1700	1700	1700	366	1700	1700	183
Volume to Capacity	0.39	0.39	0.21	0.10	0.54	0.54	0.27
Queue Length 95th (ft)	0	0	0	8	0	0	27
Control Delay (s)	0.0	0.0	0.0	3.0	0.0	0.0	32.0
Lane LOS				A			D
Approach Delay (s)	0.0			0.6			32.0
Approach LOS							D

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (vph)	2121	322	23	1529	313	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	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)	4988	1553	1736	4988	3367	1553
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	4988	1553	101	4988	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2305	350	25	1662	340	35
RTOR Reduction (vph)	0	112	0	0	0	29
Lane Group Flow (vph)	2305	238	25	1662	340	6
Turn Type		Perm	pm+pt			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	66.0	66.0	73.6	73.6	14.4	14.4
Effective Green, g (s)	68.0	68.0	75.6	75.6	16.4	16.4
Actuated g/C Ratio	0.68	0.68	0.76	0.76	0.16	0.16
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)	3392	1056	135	3771	552	255
v/s Ratio Prot	c0.46		0.01	c0.33	c0.10	
v/s Ratio Perm		0.15	0.13			0.00
v/c Ratio	0.68	0.23	0.19	0.44	0.62	0.02
Uniform Delay, d1	9.5	6.0	7.7	4.5	38.9	35.1
Progression Factor	0.52	0.12	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.4	0.7	0.4	2.0	0.0
Delay (s)	5.8	1.1	8.4	4.8	40.9	35.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	5.2			4.9	40.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	45	2450	45	32	1774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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)	1736	1553	4988	1553	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.05	1.00
Satd. Flow (perm)	1736	1553	4988	1553	90	4988
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	49	2663	49	35	1928
RTOR Reduction (vph)	0	46	0	11	0	0
Lane Group Flow (vph)	49	3	2663	38	35	1928
Turn Type		Prot		Perm	pm+pt	
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	4.0	4.0	75.6	75.6	84.0	84.0
Effective Green, g (s)	6.0	6.0	77.6	77.6	86.0	86.0
Actuated g/C Ratio	0.06	0.06	0.78	0.78	0.86	0.86
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)	104	93	3871	1205	150	4290
v/s Ratio Prot	c0.03	0.00	c0.53		0.01	c0.39
v/s Ratio Perm				0.02	0.19	
v/c Ratio	0.47	0.03	0.69	0.03	0.23	0.45
Uniform Delay, d1	45.5	44.3	5.4	2.6	9.3	1.6
Progression Factor	1.00	1.00	1.00	1.00	1.17	0.79
Incremental Delay, d2	3.3	0.1	1.0	0.0	0.7	0.3
Delay (s)	48.8	44.4	6.4	2.6	11.6	1.6
Level of Service	D	D	A	A	B	A
Approach Delay (s)	46.6		6.3			1.7
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	5.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	2121	23	23	1529	23	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2305	25	25	1662	25	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)				598		
pX, platoon unblocked					0.84	
vC, conflicting volume			2330		2922	781
vC1, stage 1 conf vol					2318	
vC2, stage 2 conf vol					604	
vCu, unblocked vol			2330		2631	781
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			88		51	90
cM capacity (veh/h)			203		51	333

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3	NE 1
Volume Total	922	922	486	357	665	665	60
Volume Left	0	0	0	25	0	0	25
Volume Right	0	0	25	0	0	0	35
cSH	1700	1700	1700	203	1700	1700	101
Volume to Capacity	0.54	0.54	0.29	0.12	0.39	0.39	0.59
Queue Length 95th (ft)	0	0	0	10	0	0	71
Control Delay (s)	0.0	0.0	0.0	5.3	0.0	0.0	83.0
Lane LOS				A			F
Approach Delay (s)	0.0			1.1			83.0
Approach LOS							F

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (vph)	1529	313	32	2121	322	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	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)	4988	1553	1736	4988	3367	1553
Flt Permitted	1.00	1.00	0.11	1.00	0.95	1.00
Satd. Flow (perm)	4988	1553	194	4988	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1662	340	35	2305	350	25
RTOR Reduction (vph)	0	106	0	0	0	21
Lane Group Flow (vph)	1662	234	35	2305	350	4
Turn Type		Perm	pm+pt			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	80.5	80.5	90.3	90.3	17.7	17.7
Effective Green, g (s)	82.5	82.5	92.3	92.3	19.7	19.7
Actuated g/C Ratio	0.69	0.69	0.77	0.77	0.16	0.16
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)	3429	1068	224	3837	553	255
v/s Ratio Prot	0.33		0.01	c0.46	c0.10	
v/s Ratio Perm		0.15	0.11			0.00
v/c Ratio	0.48	0.22	0.16	0.60	0.63	0.02
Uniform Delay, d1	8.8	6.9	5.0	5.9	46.8	42.0
Progression Factor	0.46	0.10	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.3	0.7	2.4	0.0
Delay (s)	4.5	1.1	5.4	6.6	49.1	42.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.9			6.6	48.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Realigned Tram Rd & US 98

7/16/2007

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	32	1774	45	45	2450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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)	1736	1553	4988	1553	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.09	1.00
Satd. Flow (perm)	1736	1553	4988	1553	160	4988
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	35	1928	49	49	2663
RTOR Reduction (vph)	0	32	0	11	0	0
Lane Group Flow (vph)	49	3	1928	38	49	2663
Turn Type		Prot		Perm	pm+pt	
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	7.2	7.2	90.0	90.0	100.8	100.8
Effective Green, g (s)	9.2	9.2	92.0	92.0	102.8	102.8
Actuated g/C Ratio	0.08	0.08	0.77	0.77	0.86	0.86
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)	133	119	3824	1191	226	4273
v/s Ratio Prot	c0.03	0.00	0.39		0.01	c0.53
v/s Ratio Perm				0.02	0.17	
v/c Ratio	0.37	0.02	0.50	0.03	0.22	0.62
Uniform Delay, d1	52.6	51.2	5.3	3.3	5.5	2.6
Progression Factor	1.00	1.00	1.00	1.00	0.49	0.48
Incremental Delay, d2	1.7	0.1	0.5	0.0	0.4	0.6
Delay (s)	54.4	51.3	5.8	3.4	3.1	1.8
Level of Service	D	D	A	A	A	A
Approach Delay (s)	53.1		5.7			1.9
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1751	28	38	2428	28	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1903	30	41	2639	30	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)				598		
pX, platoon unblocked					0.61	
vC, conflicting volume			1934		2881	650
vC1, stage 1 conf vol					1918	
vC2, stage 2 conf vol					962	
vCu, unblocked vol			1934		1862	650
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			86		63	93
cM capacity (veh/h)			293		83	407

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3	NE 1
Volume Total	761	761	411	569	1056	1056	61
Volume Left	0	0	0	41	0	0	30
Volume Right	0	0	30	0	0	0	30
cSH	1700	1700	1700	293	1700	1700	138
Volume to Capacity	0.45	0.45	0.24	0.14	0.62	0.62	0.44
Queue Length 95th (ft)	0	0	0	12	0	0	49
Control Delay (s)	0.0	0.0	0.0	5.1	0.0	0.0	50.2
Lane LOS				A			F
Approach Delay (s)	0.0			1.1			50.2
Approach LOS							F

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (vph)	2428	380	28	1751	370	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	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)	4988	1553	1736	4988	3367	1553
Flt Permitted	1.00	1.00	0.05	1.00	0.95	1.00
Satd. Flow (perm)	4988	1553	93	4988	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2639	413	30	1903	402	41
RTOR Reduction (vph)	0	132	0	0	0	34
Lane Group Flow (vph)	2639	281	30	1903	402	7
Turn Type		Perm	pm+pt			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	72.8	72.8	81.2	81.2	16.8	16.8
Effective Green, g (s)	74.8	74.8	83.2	83.2	18.8	18.8
Actuated g/C Ratio	0.68	0.68	0.76	0.76	0.17	0.17
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)	3392	1056	136	3773	575	265
v/s Ratio Prot	c0.53		0.01	c0.38	c0.12	
v/s Ratio Perm		0.18	0.16			0.00
v/c Ratio	0.78	0.27	0.22	0.50	0.70	0.03
Uniform Delay, d1	12.0	6.9	12.3	5.3	42.9	38.0
Progression Factor	0.45	0.09	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.4	0.8	0.5	3.7	0.0
Delay (s)	6.6	1.0	13.1	5.8	46.6	38.0
Level of Service	A	A	B	A	D	D
Approach Delay (s)	5.9			5.9	45.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Realigned Tram Rd & US 98

7/16/2007

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	51	37	2042	51	51	2820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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)	1736	1553	4988	1553	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.06	1.00
Satd. Flow (perm)	1736	1553	4988	1553	112	4988
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	40	2220	55	55	3065
RTOR Reduction (vph)	0	37	0	12	0	0
Lane Group Flow (vph)	55	3	2220	43	55	3065
Turn Type		Prot		Perm	pm+pt	
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	6.9	6.9	91.9	91.9	101.1	101.1
Effective Green, g (s)	8.9	8.9	93.9	93.9	103.1	103.1
Actuated g/C Ratio	0.07	0.07	0.78	0.78	0.86	0.86
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)	129	115	3903	1215	167	4286
v/s Ratio Prot	c0.03	0.00	0.45		0.01	c0.61
v/s Ratio Perm				0.03	0.27	
v/c Ratio	0.43	0.03	0.57	0.04	0.33	0.72
Uniform Delay, d1	53.1	51.5	5.1	2.9	8.3	3.1
Progression Factor	1.00	1.00	1.00	1.00	0.73	0.40
Incremental Delay, d2	2.3	0.1	0.6	0.1	0.8	0.8
Delay (s)	55.4	51.6	5.7	3.0	6.9	2.0
Level of Service	E	D	A	A	A	A
Approach Delay (s)	53.8		5.7			2.1
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	4.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	2428	28	28	1751	28	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2639	30	30	1903	30	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)				598		
pX, platoon unblocked					0.80	
vC, conflicting volume			2670		3350	895
vC1, stage 1 conf vol					2654	
vC2, stage 2 conf vol					695	
vCu, unblocked vol			2670		3053	895
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			80		7	85
cM capacity (veh/h)			149		33	280

Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3	NE 1
Volume Total	1056	1056	558	411	761	761	72
Volume Left	0	0	0	30	0	0	30
Volume Right	0	0	30	0	0	0	41
cSH	1700	1700	1700	149	1700	1700	67
Volume to Capacity	0.62	0.62	0.33	0.20	0.45	0.45	1.07
Queue Length 95th (ft)	0	0	0	18	0	0	138
Control Delay (s)	0.0	0.0	0.0	11.3	0.0	0.0	237.4
Lane LOS				B			F
Approach Delay (s)	0.0			2.4			237.4
Approach LOS							F

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Realigned Tram Rd & US 98

7/16/2007

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	51	51	2820	51	37	2042
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
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)	1736	1553	4988	1553	1736	4988
Flt Permitted	0.95	1.00	1.00	1.00	0.04	1.00
Satd. Flow (perm)	1736	1553	4988	1553	81	4988
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	55	3065	55	40	2220
RTOR Reduction (vph)	0	51	0	12	0	0
Lane Group Flow (vph)	55	4	3065	43	40	2220
Turn Type		Prot		Perm	pm+pt	
Protected Phases	8	8	2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	5.6	5.6	84.0	84.0	92.4	92.4
Effective Green, g (s)	7.6	7.6	86.0	86.0	94.4	94.4
Actuated g/C Ratio	0.07	0.07	0.78	0.78	0.86	0.86
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)	120	107	3900	1214	136	4281
v/s Ratio Prot	c0.03	0.00	c0.61		0.01	c0.45
v/s Ratio Perm				0.03	0.24	
v/c Ratio	0.46	0.04	0.79	0.04	0.29	0.52
Uniform Delay, d1	49.2	47.8	6.8	2.7	17.1	2.0
Progression Factor	1.00	1.00	1.00	1.00	1.11	0.72
Incremental Delay, d2	2.8	0.1	1.7	0.1	1.0	0.4
Delay (s)	52.0	47.9	8.5	2.7	20.0	1.8
Level of Service	D	D	A	A	C	A
Approach Delay (s)	49.9		8.4			2.1
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (vph)	1751	370	38	2428	380	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	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)	4988	1553	1736	4988	3367	1553
Flt Permitted	1.00	1.00	0.07	1.00	0.95	1.00
Satd. Flow (perm)	4988	1553	136	4988	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1903	402	41	2639	413	30
RTOR Reduction (vph)	0	132	0	0	0	25
Lane Group Flow (vph)	1903	270	41	2639	413	5
Turn Type		Perm	pm+pt			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	78.7	78.7	88.7	88.7	19.3	19.3
Effective Green, g (s)	80.7	80.7	90.7	90.7	21.3	21.3
Actuated g/C Ratio	0.67	0.67	0.76	0.76	0.18	0.18
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)	3354	1044	183	3770	598	276
v/s Ratio Prot	0.38		0.01	c0.53	c0.12	
v/s Ratio Perm		0.17	0.16			0.00
v/c Ratio	0.57	0.26	0.22	0.70	0.69	0.02
Uniform Delay, d1	10.4	7.8	6.9	7.6	46.3	40.7
Progression Factor	0.52	0.10	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.6	1.1	3.4	0.0
Delay (s)	6.0	1.3	7.6	8.7	49.7	40.8
Level of Service	A	A	A	A	D	D
Approach Delay (s)	5.2			8.7	49.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C
SimTraffic Queuing Reports

Intersection: 4: Tram Road & US 98

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	558	521	512	1609	1628	1609	416	245	178
Average Queue (ft)	321	311	273	1349	1348	1271	259	109	93
95th Queue (ft)	554	537	489	1955	1957	1991	391	189	164
Link Distance (ft)	1781	1781	1781	1594	1594	1594	530	530	530
Upstream Blk Time (%)				18	16	8			
Queuing Penalty (veh)				0	0	0			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 5: 14th Street & US 98

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	70	15
Average Queue (ft)	27	1
95th Queue (ft)	50	5
Link Distance (ft)	702	853
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Nework Summary

Network wide Queuing Penalty: 0

Intersection: 4: Tram Road & US 98

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	713	698	724	848	844	810	463	501	410
Average Queue (ft)	438	438	359	567	548	290	238	215	184
95th Queue (ft)	711	717	748	880	860	762	436	353	289
Link Distance (ft)	1781	1781	1781	1594	1594	1594	530	530	530
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 5: 14th Street & US 98

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	195	766	763
Average Queue (ft)	36	127	180
95th Queue (ft)	105	458	558
Link Distance (ft)	702	853	853
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Nework Summary

Network wide Queuing Penalty: 0

Intersection: 1: Realigned Tram Rd & US 98

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T
Maximum Queue (ft)	108	106	174	405	437	31	75	29	47
Average Queue (ft)	51	44	75	115	160	6	32	4	12
95th Queue (ft)	101	100	162	268	356	24	67	20	35
Link Distance (ft)	0		0	0	0			0	0
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		450				250	350		
Storage Blk Time (%)					2				
Queuing Penalty (veh)					1				

Intersection: 2: US 98 & GCP

Movement	NB	NB	NB	NB	SB	SB	SB	SB	SW	SW	SW
Directions Served	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (ft)	196	183	242	81	53	119	155	221	349	542	51
Average Queue (ft)	95	107	133	37	21	63	91	126	216	251	23
95th Queue (ft)	163	181	209	77	48	99	132	193	364	446	52
Link Distance (ft)	0	0	0			0	0	0		0	0
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)				325	350				300		
Storage Blk Time (%)									9	12	
Queuing Penalty (veh)									17	22	

Intersection: 3: US 98 & 14th Street

Movement	NE
Directions Served	R
Maximum Queue (ft)	64
Average Queue (ft)	36
95th Queue (ft)	59
Link Distance (ft)	0
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: US 98 &

Movement	EB	EB	WB	WB	WB	SW
Directions Served	T	TR	T	T	T	R
Maximum Queue (ft)	168	205	351	366	375	1030
Average Queue (ft)	14	71	33	65	101	404
95th Queue (ft)	84	169	181	230	246	902
Link Distance (ft)	0	0	0	0	0	0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: GCP &

Movement	EB	WB	NE
Directions Served	T	TR	R
Maximum Queue (ft)	52	56	122
Average Queue (ft)	2	14	10
95th Queue (ft)	21	47	63
Link Distance (ft)	0	0	0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Realigned Tram Rd &

Movement	EB	SW
Directions Served	<L	R>
Maximum Queue (ft)	57	78
Average Queue (ft)	37	41
95th Queue (ft)	53	68
Link Distance (ft)	0	0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 40

Intersection: 1: Realigned Tram Rd & US 98

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	T	R	L	T	T	T
Maximum Queue (ft)	133	89	120	156	215	62	95	108	31	74
Average Queue (ft)	50	19	47	67	102	11	37	5	11	21
95th Queue (ft)	102	57	107	145	197	40	77	25	34	54
Link Distance (ft)	2413		1044	1044	1044			606	606	606
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		450				250	350			
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: US 98 & GCP

Movement	NB	NB	NB	NB	SB	SB	SB	SB	SW	SW	SW
Directions Served	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (ft)	156	158	221	76	97	243	263	328	224	268	70
Average Queue (ft)	74	76	99	35	26	118	157	210	146	161	19
95th Queue (ft)	129	131	161	67	66	199	244	314	219	239	48
Link Distance (ft)	606	606	606			493	493	493		1356	1356
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)				325	350				300		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 3: US 98 & 14th Street

Movement	NE
Directions Served	R
Maximum Queue (ft)	74
Average Queue (ft)	35
95th Queue (ft)	67
Link Distance (ft)	498
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: US 98 &

Movement	EB	EB	WB	WB	SW
Directions Served	T	TR	T	T	R
Maximum Queue (ft)	404	460	113	116	271
Average Queue (ft)	90	170	4	27	133
95th Queue (ft)	301	334	39	77	231
Link Distance (ft)	2253	2253	983	983	2518
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: GCP &

Movement	EB	WB	NE
Directions Served	T	TR	R
Maximum Queue (ft)	22	75	95
Average Queue (ft)	1	11	19
95th Queue (ft)	10	42	67
Link Distance (ft)	1356	1538	1391
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Realigned Tram Rd &

Movement	EB	SW
Directions Served	<L	R>
Maximum Queue (ft)	73	89
Average Queue (ft)	38	35
95th Queue (ft)	69	63
Link Distance (ft)	2413	610
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Appendix D
Concept Drawings Showing Suggested Improvements

PBSJ

Tram Road Inital
Tram Road and US 98 Intersection

FIGURE
2

T-Plang-GulfCoastPkwy-graphics-gcpLanes-7/30/07-cp

PBSJ

Tram Road Modified Alternative 2
Tram Road and US 98 Intersection

FIGURE
2

T-Plang-GulfCoastPkwy-graphics-gcpLanes-7/30/07-cp

APPENDIX F
SYNCHRO HCM INTERSECTION CAPACITY ANALYSIS REPORTS AND QUEUING AND BLOCKING REPORTS

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	480	120	120	111	153	664
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	522	130	130	121	166	722
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	909	527	888			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	909	527	888			
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	76	83			
cM capacity (veh/h)	251	547	754			

Direction, Lane #	SB 1	SB 2	SE 1	NW 1
Volume Total	522	130	251	888
Volume Left	522	0	130	0
Volume Right	0	130	0	722
cSH	251	547	754	1700
Volume to Capacity	2.08	0.24	0.17	0.52
Queue Length 95th (ft)	973	23	16	0
Control Delay (s)	532.7	13.6	6.6	0.0
Lane LOS	F	B	A	
Approach Delay (s)	428.9		6.6	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	157.1		
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	664	120	120	153	111	480
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	722	130	130	166	121	522
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	809	382	642			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	809	382	642			
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	80	86			
cM capacity (veh/h)	299	661	933			

Direction, Lane #	SB 1	SB 2	SE 1	NW 1
Volume Total	722	130	297	642
Volume Left	722	0	130	0
Volume Right	0	130	0	522
cSH	299	661	933	1700
Volume to Capacity	2.42	0.20	0.14	0.38
Queue Length 95th (ft)	1440	18	12	0
Control Delay (s)	674.4	11.8	5.0	0.0
Lane LOS	F	B	A	
Approach Delay (s)	572.9		5.0	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	273.4		
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	480	120	120	111	153	664
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.97			1.00	1.00	
Frt	0.97			1.00	0.89	
Flt Protected	0.96			0.97	1.00	
Satd. Flow (prot)	3306			1781	1626	
Flt Permitted	0.96			0.27	1.00	
Satd. Flow (perm)	3306			491	1626	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	130	130	121	166	722
RTOR Reduction (vph)	55	0	0	0	340	0
Lane Group Flow (vph)	597	0	0	251	548	0
Turn Type			Perm			
Protected Phases	4			6	2	
Permitted Phases			6			
Actuated Green, G (s)	7.1			17.2	17.2	
Effective Green, g (s)	9.1			19.2	19.2	
Actuated g/C Ratio	0.25			0.53	0.53	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	829			260	860	
v/s Ratio Prot	c0.18				0.34	
v/s Ratio Perm				c0.51		
v/c Ratio	0.72			0.97	0.64	
Uniform Delay, d1	12.4			8.2	6.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.1			45.8	1.6	
Delay (s)	15.5			54.1	7.6	
Level of Service	B			D	A	
Approach Delay (s)	15.5			54.1	7.6	
Approach LOS	B			D	A	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	36.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	664	120	120	153	111	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.97			1.00	1.00	
Frt	0.98			1.00	0.89	
Flt Protected	0.96			0.98	1.00	
Satd. Flow (prot)	3322			1788	1627	
Flt Permitted	0.96			0.42	1.00	
Satd. Flow (perm)	3322			765	1627	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	722	130	130	166	121	522
RTOR Reduction (vph)	32	0	0	0	280	0
Lane Group Flow (vph)	820	0	0	296	363	0
Turn Type			Perm			
Protected Phases	4			6	2	
Permitted Phases			6			
Actuated Green, G (s)	11.7			16.8	16.8	
Effective Green, g (s)	13.7			18.8	18.8	
Actuated g/C Ratio	0.34			0.46	0.46	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1124			355	755	
v/s Ratio Prot	c0.25				0.22	
v/s Ratio Perm				c0.39		
v/c Ratio	0.73			0.83	0.48	
Uniform Delay, d1	11.8			9.5	7.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.4			15.4	0.5	
Delay (s)	14.2			24.8	8.0	
Level of Service	B			C	A	
Approach Delay (s)	14.2			24.8	8.0	
Approach LOS	B			C	A	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	120	111	153	664	480	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	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)	1736	1827	1827	1553	3367	1553
Flt Permitted	0.49	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	901	1827	1827	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	121	166	722	522	130
RTOR Reduction (vph)	0	0	0	301	0	97
Lane Group Flow (vph)	130	121	166	421	522	33
Turn Type	pm+pt			custom		Perm
Protected Phases	1	6	2	2	8	
Permitted Phases	6			8		8
Actuated Green, G (s)	19.4	19.4	10.4	18.6	8.2	8.2
Effective Green, g (s)	21.4	21.4	12.4	22.6	10.2	10.2
Actuated g/C Ratio	0.54	0.54	0.31	0.57	0.26	0.26
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)	592	987	572	1043	867	400
v/s Ratio Prot	c0.03	0.07	0.09	c0.13	c0.16	
v/s Ratio Perm	0.09			0.14		0.02
v/c Ratio	0.22	0.12	0.29	0.40	0.60	0.08
Uniform Delay, d1	4.7	4.5	10.3	4.7	12.9	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.3	0.3	1.2	0.1
Delay (s)	4.9	4.5	10.6	5.0	14.1	11.2
Level of Service	A	A	B	A	B	B
Approach Delay (s)		4.7	6.0		13.5	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	39.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	120	153	111	480	664	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	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)	1736	1827	1827	1553	3367	1553
Flt Permitted	0.48	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	881	1827	1827	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	166	121	522	722	130
RTOR Reduction (vph)	0	0	0	234	0	92
Lane Group Flow (vph)	130	166	121	288	722	38
Turn Type	pm+pt			custom		Perm
Protected Phases	1	6	2	2	8	
Permitted Phases	6			8		8
Actuated Green, G (s)	16.8	16.8	7.8	16.9	9.1	9.1
Effective Green, g (s)	18.8	18.8	9.8	20.9	11.1	11.1
Actuated g/C Ratio	0.50	0.50	0.26	0.55	0.29	0.29
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)	550	906	472	1020	986	455
v/s Ratio Prot	c0.03	0.09	0.07	c0.07	c0.21	
v/s Ratio Perm	0.09			0.11		0.02
v/c Ratio	0.24	0.18	0.26	0.28	0.73	0.08
Uniform Delay, d1	5.4	5.3	11.2	4.5	12.1	9.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.3	0.2	2.8	0.1
Delay (s)	5.7	5.4	11.4	4.7	14.9	9.8
Level of Service	A	A	B	A	B	A
Approach Delay (s)		5.5	5.9		14.1	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	37.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	337	83	115	19	14	337
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	366	90	125	21	15	366
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	146				958	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	146				958	135
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	74				93	60
cM capacity (veh/h)	1424				210	908

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	457	146	382
Volume Left	366	0	15
Volume Right	0	21	366
cSH	1424	1700	802
Volume to Capacity	0.26	0.09	0.48
Queue Length 95th (ft)	26	0	65
Control Delay (s)	7.2	0.0	13.5
Lane LOS	A		B
Approach Delay (s)	7.2	0.0	13.5
Approach LOS			B

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	337	115	83	14	19	337
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	366	125	90	15	21	366
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	105				955	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105				955	98
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	75				90	62
cM capacity (veh/h)	1473				213	953

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	491	105	387
Volume Left	366	0	21
Volume Right	0	15	366
cSH	1473	1700	804
Volume to Capacity	0.25	0.06	0.48
Queue Length 95th (ft)	25	0	66
Control Delay (s)	6.7	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	6.7	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	337	83	115	19	14	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.98		0.87	
Flt Protected		0.96	1.00		1.00	
Satd. Flow (prot)		1756	1791		1587	
Flt Permitted		0.67	1.00		1.00	
Satd. Flow (perm)		1229	1791		1587	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	366	90	125	21	15	366
RTOR Reduction (vph)	0	0	10	0	294	0
Lane Group Flow (vph)	0	456	136	0	87	0
Turn Type	Perm					
Protected Phases		4	4		6	
Permitted Phases	4					
Actuated Green, G (s)		20.2	20.2		7.9	
Effective Green, g (s)		20.2	20.2		7.9	
Actuated g/C Ratio		0.50	0.50		0.20	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		619	902		313	
v/s Ratio Prot			0.08		c0.05	
v/s Ratio Perm		c0.37				
v/c Ratio		0.74	0.15		0.28	
Uniform Delay, d1		7.9	5.3		13.7	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		4.6	0.1		0.5	
Delay (s)		12.4	5.4		14.2	
Level of Service		B	A		B	
Approach Delay (s)		12.4	5.4		14.2	
Approach LOS		B	A		B	

Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	337	115	83	14	19	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.98		0.87	
Flt Protected		0.96	1.00		1.00	
Satd. Flow (prot)		1761	1792		1589	
Flt Permitted		0.71	1.00		1.00	
Satd. Flow (perm)		1304	1792		1589	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	366	125	90	15	21	366
RTOR Reduction (vph)	0	0	7	0	294	0
Lane Group Flow (vph)	0	491	98	0	93	0
Turn Type	Perm					
Protected Phases		4	4		6	
Permitted Phases	4					
Actuated Green, G (s)		20.5	20.5		8.0	
Effective Green, g (s)		20.5	20.5		8.0	
Actuated g/C Ratio		0.51	0.51		0.20	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		660	907		314	
v/s Ratio Prot			0.05		c0.06	
v/s Ratio Perm		c0.38				
v/c Ratio		0.74	0.11		0.30	
Uniform Delay, d1		7.9	5.2		13.9	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		4.5	0.1		0.5	
Delay (s)		12.5	5.3		14.4	
Level of Service		B	A		B	
Approach Delay (s)		12.5	5.3		14.4	
Approach LOS		B	A		B	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	337	83	115	19	14	337
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	1.00	1.00	1.00	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)	1736	1827	1827	1553	1736	1553
Flt Permitted	0.68	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1236	1827	1827	1553	1736	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	366	90	125	21	15	366
RTOR Reduction (vph)	0	0	0	11	0	289
Lane Group Flow (vph)	366	90	125	10	15	77
Turn Type	Perm			Perm		Perm
Protected Phases		4	4		6	
Permitted Phases	4			4		6
Actuated Green, G (s)	16.3	16.3	16.3	16.3	7.5	7.5
Effective Green, g (s)	16.3	16.3	16.3	16.3	7.5	7.5
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.21	0.21
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)	563	832	832	707	364	325
v/s Ratio Prot		0.05	0.07		0.01	
v/s Ratio Perm	c0.30			0.01		c0.05
v/c Ratio	0.65	0.11	0.15	0.01	0.04	0.24
Uniform Delay, d1	7.5	5.6	5.7	5.3	11.3	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1	0.1	0.0	0.0	0.4
Delay (s)	10.2	5.6	5.8	5.4	11.3	12.1
Level of Service	B	A	A	A	B	B
Approach Delay (s)		9.3	5.7		12.1	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	35.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	337	115	83	14	19	337
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	1.00	1.00	1.00	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)	1736	1827	1827	1553	1736	1553
Flt Permitted	0.70	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1276	1827	1827	1553	1736	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	366	125	90	15	21	366
RTOR Reduction (vph)	0	0	0	8	0	289
Lane Group Flow (vph)	366	125	90	7	21	77
Turn Type	Perm			Perm		Perm
Protected Phases		4	4		6	
Permitted Phases	4			4		6
Actuated Green, G (s)	15.7	15.7	15.7	15.7	7.4	7.4
Effective Green, g (s)	15.7	15.7	15.7	15.7	7.4	7.4
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.21	0.21
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)	571	817	817	695	366	327
v/s Ratio Prot		0.07	0.05		0.01	
v/s Ratio Perm	c0.29			0.00		c0.05
v/c Ratio	0.64	0.15	0.11	0.01	0.06	0.24
Uniform Delay, d1	7.5	5.8	5.6	5.4	11.1	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.1	0.1	0.0	0.1	0.4
Delay (s)	10.0	5.8	5.7	5.4	11.1	11.9
Level of Service	A	A	A	A	B	B
Approach Delay (s)		8.9	5.7		11.8	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	35.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.7%	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												
Volume (veh/h)	23	476	14	223	657	364	19	211	223	263	152	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	517	15	242	714	396	21	229	242	286	165	25
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	1110			533			2079	2170	525	2329	1979	912
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1110			533			2079	2170	525	2329	1979	912
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 %	96			76			0	0	56	0	0	92
cM capacity (veh/h)	622			1025			0	34	549	0	45	329

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	558	1352	492	476
Volume Left	25	242	21	286
Volume Right	15	396	242	25
cSH	622	1025	0	0
Volume to Capacity	0.04	0.24	Err	Err
Queue Length 95th (ft)	3	23	Err	Err
Control Delay (s)	1.1	7.1	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	1.1	7.1	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	159.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	657	19	223	476	263	14	152	223	364	211	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	714	21	242	517	286	15	165	242	396	229	25
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	803			735			2059	2062	724	2245	1930	660
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	803			735			2059	2062	724	2245	1930	660
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 %	97			72			0	0	43	0	0	95
cM capacity (veh/h)	812			861			0	38	422	0	46	459

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	760	1046	423	650
Volume Left	25	242	15	396
Volume Right	21	286	242	25
cSH	812	861	0	0
Volume to Capacity	0.03	0.28	Err	Err
Queue Length 95th (ft)	2	29	Err	Err
Control Delay (s)	0.8	6.9	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.8	6.9	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	158.8%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	476	14	223	657	364	19	211	223	263	152	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.93			0.99	
Flt Protected		1.00			0.99			1.00			0.97	
Satd. Flow (prot)		1816			1739			1702			1761	
Flt Permitted		0.90			0.71			1.00			0.97	
Satd. Flow (perm)		1644			1243			1702			1761	
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)	25	517	15	242	714	396	21	229	242	286	165	25
RTOR Reduction (vph)	0	0	0	0	10	0	0	23	0	0	2	0
Lane Group Flow (vph)	0	557	0	0	1342	0	0	469	0	0	474	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		6			6		2	2		4	4	
Permitted Phases	6			6								
Actuated Green, G (s)		79.0			79.0			27.0			26.0	
Effective Green, g (s)		81.0			81.0			27.0			26.0	
Actuated g/C Ratio		0.54			0.54			0.18			0.17	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		888			671			306			305	
v/s Ratio Prot								c0.28			c0.27	
v/s Ratio Perm		0.34			c1.08							
v/c Ratio		0.63			2.00			1.53			1.56	
Uniform Delay, d1		24.0			34.5			61.5			62.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			455.2			255.6			265.4	
Delay (s)		25.4			489.7			317.1			327.4	
Level of Service		C			F			F			F	
Approach Delay (s)		25.4			489.7			317.1			327.4	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	343.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	162.7%	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)	23	657	19	223	476	263	14	152	223	364	211	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.92			0.99	
Flt Protected		1.00			0.99			1.00			0.97	
Satd. Flow (prot)		1817			1739			1682			1764	
Flt Permitted		0.95			0.55			1.00			0.97	
Satd. Flow (perm)		1723			975			1682			1764	
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)	25	714	21	242	517	286	15	165	242	396	229	25
RTOR Reduction (vph)	0	0	0	0	9	0	0	32	0	0	1	0
Lane Group Flow (vph)	0	760	0	0	1036	0	0	390	0	0	649	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		6			6		2	2		4	4	
Permitted Phases	6			6								
Actuated Green, G (s)		77.0			77.0			24.0			31.0	
Effective Green, g (s)		79.0			79.0			24.0			31.0	
Actuated g/C Ratio		0.53			0.53			0.16			0.21	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		907			514			269			365	
v/s Ratio Prot								c0.23			c0.37	
v/s Ratio Perm		0.44			c1.06							
v/c Ratio		0.84			2.02			1.45			1.78	
Uniform Delay, d1		30.1			35.5			63.0			59.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		6.8			463.9			222.2			361.3	
Delay (s)		36.9			499.4			285.2			420.8	
Level of Service		D			F			F			F	
Approach Delay (s)		36.9			499.4			285.2			420.8	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	328.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	162.2%	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)	23	476	14	223	657	364	19	211	223	263	152	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1816		1736	1827	1553		1819	1553	1736	1791	
Flt Permitted		0.84		0.40	1.00	1.00		0.96	1.00	0.60	1.00	
Satd. Flow (perm)		1527		723	1827	1553		1758	1553	1103	1791	
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)	25	517	15	242	714	396	21	229	242	286	165	25
RTOR Reduction (vph)	0	2	0	0	0	222	0	0	164	0	10	0
Lane Group Flow (vph)	0	555	0	242	714	174	0	250	78	286	180	0
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		
Protected Phases		4			7			2			5	
Permitted Phases	4			7		7	2		2	5		
Actuated Green, G (s)		22.3		22.3	22.3	22.3		16.4	16.4	16.4	16.4	
Effective Green, g (s)		24.3		24.3	24.3	22.3		16.4	16.4	16.4	16.4	
Actuated g/C Ratio		0.48		0.48	0.48	0.44		0.32	0.32	0.32	0.32	
Clearance Time (s)		6.0		6.0	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	3.0	3.0	
Lane Grp Cap (vph)		732		347	876	683		569	502	357	579	
v/s Ratio Prot					c0.39						0.10	
v/s Ratio Perm		0.36		0.33		0.11		0.14	0.05	c0.26		
v/c Ratio		0.76		0.70	0.82	0.26		0.44	0.16	0.80	0.31	
Uniform Delay, d1		10.8		10.3	11.3	9.0		13.5	12.2	15.7	12.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.5		6.0	5.9	0.2		0.5	0.1	12.2	0.3	
Delay (s)		15.3		16.3	17.2	9.2		14.1	12.4	27.8	13.2	
Level of Service		B		B	B	A		B	B	C	B	
Approach Delay (s)		15.3			14.7			13.2			22.0	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	50.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	105.1%	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)	23	657	19	223	476	263	14	152	223	364	211	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	6.0		6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1817		1736	1827	1553		1819	1553	1736	1800	
Flt Permitted		0.98		0.28	1.00	1.00		0.96	1.00	0.64	1.00	
Satd. Flow (perm)		1776		518	1827	1553		1762	1553	1176	1800	
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)	25	714	21	242	517	286	15	165	242	396	229	25
RTOR Reduction (vph)	0	2	0	0	0	153	0	0	107	0	6	0
Lane Group Flow (vph)	0	758	0	242	517	133	0	180	135	396	248	0
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		
Protected Phases		4			7			2			5	
Permitted Phases	4			7		7	2		2	5		
Actuated Green, G (s)		31.6		31.6	31.6	31.6		24.3	24.3	24.3	24.3	
Effective Green, g (s)		33.6		33.6	33.6	31.6		24.3	24.3	24.3	24.3	
Actuated g/C Ratio		0.49		0.49	0.49	0.47		0.36	0.36	0.36	0.36	
Clearance Time (s)		6.0		6.0	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	3.0	3.0	
Lane Grp Cap (vph)		879		256	904	723		631	556	421	644	
v/s Ratio Prot					0.28						0.14	
v/s Ratio Perm		0.43		c0.47		0.09		0.10	0.09	c0.34		
v/c Ratio		0.86		0.95	0.57	0.18		0.29	0.24	0.94	0.39	
Uniform Delay, d1		15.1		16.3	12.1	10.6		15.6	15.3	21.1	16.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		8.8		41.1	0.9	0.1		0.3	0.2	29.2	0.4	
Delay (s)		23.9		57.4	13.0	10.7		15.8	15.6	50.3	16.6	
Level of Service		C		E	B	B		B	B	D	B	
Approach Delay (s)		23.9			22.6			15.7			37.2	
Approach LOS		C			C			B			D	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	107.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	176	337	19	242	466	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	366	21	263	507	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			558		679	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			558		679	374
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	97
cM capacity (veh/h)			1003		406	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	558	284	527
Volume Left	0	21	507
Volume Right	366	0	21
cSH	1700	1003	412
Volume to Capacity	0.33	0.02	1.28
Queue Length 95th (ft)	0	2	575
Control Delay (s)	0.0	0.8	171.5
Lane LOS		A	F
Approach Delay (s)	0.0	0.8	171.5
Approach LOS			F

Intersection Summary			
Average Delay	66.2		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	242	466	19	176	337	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	263	507	21	191	366	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			770		749	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			770		749	516
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	96
cM capacity (veh/h)			836		367	555

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	770	212	387
Volume Left	0	21	366
Volume Right	507	0	21
cSH	1700	836	374
Volume to Capacity	0.45	0.02	1.03
Queue Length 95th (ft)	0	2	322
Control Delay (s)	0.0	1.2	89.7
Lane LOS		A	F
Approach Delay (s)	0.0	1.2	89.7
Approach LOS			F

Intersection Summary			
Average Delay	25.6		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	176	337	19	242	466	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.91			1.00	0.99	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1665			1820	1734	
Flt Permitted	1.00			0.81	0.95	
Satd. Flow (perm)	1665			1481	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	366	21	263	507	21
RTOR Reduction (vph)	166	0	0	0	3	0
Lane Group Flow (vph)	391	0	0	284	525	0
Turn Type			Perm			
Protected Phases	6			2	4	
Permitted Phases			2			
Actuated Green, G (s)	12.5			12.5	14.4	
Effective Green, g (s)	14.5			14.5	16.4	
Actuated g/C Ratio	0.37			0.37	0.42	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	621			552	731	
v/s Ratio Prot	c0.23				c0.30	
v/s Ratio Perm				0.19		
v/c Ratio	0.63			0.51	0.72	
Uniform Delay, d1	10.0			9.5	9.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.0			0.8	3.4	
Delay (s)	12.0			10.3	12.7	
Level of Service	B			B	B	
Approach Delay (s)	12.0			10.3	12.7	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	242	466	19	176	337	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.91			1.00	0.99	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1665			1818	1732	
Flt Permitted	1.00			0.80	0.95	
Satd. Flow (perm)	1665			1464	1732	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	507	21	191	366	21
RTOR Reduction (vph)	134	0	0	0	4	0
Lane Group Flow (vph)	636	0	0	212	383	0
Turn Type			Perm			
Protected Phases	6			2	4	
Permitted Phases			2			
Actuated Green, G (s)	21.6			21.6	13.8	
Effective Green, g (s)	23.6			23.6	15.8	
Actuated g/C Ratio	0.50			0.50	0.33	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	829			729	577	
v/s Ratio Prot	c0.38				c0.22	
v/s Ratio Perm				0.14		
v/c Ratio	0.77			0.29	0.66	
Uniform Delay, d1	9.7			7.0	13.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	4.3			0.2	2.9	
Delay (s)	14.0			7.2	16.4	
Level of Service	B			A	B	
Approach Delay (s)	14.0			7.2	16.4	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	176	337	19	242	466	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	1827	1553		1820	1734	
Flt Permitted	1.00	1.00		0.97	0.95	
Satd. Flow (perm)	1827	1553		1766	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	366	21	263	507	21
RTOR Reduction (vph)	0	239	0	0	3	0
Lane Group Flow (vph)	191	127	0	284	525	0
Turn Type		Perm	Perm			
Protected Phases	6			2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	11.2	11.2		11.2	14.7	
Effective Green, g (s)	13.2	13.2		13.2	16.7	
Actuated g/C Ratio	0.35	0.35		0.35	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	636	541		615	764	
v/s Ratio Prot	0.10				c0.30	
v/s Ratio Perm		0.08		c0.16		
v/c Ratio	0.30	0.24		0.46	0.69	
Uniform Delay, d1	9.0	8.8		9.6	8.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.6	2.6	
Delay (s)	9.3	9.0		10.1	11.1	
Level of Service	A	A		B	B	
Approach Delay (s)	9.1			10.1	11.1	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	37.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	242	466	19	176	337	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	1827	1553		1818	1732	
Flt Permitted	1.00	1.00		0.95	0.95	
Satd. Flow (perm)	1827	1553		1737	1732	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	507	21	191	366	21
RTOR Reduction (vph)	0	309	0	0	5	0
Lane Group Flow (vph)	263	198	0	212	382	0
Turn Type		Perm	Perm			
Protected Phases	6			2	4	
Permitted Phases		6	2			
Actuated Green, G (s)	12.3	12.3		12.3	12.4	
Effective Green, g (s)	14.3	14.3		14.3	14.4	
Actuated g/C Ratio	0.39	0.39		0.39	0.39	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	712	605		677	680	
v/s Ratio Prot	c0.14				c0.22	
v/s Ratio Perm		0.13		0.12		
v/c Ratio	0.37	0.33		0.31	0.56	
Uniform Delay, d1	8.0	7.8		7.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3		0.3	1.1	
Delay (s)	8.3	8.1		8.1	9.8	
Level of Service	A	A		A	A	
Approach Delay (s)	8.2			8.1	9.8	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	36.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	23	485	670	574	416	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	527	728	624	452	25
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	1352				1617	1040
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1352				1617	1040
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				0	91
cM capacity (veh/h)	503				107	277

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	552	1352	477
Volume Left	25	0	452
Volume Right	0	624	25
cSH	503	1700	111
Volume to Capacity	0.05	0.80	4.32
Queue Length 95th (ft)	4	0	Err
Control Delay (s)	1.4	0.0	Err
Lane LOS	A		F
Approach Delay (s)	1.4	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay	2003.8		
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	23	670	485	416	574	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	728	527	452	624	25
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	979				1532	753
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	979				1532	753
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				0	94
cM capacity (veh/h)	697				123	406

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	753	979	649
Volume Left	25	0	624
Volume Right	0	452	25
cSH	697	1700	126
Volume to Capacity	0.04	0.58	5.15
Queue Length 95th (ft)	3	0	Err
Control Delay (s)	1.0	0.0	Err
Lane LOS	A		F
Approach Delay (s)	1.0	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay	2724.8		
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	23	485	670	574	416	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.94		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1823	1713		1732	
Flt Permitted		0.89	1.00		0.95	
Satd. Flow (perm)		1635	1713		1732	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	527	728	624	452	25
RTOR Reduction (vph)	0	0	24	0	1	0
Lane Group Flow (vph)	0	552	1328	0	476	0
Turn Type	Perm					
Protected Phases		4	2!		6!	
Permitted Phases	4					
Actuated Green, G (s)		39.0	83.0		83.0	
Effective Green, g (s)		39.0	83.0		83.0	
Actuated g/C Ratio		0.30	0.64		0.64	
Clearance Time (s)		4.0	4.0		4.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		491	1094		1106	
v/s Ratio Prot			c0.78		0.27	
v/s Ratio Perm		c0.34				
v/c Ratio		1.12	1.21		0.43	
Uniform Delay, d1		45.5	23.5		11.7	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		79.3	104.9		0.3	
Delay (s)		124.8	128.4		12.0	
Level of Service		F	F		B	
Approach Delay (s)		124.8	128.4		12.0	
Approach LOS		F	F		B	

Intersection Summary			
HCM Average Control Delay	104.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	23	670	485	416	574	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.94		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1824	1713		1734	
Flt Permitted		0.95	1.00		0.95	
Satd. Flow (perm)		1741	1713		1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	728	527	452	624	25
RTOR Reduction (vph)	0	0	35	0	2	0
Lane Group Flow (vph)	0	753	945	0	648	0
Turn Type	Perm					
Protected Phases		4	2!		6!	
Permitted Phases	4					
Actuated Green, G (s)		37.0	45.0		45.0	
Effective Green, g (s)		37.0	45.0		45.0	
Actuated g/C Ratio		0.41	0.50		0.50	
Clearance Time (s)		4.0	4.0		4.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		716	857		867	
v/s Ratio Prot			c0.55		0.37	
v/s Ratio Perm		c0.43				
v/c Ratio		1.05	1.10		0.75	
Uniform Delay, d1		26.5	22.5		18.0	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		48.0	62.6		3.5	
Delay (s)		74.5	85.1		21.5	
Level of Service		E	F		C	
Approach Delay (s)		74.5	85.1		21.5	
Approach LOS		E	F		C	

Intersection Summary			
HCM Average Control Delay	64.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	23	485	670	574	416	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	0.97	
Frt		1.00	1.00	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		1823	1827	1553	3357	
Flt Permitted		0.96	1.00	1.00	0.95	
Satd. Flow (perm)		1748	1827	1553	3357	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	527	728	624	452	25
RTOR Reduction (vph)	0	0	0	265	9	0
Lane Group Flow (vph)	0	552	728	359	468	0
Turn Type	Perm			Perm		
Protected Phases		6	2		4	
Permitted Phases	6			2		
Actuated Green, G (s)		21.2	21.2	21.2	7.1	
Effective Green, g (s)		23.2	23.2	23.2	9.1	
Actuated g/C Ratio		0.58	0.58	0.58	0.23	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1006	1052	894	758	
v/s Ratio Prot			c0.40		c0.14	
v/s Ratio Perm		0.32		0.23		
v/c Ratio		0.55	0.69	0.40	0.62	
Uniform Delay, d1		5.3	6.0	4.7	14.0	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6	2.0	0.3	1.5	
Delay (s)		5.9	8.0	5.0	15.5	
Level of Service		A	A	A	B	
Approach Delay (s)		5.9	6.6		15.5	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	40.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	23	670	485	416	574	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	0.97	
Frt		1.00	1.00	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		1824	1827	1553	3362	
Flt Permitted		0.98	1.00	1.00	0.95	
Satd. Flow (perm)		1783	1827	1553	3362	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	728	527	452	624	25
RTOR Reduction (vph)	0	0	0	204	5	0
Lane Group Flow (vph)	0	753	527	248	644	0
Turn Type	Perm			Perm		
Protected Phases		6	2		4	
Permitted Phases	6			2		
Actuated Green, G (s)		24.3	24.3	24.3	11.6	
Effective Green, g (s)		26.3	26.3	26.3	13.6	
Actuated g/C Ratio		0.55	0.55	0.55	0.28	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		979	1003	853	955	
v/s Ratio Prot			0.29		c0.19	
v/s Ratio Perm		c0.42		0.16		
v/c Ratio		0.77	0.53	0.29	0.67	
Uniform Delay, d1		8.4	6.8	5.8	15.2	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.7	0.5	0.2	1.9	
Delay (s)		12.1	7.3	6.0	17.1	
Level of Service		B	A	A	B	
Approach Delay (s)		12.1	6.7		17.1	
Approach LOS		B	A		B	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	65	360	498	108	79	65
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	391	541	117	86	71
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	1321	121	157			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1321	121	157			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	33	58	62			
cM capacity (veh/h)	105	925	1411			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	462	659	157
Volume Left	71	541	0
Volume Right	391	0	71
cSH	423	1411	1700
Volume to Capacity	1.09	0.38	0.09
Queue Length 95th (ft)	396	46	0
Control Delay (s)	102.6	8.2	0.0
Lane LOS	F	A	
Approach Delay (s)	102.6	8.2	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	41.3		
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	65	498	360	79	108	65
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	541	391	86	117	71
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	1021	153	188			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1021	153	188			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	39	72			
cM capacity (veh/h)	186	888	1374			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	612	477	188
Volume Left	71	391	0
Volume Right	541	0	71
cSH	618	1374	1700
Volume to Capacity	0.99	0.28	0.11
Queue Length 95th (ft)	369	30	0
Control Delay (s)	59.6	7.6	0.0
Lane LOS	F	A	
Approach Delay (s)	59.6	7.6	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	31.4		
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	360	498	108	79	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.89			1.00	0.94	
Flt Protected	0.99			0.96	1.00	
Satd. Flow (prot)	1606			1755	1715	
Flt Permitted	0.99			0.66	1.00	
Satd. Flow (perm)	1606			1207	1715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	391	541	117	86	71
RTOR Reduction (vph)	293	0	0	0	39	0
Lane Group Flow (vph)	169	0	0	658	118	0
Turn Type			pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6		5			
Actuated Green, G (s)	10.2			26.9	21.3	
Effective Green, g (s)	10.2			26.9	21.3	
Actuated g/C Ratio	0.19			0.49	0.39	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	297			645	663	
v/s Ratio Prot				c0.10	0.07	
v/s Ratio Perm	c0.11			c0.39		
v/c Ratio	0.57			1.02	0.18	
Uniform Delay, d1	20.4			14.1	11.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.5			40.6	0.1	
Delay (s)	22.9			54.7	11.3	
Level of Service	C			D	B	
Approach Delay (s)	22.9			54.7	11.3	
Approach LOS	C			D	B	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	498	360	79	108	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.88			1.00	0.95	
Flt Protected	0.99			0.96	1.00	
Satd. Flow (prot)	1600			1755	1734	
Flt Permitted	0.99			0.64	1.00	
Satd. Flow (perm)	1600			1175	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	541	391	86	117	71
RTOR Reduction (vph)	424	0	0	0	35	0
Lane Group Flow (vph)	188	0	0	477	153	0
Turn Type			pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6		5			
Actuated Green, G (s)	9.7			17.1	11.5	
Effective Green, g (s)	9.7			17.1	11.5	
Actuated g/C Ratio	0.22			0.38	0.26	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	346			521	445	
v/s Ratio Prot				c0.11	0.09	
v/s Ratio Perm	c0.12			c0.24		
v/c Ratio	0.54			0.92	0.34	
Uniform Delay, d1	15.6			13.2	13.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.7			20.7	0.5	
Delay (s)	17.3			33.9	14.0	
Level of Service	B			C	B	
Approach Delay (s)	17.3			33.9	14.0	
Approach LOS	B			C	B	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	44.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	360	498	108	79	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1736	1553	1736	1827	1715	
Flt Permitted	0.95	1.00	0.66	1.00	1.00	
Satd. Flow (perm)	1736	1553	1201	1827	1715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	391	541	117	86	71
RTOR Reduction (vph)	0	323	0	0	53	0
Lane Group Flow (vph)	71	68	541	117	104	0
Turn Type		custom	pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6	6	5			
Actuated Green, G (s)	8.1	8.1	20.6	8.4	8.4	
Effective Green, g (s)	8.1	8.1	24.6	8.4	8.4	
Actuated g/C Ratio	0.17	0.17	0.53	0.18	0.18	
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)	301	269	795	329	308	
v/s Ratio Prot			c0.21	0.06	0.06	
v/s Ratio Perm	0.04	c0.04	c0.15			
v/c Ratio	0.24	0.25	0.68	0.36	0.34	
Uniform Delay, d1	16.6	16.7	7.6	16.8	16.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.5	2.4	0.7	0.7	
Delay (s)	17.0	17.2	10.0	17.4	17.4	
Level of Service	B	B	B	B	B	
Approach Delay (s)	17.2			11.3	17.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	46.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	498	360	79	108	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1736	1553	1736	1827	1734	
Flt Permitted	0.95	1.00	0.64	1.00	1.00	
Satd. Flow (perm)	1736	1553	1168	1827	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	541	391	86	117	71
RTOR Reduction (vph)	0	442	0	0	38	0
Lane Group Flow (vph)	71	99	391	86	150	0
Turn Type		custom	pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6	6	5			
Actuated Green, G (s)	8.5	8.5	19.9	9.2	9.2	
Effective Green, g (s)	8.5	8.5	23.9	9.2	9.2	
Actuated g/C Ratio	0.18	0.18	0.52	0.20	0.20	
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)	318	284	757	362	344	
v/s Ratio Prot			c0.14	0.05	0.09	
v/s Ratio Perm	0.04	c0.06	c0.12			
v/c Ratio	0.22	0.35	0.52	0.24	0.44	
Uniform Delay, d1	16.1	16.5	7.0	15.6	16.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.7	0.6	0.3	0.9	
Delay (s)	16.5	17.3	7.6	16.0	17.2	
Level of Service	B	B	A	B	B	
Approach Delay (s)	17.2			9.1	17.2	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	50.5%	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												
Volume (veh/h)	60	286	74	83	396	102	102	230	83	74	166	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	311	80	90	430	111	111	250	90	80	180	65
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	541			391			1303	1203	351	1363	1188	486
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	541			391			1303	1203	351	1363	1188	486
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 %	94			92			0	0	87	0	0	89
cM capacity (veh/h)	1027			1167			0	159	692	0	163	581

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	457	632	451	326
Volume Left	65	90	111	80
Volume Right	80	111	90	65
cSH	1027	1167	0	0
Volume to Capacity	0.06	0.08	Err	Err
Queue Length 95th (ft)	5	6	Err	Err
Control Delay (s)	1.9	2.0	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	1.9	2.0	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	396	102	83	286	74	74	166	83	102	230	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	430	111	90	311	80	80	180	90	111	250	65
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	391			541			1338	1188	486	1328	1203	351
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391			541			1338	1188	486	1328	1203	351
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 %	94			91			0	0	84	0	0	91
cM capacity (veh/h)	1167			1027			0	162	581	0	159	692

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	607	482	351	426
Volume Left	65	90	80	111
Volume Right	111	80	90	65
cSH	1167	1027	0	0
Volume to Capacity	0.06	0.09	Err	Err
Queue Length 95th (ft)	4	7	Err	Err
Control Delay (s)	1.5	2.5	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	1.5	2.5	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	286	74	83	396	102	102	230	83	74	166	60
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.97			0.97	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1806			1806			1791			1790	
Flt Permitted		0.85			0.88			0.81			0.78	
Satd. Flow (perm)		1550			1594			1472			1409	
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)	65	311	80	90	430	111	111	250	90	80	180	65
RTOR Reduction (vph)	0	13	0	0	13	0	0	16	0	0	16	0
Lane Group Flow (vph)	0	443	0	0	618	0	0	435	0	0	309	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.2			24.2			19.5			19.5	
Effective Green, g (s)		24.2			24.2			19.5			19.5	
Actuated g/C Ratio		0.43			0.43			0.35			0.35	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		673			693			515			493	
v/s Ratio Prot												
v/s Ratio Perm		0.29			c0.39			c0.30			0.22	
v/c Ratio		0.66			0.89			0.85			0.63	
Uniform Delay, d1		12.5			14.5			16.7			15.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.3			13.8			12.1			2.5	
Delay (s)		14.8			28.3			28.8			17.6	
Level of Service		B			C			C			B	
Approach Delay (s)		14.8			28.3			28.8			17.6	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.7%	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)	60	396	102	83	286	74	74	166	83	102	230	60
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.97			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1807			1804			1778			1801	
Flt Permitted		0.91			0.78			0.80			0.80	
Satd. Flow (perm)		1656			1428			1446			1454	
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)	65	430	111	90	311	80	80	180	90	111	250	65
RTOR Reduction (vph)	0	15	0	0	13	0	0	23	0	0	12	0
Lane Group Flow (vph)	0	591	0	0	468	0	0	327	0	0	414	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.1			21.1			17.4			17.4	
Effective Green, g (s)		21.1			21.1			17.4			17.4	
Actuated g/C Ratio		0.42			0.42			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		692			597			498			501	
v/s Ratio Prot												
v/s Ratio Perm		c0.36			0.33			0.23			c0.28	
v/c Ratio		0.85			0.78			0.66			0.83	
Uniform Delay, d1		13.3			12.7			14.0			15.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		10.0			6.7			3.1			10.7	
Delay (s)		23.3			19.4			17.1			25.9	
Level of Service		C			B			B			C	
Approach Delay (s)		23.3			19.4			17.1			25.9	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.2%	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)	60	286	74	83	396	102	102	230	83	74	166	60
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		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1806		1770	1805		1770	1789		1770	1789	
Flt Permitted	0.34	1.00		0.51	1.00		0.61	1.00		0.53	1.00	
Satd. Flow (perm)	630	1806		947	1805		1130	1789		988	1789	
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)	65	311	80	90	430	111	111	250	90	80	180	65
RTOR Reduction (vph)	0	19	0	0	19	0	0	27	0	0	27	0
Lane Group Flow (vph)	65	372	0	90	522	0	111	313	0	80	218	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.2	16.2		16.2	16.2		12.1	12.1		12.1	12.1	
Effective Green, g (s)	16.2	16.2		16.2	16.2		12.1	12.1		12.1	12.1	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.30	0.30		0.30	0.30	
Clearance Time (s)	6.0	6.0		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		3.0	3.0	
Lane Grp Cap (vph)	253	726		381	726		339	537		297	537	
v/s Ratio Prot		0.21			c0.29			c0.17			0.12	
v/s Ratio Perm	0.10			0.10			0.10			0.08		
v/c Ratio	0.26	0.51		0.24	0.72		0.33	0.58		0.27	0.41	
Uniform Delay, d1	8.0	9.1		8.0	10.1		10.9	12.0		10.7	11.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6		0.3	3.4		0.6	1.6		0.5	0.5	
Delay (s)	8.6	9.7		8.3	13.6		11.5	13.6		11.2	11.7	
Level of Service	A	A		A	B		B	B		B	B	
Approach Delay (s)		9.5			12.8			13.1			11.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	40.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.6%	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)	60	396	102	83	286	74	74	166	83	102	230	60
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		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1805		1770	1806		1770	1770		1770	1805	
Flt Permitted	0.51	1.00		0.35	1.00		0.57	1.00		0.59	1.00	
Satd. Flow (perm)	956	1805		644	1806		1058	1770		1105	1805	
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)	65	430	111	90	311	80	80	180	90	111	250	65
RTOR Reduction (vph)	0	19	0	0	19	0	0	38	0	0	20	0
Lane Group Flow (vph)	65	522	0	90	372	0	80	232	0	111	295	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.4	16.4		16.4	16.4		11.6	11.6		11.6	11.6	
Effective Green, g (s)	16.4	16.4		16.4	16.4		11.6	11.6		11.6	11.6	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.29	0.29		0.29	0.29	
Clearance Time (s)	6.0	6.0		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		3.0	3.0	
Lane Grp Cap (vph)	392	740		264	740		307	513		320	523	
v/s Ratio Prot		c0.29			0.21			0.13			c0.16	
v/s Ratio Perm	0.07			0.14			0.08			0.10		
v/c Ratio	0.17	0.70		0.34	0.50		0.26	0.45		0.35	0.56	
Uniform Delay, d1	7.5	9.8		8.1	8.8		10.9	11.6		11.2	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	3.1		0.8	0.5		0.5	0.6		0.7	1.4	
Delay (s)	7.7	12.9		8.9	9.3		11.4	12.2		11.9	13.5	
Level of Service	A	B		A	A		B	B		B	B	
Approach Delay (s)		12.3			9.2			12.0			13.0	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	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 (veh/h)	106	282	37	57	389	160	51	313	57	116	226	106
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	115	307	40	62	423	174	55	340	62	126	246	115
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	597			347			1429	1278	327	1423	1211	510
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	597			347			1429	1278	327	1423	1211	510
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 %	88			95			0	0	91	0	0	80
cM capacity (veh/h)	980			1212			0	139	715	0	153	564

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	462	659	458	487
Volume Left	115	62	55	126
Volume Right	40	174	62	115
cSH	980	1212	0	0
Volume to Capacity	0.12	0.05	Err	Err
Queue Length 95th (ft)	10	4	Err	Err
Control Delay (s)	3.3	1.3	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	3.3	1.3	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	106	389	51	57	282	116	37	226	57	160	313	106
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	115	423	55	62	307	126	40	246	62	174	340	115
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	433			478			1460	1238	451	1359	1202	370
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433			478			1460	1238	451	1359	1202	370
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 %	90			94			0	0	90	0	0	83
cM capacity (veh/h)	1127			1084			0	149	609	0	156	676

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	593	495	348	629
Volume Left	115	62	40	174
Volume Right	55	126	62	115
cSH	1127	1084	0	0
Volume to Capacity	0.10	0.06	Err	Err
Queue Length 95th (ft)	9	5	Err	Err
Control Delay (s)	2.6	1.6	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	2.6	1.6	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	282	37	57	389	160	51	313	57	116	226	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.98			0.97	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1818			1788			1818			1780	
Flt Permitted		0.73			0.93			0.92			0.77	
Satd. Flow (perm)		1335			1676			1681			1392	
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)	115	307	40	62	423	174	55	340	62	126	246	115
RTOR Reduction (vph)	0	7	0	0	26	0	0	12	0	0	22	0
Lane Group Flow (vph)	0	455	0	0	633	0	0	445	0	0	465	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.2			20.2			18.3			18.3	
Effective Green, g (s)		20.2			20.2			18.3			18.3	
Actuated g/C Ratio		0.43			0.43			0.39			0.39	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		580			728			662			548	
v/s Ratio Prot												
v/s Ratio Perm		0.34			c0.38			0.26			c0.33	
v/c Ratio		0.78			0.87			0.67			0.85	
Uniform Delay, d1		11.3			12.0			11.6			12.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		6.9			10.8			2.7			11.6	
Delay (s)		18.2			22.7			14.3			24.5	
Level of Service		B			C			B			C	
Approach Delay (s)		18.2			22.7			14.3			24.5	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.0%	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)	106	389	51	57	282	116	37	226	57	160	313	106
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1822			1788			1808			1792	
Flt Permitted		0.76			0.86			0.90			0.76	
Satd. Flow (perm)		1397			1545			1629			1387	
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)	115	423	55	62	307	126	40	246	62	174	340	115
RTOR Reduction (vph)	0	5	0	0	16	0	0	10	0	0	11	0
Lane Group Flow (vph)	0	588	0	0	479	0	0	338	0	0	618	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		31.0			31.0			32.0			32.0	
Effective Green, g (s)		31.0			31.0			32.0			32.0	
Actuated g/C Ratio		0.41			0.41			0.43			0.43	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		577			639			695			592	
v/s Ratio Prot												
v/s Ratio Perm		c0.42			0.31			0.21			c0.45	
v/c Ratio		1.02			0.75			0.49			1.04	
Uniform Delay, d1		22.0			18.7			15.6			21.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		42.5			4.8			0.5			49.0	
Delay (s)		64.5			23.5			16.1			70.5	
Level of Service		E			C			B			E	
Approach Delay (s)		64.5			23.5			16.1			70.5	
Approach LOS		E			C			B			E	

Intersection Summary			
HCM Average Control Delay	48.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.2%	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)	106	282	37	57	389	160	51	313	57	116	226	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1831		1770	1781		1770	1820		1770	1774	
Flt Permitted	0.27	1.00		0.52	1.00		0.45	1.00		0.40	1.00	
Satd. Flow (perm)	497	1831		962	1781		846	1820		748	1774	
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)	115	307	40	62	423	174	55	340	62	126	246	115
RTOR Reduction (vph)	0	9	0	0	31	0	0	14	0	0	35	0
Lane Group Flow (vph)	115	338	0	62	566	0	55	388	0	126	326	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.9	16.9		16.9	16.9		13.4	13.4		13.4	13.4	
Effective Green, g (s)	16.9	16.9		16.9	16.9		13.4	13.4		13.4	13.4	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.35	0.35		0.35	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	808		424	786		296	637		262	621	
v/s Ratio Prot		0.18			c0.32			c0.21			0.18	
v/s Ratio Perm	0.23			0.06			0.07			0.17		
v/c Ratio	0.53	0.42		0.15	0.72		0.19	0.61		0.48	0.52	
Uniform Delay, d1	7.8	7.3		6.4	8.8		8.7	10.3		9.7	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.4		0.2	3.3		0.3	1.7		1.4	0.8	
Delay (s)	10.0	7.7		6.6	12.0		9.0	12.0		11.1	10.7	
Level of Service	B	A		A	B		A	B		B	B	
Approach Delay (s)		8.3			11.5			11.6			10.8	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	38.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.8%	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)	106	389	51	57	282	116	37	226	57	160	313	106
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		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1831		1770	1781		1770	1806		1770	1792	
Flt Permitted	0.43	1.00		0.37	1.00		0.40	1.00		0.57	1.00	
Satd. Flow (perm)	806	1831		697	1781		745	1806		1067	1792	
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)	115	423	55	62	307	126	40	246	62	174	340	115
RTOR Reduction (vph)	0	10	0	0	33	0	0	21	0	0	28	0
Lane Group Flow (vph)	115	468	0	62	400	0	40	287	0	174	427	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.8	13.8		13.8	13.8		13.6	13.6		13.6	13.6	
Effective Green, g (s)	13.8	13.8		13.8	13.8		13.6	13.6		13.6	13.6	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.35	0.35		0.35	0.35	
Clearance Time (s)	6.0	6.0		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		3.0	3.0	
Lane Grp Cap (vph)	282	641		244	624		257	623		368	619	
v/s Ratio Prot		c0.26			0.22			0.16			c0.24	
v/s Ratio Perm	0.14			0.09			0.05			0.16		
v/c Ratio	0.41	0.73		0.25	0.64		0.16	0.46		0.47	0.69	
Uniform Delay, d1	9.7	11.2		9.1	10.7		8.9	10.0		10.1	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	4.2		0.6	2.3		0.3	0.5		1.0	3.2	
Delay (s)	10.7	15.3		9.7	13.0		9.2	10.6		11.1	14.3	
Level of Service	B	B		A	B		A	B		B	B	
Approach Delay (s)		14.4			12.6			10.4			13.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	39.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	286	396	230	166	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	311	430	250	180	5
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	1294	183	186			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1294	183	186			
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	64	69			
cM capacity (veh/h)	124	859	1389			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	316	680	186
Volume Left	5	430	0
Volume Right	311	0	5
cSH	780	1389	1700
Volume to Capacity	0.41	0.31	0.11
Queue Length 95th (ft)	50	33	0
Control Delay (s)	12.7	6.7	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	6.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	396	286	166	230	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	430	311	180	250	5
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	1055	253	255			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1055	253	255			
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	45	76			
cM capacity (veh/h)	191	786	1310			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	436	491	255
Volume Left	5	311	0
Volume Right	430	0	5
cSH	756	1310	1700
Volume to Capacity	0.58	0.24	0.15
Queue Length 95th (ft)	93	23	0
Control Delay (s)	16.0	6.3	0.0
Lane LOS	C	A	
Approach Delay (s)	16.0	6.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	286	396	230	166	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.87			1.00	1.00	
Flt Protected	1.00			0.97	1.00	
Satd. Flow (prot)	1614			1806	1856	
Flt Permitted	1.00			0.70	1.00	
Satd. Flow (perm)	1614			1307	1856	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	311	430	250	180	5
RTOR Reduction (vph)	267	0	0	0	1	0
Lane Group Flow (vph)	49	0	0	680	184	0
Turn Type			Perm			
Protected Phases				2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	7.5			33.0	33.0	
Effective Green, g (s)	7.5			33.0	33.0	
Actuated g/C Ratio	0.14			0.63	0.63	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	231			822	1167	
v/s Ratio Prot					0.10	
v/s Ratio Perm	c0.03			c0.52		
v/c Ratio	0.21			0.83	0.16	
Uniform Delay, d1	19.9			7.5	4.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.5			6.9	0.1	
Delay (s)	20.4			14.4	4.1	
Level of Service	C			B	A	
Approach Delay (s)	20.4			14.4	4.1	
Approach LOS	C			B	A	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	396	286	166	230	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.87			1.00	1.00	
Flt Protected	1.00			0.97	1.00	
Satd. Flow (prot)	1613			1806	1858	
Flt Permitted	1.00			0.66	1.00	
Satd. Flow (perm)	1613			1238	1858	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	430	311	180	250	5
RTOR Reduction (vph)	346	0	0	0	1	0
Lane Group Flow (vph)	89	0	0	491	254	0
Turn Type			Perm			
Protected Phases				2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	8.0			21.0	21.0	
Effective Green, g (s)	8.0			21.0	21.0	
Actuated g/C Ratio	0.20			0.51	0.51	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	315			634	952	
v/s Ratio Prot					0.14	
v/s Ratio Perm	c0.06			c0.40		
v/c Ratio	0.28			0.77	0.27	
Uniform Delay, d1	14.1			8.1	5.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.5			5.9	0.2	
Delay (s)	14.5			14.0	5.8	
Level of Service	B			B	A	
Approach Delay (s)	14.5			14.0	5.8	
Approach LOS	B			B	A	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	41.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	286	396	230	166	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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)	1736	1553	1736	1827	1827	1553
Flt Permitted	0.95	1.00	0.45	1.00	1.00	1.00
Satd. Flow (perm)	1736	1553	828	1827	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	311	430	250	180	5
RTOR Reduction (vph)	0	246	0	0	0	4
Lane Group Flow (vph)	5	65	430	250	180	1
Turn Type		Perm	pm+pt			Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	7	2			6
Actuated Green, G (s)	6.1	6.1	20.5	20.5	7.5	7.5
Effective Green, g (s)	8.1	8.1	22.5	22.5	9.5	9.5
Actuated g/C Ratio	0.21	0.21	0.58	0.58	0.25	0.25
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)	364	326	694	1065	450	382
v/s Ratio Prot	0.00		c0.14	0.14	0.10	
v/s Ratio Perm		c0.04	c0.22			0.00
v/c Ratio	0.01	0.20	0.62	0.23	0.40	0.00
Uniform Delay, d1	12.1	12.6	4.8	3.9	12.2	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.3	1.7	0.1	0.6	0.0
Delay (s)	12.1	12.9	6.4	4.0	12.8	11.0
Level of Service	B	B	A	A	B	B
Approach Delay (s)	12.9			5.5	12.7	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	38.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	396	286	166	230	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
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)	1736	1553	1736	1827	1827	1553
Flt Permitted	0.95	1.00	0.42	1.00	1.00	1.00
Satd. Flow (perm)	1736	1553	764	1827	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	430	311	180	250	5
RTOR Reduction (vph)	0	334	0	0	0	4
Lane Group Flow (vph)	5	96	311	180	250	1
Turn Type		Perm	pm+pt			Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	7	2			6
Actuated Green, G (s)	6.5	6.5	19.4	19.4	8.4	8.4
Effective Green, g (s)	8.5	8.5	21.4	21.4	10.4	10.4
Actuated g/C Ratio	0.22	0.22	0.56	0.56	0.27	0.27
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)	389	348	611	1032	501	426
v/s Ratio Prot	0.00		c0.09	0.10	0.14	
v/s Ratio Perm		c0.06	c0.19			0.00
v/c Ratio	0.01	0.28	0.51	0.17	0.50	0.00
Uniform Delay, d1	11.4	12.2	4.7	4.0	11.6	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.4	0.7	0.1	0.8	0.0
Delay (s)	11.4	12.6	5.4	4.1	12.3	10.0
Level of Service	B	B	A	A	B	A
Approach Delay (s)	12.6			4.9	12.3	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	37.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.3%	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)	23	116	148	26	160	13	204	191	26	9	139	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	126	161	28	174	14	222	208	28	10	151	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	312	216	458	186
Volume Left (vph)	25	28	222	10
Volume Right (vph)	161	14	28	25
Hadj (s)	-0.26	0.02	0.09	-0.04
Departure Headway (s)	6.3	6.8	6.2	6.7
Degree Utilization, x	0.54	0.41	0.78	0.34
Capacity (veh/h)	516	463	562	464
Control Delay (s)	16.5	14.3	28.0	13.2
Approach Delay (s)	16.5	14.3	28.0	13.2
Approach LOS	C	B	D	B

Intersection Summary			
Delay	20.1		
HCM Level of Service	C		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
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)	23	160	204	26	116	9	148	139	26	13	191	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	174	222	28	126	10	161	151	28	14	208	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	421	164	340	247
Volume Left (vph)	25	28	161	14
Volume Right (vph)	222	10	28	25
Hadj (s)	-0.27	0.03	0.08	-0.02
Departure Headway (s)	6.0	6.9	6.4	6.6
Degree Utilization, x	0.70	0.31	0.61	0.45
Capacity (veh/h)	564	441	521	484
Control Delay (s)	21.5	13.0	18.9	14.9
Approach Delay (s)	21.5	13.0	18.9	14.9
Approach LOS	C	B	C	B

Intersection Summary			
Delay	18.2		
HCM Level of Service	C		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	116	148	26	160	13	204	191	26	9	139	23
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.99			0.99			0.98	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		1726			1835			1804			1824	
Flt Permitted		0.95			0.92			0.75			0.97	
Satd. Flow (perm)		1648			1705			1393			1769	
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)	25	126	161	28	174	14	222	208	28	10	151	25
RTOR Reduction (vph)	0	79	0	0	5	0	0	5	0	0	12	0
Lane Group Flow (vph)	0	233	0	0	211	0	0	453	0	0	174	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.4			10.4			17.4			17.4	
Effective Green, g (s)		10.4			10.4			17.4			17.4	
Actuated g/C Ratio		0.26			0.26			0.44			0.44	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		431			446			609			773	
v/s Ratio Prot												
v/s Ratio Perm		c0.14			0.12			c0.33			0.10	
v/c Ratio		0.54			0.47			0.74			0.22	
Uniform Delay, d1		12.6			12.4			9.3			7.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			0.8			4.9			0.1	
Delay (s)		14.0			13.2			14.2			7.1	
Level of Service		B			B			B			A	
Approach Delay (s)		14.0			13.2			14.2			7.1	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	39.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	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)	23	160	204	26	116	9	148	139	26	13	191	23
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.99			0.99			0.99	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		1725			1832			1799			1832	
Flt Permitted		0.97			0.89			0.75			0.96	
Satd. Flow (perm)		1679			1651			1387			1772	
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)	25	174	222	28	126	10	161	151	28	14	208	25
RTOR Reduction (vph)	0	93	0	0	5	0	0	8	0	0	9	0
Lane Group Flow (vph)	0	328	0	0	159	0	0	332	0	0	238	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		11.9			11.9			13.0			13.0	
Effective Green, g (s)		11.9			11.9			13.0			13.0	
Actuated g/C Ratio		0.32			0.32			0.35			0.35	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		541			532			489			624	
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.10			c0.24			0.13	
v/c Ratio		0.61			0.30			0.68			0.38	
Uniform Delay, d1		10.5			9.4			10.2			8.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.9			0.3			3.7			0.4	
Delay (s)		12.4			9.7			13.9			9.3	
Level of Service		B			A			B			A	
Approach Delay (s)		12.4			9.7			13.9			9.3	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	36.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.6%	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)	23	116	148	26	160	13	204	191	26	9	139	23
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			6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt		1.00	0.85	1.00	0.99		1.00	0.98			0.98	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		1847	1583	1770	1842		1770	1830			1824	
Flt Permitted		0.92	1.00	0.66	1.00		0.64	1.00			0.97	
Satd. Flow (perm)		1715	1583	1231	1842		1193	1830			1768	
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)	25	126	161	28	174	14	222	208	28	10	151	25
RTOR Reduction (vph)	0	0	102	0	7	0	0	14	0	0	16	0
Lane Group Flow (vph)	0	151	59	28	181	0	222	222	0	0	170	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		12.1	12.1	12.1	12.1		9.0	9.0			9.0	
Effective Green, g (s)		12.1	12.1	12.1	12.1		9.0	9.0			9.0	
Actuated g/C Ratio		0.37	0.37	0.37	0.37		0.27	0.27			0.27	
Clearance Time (s)		6.0	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			3.0	
Lane Grp Cap (vph)		627	579	450	673		324	498			481	
v/s Ratio Prot					c0.10			0.12				
v/s Ratio Perm		0.09	0.04	0.02			c0.19				0.10	
v/c Ratio		0.24	0.10	0.06	0.27		0.69	0.45			0.35	
Uniform Delay, d1		7.3	6.9	6.8	7.4		10.8	10.0			9.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.2	0.1	0.1	0.2		5.9	0.6			0.4	
Delay (s)		7.5	7.0	6.9	7.6		16.7	10.6			10.2	
Level of Service		A	A	A	A		B	B			B	
Approach Delay (s)		7.2			7.5			13.6			10.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	33.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	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)	23	160	204	26	116	9	148	139	26	13	191	23
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			6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt		1.00	0.85	1.00	0.99		1.00	0.98			0.99	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		1851	1583	1770	1842		1770	1819			1832	
Flt Permitted		0.95	1.00	0.63	1.00		0.79	1.00			0.97	
Satd. Flow (perm)		1764	1583	1179	1842		1473	1819			1775	
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)	25	174	222	28	126	10	161	151	28	14	208	25
RTOR Reduction (vph)	0	0	137	0	6	0	0	18	0	0	10	0
Lane Group Flow (vph)	0	199	85	28	130	0	161	161	0	0	237	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		12.5	12.5	12.5	12.5		8.2	8.2			8.2	
Effective Green, g (s)		12.5	12.5	12.5	12.5		8.2	8.2			8.2	
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.25	0.25			0.25	
Clearance Time (s)		6.0	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			3.0	
Lane Grp Cap (vph)		674	605	451	704		369	456			445	
v/s Ratio Prot					0.07			0.09				
v/s Ratio Perm		c0.11	0.05	0.02			0.11				c0.13	
v/c Ratio		0.30	0.14	0.06	0.18		0.44	0.35			0.53	
Uniform Delay, d1		7.0	6.6	6.4	6.7		10.3	10.1			10.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.2	0.1	0.1	0.1		0.8	0.5			1.2	
Delay (s)		7.3	6.7	6.4	6.8		11.1	10.5			11.8	
Level of Service		A	A	A	A		B	B			B	
Approach Delay (s)		7.0			6.8			10.8			11.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	32.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	707	180	180	162	223	976
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	768	196	196	176	242	1061
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	1340	773	1303			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1340	773	1303			
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	51	63			
cM capacity (veh/h)	104	396	525			

Direction, Lane #	SB 1	SB 2	SE 1	NW 1
Volume Total	768	196	372	1303
Volume Left	768	0	196	0
Volume Right	0	196	0	1061
cSH	104	396	525	1700
Volume to Capacity	7.36	0.49	0.37	0.77
Queue Length 95th (ft)	Err	66	43	0
Control Delay (s)	Err	22.7	11.5	0.0
Lane LOS	F	C	B	
Approach Delay (s)	7974.5		11.5	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	2914.9		
Intersection Capacity Utilization	139.5%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	976	180	180	223	162	707
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1061	196	196	242	176	768
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	1194	560	945			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1194	560	945			
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	63	73			
cM capacity (veh/h)	149	524	718			

Direction, Lane #	SB 1	SB 2	SE 1	NW 1
Volume Total	1061	196	438	945
Volume Left	1061	0	196	0
Volume Right	0	196	0	768
cSH	149	524	718	1700
Volume to Capacity	7.14	0.37	0.27	0.56
Queue Length 95th (ft)	Err	43	28	0
Control Delay (s)	Err	15.9	7.4	0.0
Lane LOS	F	C	A	
Approach Delay (s)	8444.5		7.4	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	4021.8		
Intersection Capacity Utilization	137.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	707	180	180	162	223	976
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.97			1.00	1.00	
Frt	0.97			1.00	0.89	
Flt Protected	0.96			0.97	1.00	
Satd. Flow (prot)	3305			1780	1626	
Flt Permitted	0.96			0.13	1.00	
Satd. Flow (perm)	3305			232	1626	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	768	196	196	176	242	1061
RTOR Reduction (vph)	58	0	0	0	394	0
Lane Group Flow (vph)	906	0	0	372	909	0
Turn Type			Perm			
Protected Phases	4			6	2	
Permitted Phases			6			
Actuated Green, G (s)	6.0			22.0	22.0	
Effective Green, g (s)	8.0			24.0	24.0	
Actuated g/C Ratio	0.20			0.60	0.60	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	661			139	976	
v/s Ratio Prot	c0.27				0.56	
v/s Ratio Perm				c1.60		
v/c Ratio	1.37			2.68	0.93	
Uniform Delay, d1	16.0			8.0	7.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	176.1			774.5	14.9	
Delay (s)	192.1			782.5	22.2	
Level of Service	F			F	C	
Approach Delay (s)	192.1			782.5	22.2	
Approach LOS	F			F	C	

Intersection Summary			
HCM Average Control Delay	191.4	HCM Level of Service	F
HCM Volume to Capacity ratio	2.35		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	976	180	180	223	162	707
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.97			1.00	1.00	
Frt	0.98			1.00	0.89	
Flt Protected	0.96			0.98	1.00	
Satd. Flow (prot)	3321			1787	1626	
Flt Permitted	0.96			0.25	1.00	
Satd. Flow (perm)	3321			456	1626	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1061	196	196	242	176	768
RTOR Reduction (vph)	16	0	0	0	157	0
Lane Group Flow (vph)	1241	0	0	438	787	0
Turn Type			Perm			
Protected Phases	4			6	2	
Permitted Phases			6			
Actuated Green, G (s)	24.0			64.0	64.0	
Effective Green, g (s)	26.0			66.0	66.0	
Actuated g/C Ratio	0.26			0.66	0.66	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	863			301	1073	
v/s Ratio Prot	c0.37				0.48	
v/s Ratio Perm				c0.96		
v/c Ratio	1.44			1.46	0.73	
Uniform Delay, d1	37.0			17.0	11.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	204.0			222.4	2.6	
Delay (s)	241.0			239.4	13.8	
Level of Service	F			F	B	
Approach Delay (s)	241.0			239.4	13.8	
Approach LOS	F			F	B	

Intersection Summary			
HCM Average Control Delay	159.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	117.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	180	162	223	976	707	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frt	1.00	1.00	0.90	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	3471	2982	1413	3367	1553
Flt Permitted	0.21	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	385	3471	2982	1413	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	176	242	1061	768	196
RTOR Reduction (vph)	0	0	366	365	0	129
Lane Group Flow (vph)	196	176	407	165	768	67
Turn Type	pm+pt			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases	6			2		8
Actuated Green, G (s)	21.9	21.9	13.0	13.0	14.4	14.4
Effective Green, g (s)	23.9	23.9	15.0	15.0	16.4	16.4
Actuated g/C Ratio	0.49	0.49	0.31	0.31	0.34	0.34
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)	328	1718	926	439	1143	527
v/s Ratio Prot	c0.06	0.05	0.14		c0.23	
v/s Ratio Perm	c0.24			0.12		0.04
v/c Ratio	0.60	0.10	0.44	0.37	0.67	0.13
Uniform Delay, d1	8.4	6.5	13.3	13.0	13.6	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.0	0.3	0.5	1.6	0.1
Delay (s)	11.3	6.5	13.6	13.5	15.2	11.1
Level of Service	B	A	B	B	B	B
Approach Delay (s)		9.0	13.6		14.4	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	180	223	162	707	976	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.91	0.91	0.97	1.00
Frt	1.00	1.00	0.90	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	3471	2983	1413	3367	1553
Flt Permitted	0.25	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	457	3471	2983	1413	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	242	176	768	1061	196
RTOR Reduction (vph)	0	0	292	292	0	113
Lane Group Flow (vph)	196	242	268	92	1061	83
Turn Type	pm+pt			Perm		Perm
Protected Phases	1	6	2		8	
Permitted Phases	6			2		8
Actuated Green, G (s)	19.0	19.0	10.0	10.0	19.2	19.2
Effective Green, g (s)	21.0	21.0	12.0	12.0	21.2	21.2
Actuated g/C Ratio	0.42	0.42	0.24	0.24	0.42	0.42
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)	319	1452	713	338	1422	656
v/s Ratio Prot	c0.06	0.07	0.09		c0.32	
v/s Ratio Perm	c0.20			0.06		0.05
v/c Ratio	0.61	0.17	0.38	0.27	0.75	0.13
Uniform Delay, d1	10.4	9.1	16.0	15.5	12.2	8.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	0.3	0.4	2.2	0.1
Delay (s)	13.9	9.2	16.3	16.0	14.4	8.9
Level of Service	B	A	B	B	B	A
Approach Delay (s)		11.3	16.2		13.6	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	50.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	476	148	204	30	20	476
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	517	161	222	33	22	517
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	254				1434	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	254				1434	238
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	60				75	35
cM capacity (veh/h)	1299				88	796

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	678	254	539
Volume Left	517	0	22
Volume Right	0	33	517
cSH	1299	1700	601
Volume to Capacity	0.40	0.15	0.90
Queue Length 95th (ft)	49	0	272
Control Delay (s)	8.3	0.0	42.2
Lane LOS	A		E
Approach Delay (s)	8.3	0.0	42.2
Approach LOS			E

Intersection Summary			
Average Delay	19.3		
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	476	204	148	20	30	476
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	517	222	161	22	33	517
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	183				1428	172
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183				1428	172
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	63				65	40
cM capacity (veh/h)	1380				92	867

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	739	183	550
Volume Left	517	0	33
Volume Right	0	22	517
cSH	1380	1700	578
Volume to Capacity	0.37	0.11	0.95
Queue Length 95th (ft)	44	0	318
Control Delay (s)	7.6	0.0	53.1
Lane LOS	A		F
Approach Delay (s)	7.6	0.0	53.1
Approach LOS			F

Intersection Summary			
Average Delay	23.6		
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	476	148	204	30	20	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.98		0.87	
Flt Protected		0.96	1.00		1.00	
Satd. Flow (prot)		1760	1795		1587	
Flt Permitted		0.62	1.00		1.00	
Satd. Flow (perm)		1136	1795		1587	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	161	222	33	22	517
RTOR Reduction (vph)	0	0	6	0	444	0
Lane Group Flow (vph)	0	678	249	0	95	0
Turn Type	Perm					
Protected Phases		4	4		6	
Permitted Phases	4					
Actuated Green, G (s)		43.6	43.6		9.1	
Effective Green, g (s)		43.6	43.6		9.1	
Actuated g/C Ratio		0.67	0.67		0.14	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		766	1210		223	
v/s Ratio Prot			0.14		c0.06	
v/s Ratio Perm		c0.60				
v/c Ratio		0.89	0.21		0.42	
Uniform Delay, d1		8.5	4.0		25.4	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		11.9	0.1		1.3	
Delay (s)		20.4	4.1		26.7	
Level of Service		C	A		C	
Approach Delay (s)		20.4	4.1		26.7	
Approach LOS		C	A		C	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	476	204	148	20	30	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.98		0.87	
Flt Protected		0.97	1.00		1.00	
Satd. Flow (prot)		1765	1797		1590	
Flt Permitted		0.68	1.00		1.00	
Satd. Flow (perm)		1245	1797		1590	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	222	161	22	33	517
RTOR Reduction (vph)	0	0	6	0	441	0
Lane Group Flow (vph)	0	739	177	0	109	0
Turn Type	Perm					
Protected Phases		4	4		6	
Permitted Phases	4					
Actuated Green, G (s)		43.1	43.1		9.5	
Effective Green, g (s)		43.1	43.1		9.5	
Actuated g/C Ratio		0.67	0.67		0.15	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		831	1199		234	
v/s Ratio Prot			0.10		c0.07	
v/s Ratio Perm		c0.59				
v/c Ratio		0.89	0.15		0.47	
Uniform Delay, d1		8.8	4.0		25.2	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		11.4	0.1		1.5	
Delay (s)		20.2	4.0		26.7	
Level of Service		C	A		C	
Approach Delay (s)		20.2	4.0		26.7	
Approach LOS		C	A		C	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	64.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	476	148	204	30	20	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	0.91	0.91	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	0.97	1.00		0.95	1.00
Satd. Flow (prot)	1579	3226	3404		1736	1553
Flt Permitted	0.59	0.69	1.00		0.95	1.00
Satd. Flow (perm)	987	2297	3404		1736	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	161	222	33	22	517
RTOR Reduction (vph)	0	0	19	0	0	394
Lane Group Flow (vph)	258	420	236	0	22	123
Turn Type	Perm					Perm
Protected Phases		4	4		6	
Permitted Phases	4					6
Actuated Green, G (s)	15.2	15.2	15.2		8.5	8.5
Effective Green, g (s)	15.2	15.2	15.2		8.5	8.5
Actuated g/C Ratio	0.43	0.43	0.43		0.24	0.24
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)	420	978	1449		413	370
v/s Ratio Prot			0.07		0.01	
v/s Ratio Perm	c0.26	0.18				c0.08
v/c Ratio	0.61	0.43	0.16		0.05	0.33
Uniform Delay, d1	8.0	7.2	6.3		10.5	11.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.7	0.3	0.1		0.1	0.5
Delay (s)	10.6	7.5	6.4		10.5	11.8
Level of Service	B	A	A		B	B
Approach Delay (s)		8.7	6.4		11.7	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	35.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	476	204	148	20	30	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	0.91	0.91	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	0.97	1.00		0.95	1.00
Satd. Flow (prot)	1579	3238	3409		1736	1553
Flt Permitted	0.64	0.73	1.00		0.95	1.00
Satd. Flow (perm)	1058	2443	3409		1736	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	222	161	22	33	517
RTOR Reduction (vph)	0	0	13	0	0	392
Lane Group Flow (vph)	258	481	170	0	33	125
Turn Type	Perm					Perm
Protected Phases		4	4		6	
Permitted Phases	4					6
Actuated Green, G (s)	14.7	14.7	14.7		8.5	8.5
Effective Green, g (s)	14.7	14.7	14.7		8.5	8.5
Actuated g/C Ratio	0.42	0.42	0.42		0.24	0.24
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)	442	1020	1424		419	375
v/s Ratio Prot			0.05		0.02	
v/s Ratio Perm	c0.24	0.20				c0.08
v/c Ratio	0.58	0.47	0.12		0.08	0.33
Uniform Delay, d1	7.9	7.4	6.3		10.3	11.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.3	0.0		0.1	0.5
Delay (s)	9.9	7.8	6.3		10.4	11.5
Level of Service	A	A	A		B	B
Approach Delay (s)		8.5	6.3		11.5	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	35.2	Sum of lost time (s)	12.0
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												
Volume (veh/h)	32	707	18	338	976	542	26	306	338	393	222	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	768	20	367	1061	589	28	333	367	427	241	35
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	1650			788			3093	3233	778	3472	2948	1355
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1650			788			3093	3233	778	3472	2948	1355
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 %	91			55			0	0	7	0	0	81
cM capacity (veh/h)	386			823			0	5	393	0	7	181

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	823	2017	728	703
Volume Left	35	367	28	427
Volume Right	20	589	367	35
cSH	386	823	0	0
Volume to Capacity	0.09	0.45	Err	Err
Queue Length 95th (ft)	7	58	Err	Err
Control Delay (s)	3.1	12.9	Err	Err
Lane LOS	A	B	F	F
Approach Delay (s)	3.1	12.9	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	230.1%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	976	26	338	707	393	18	222	338	542	306	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	1061	28	367	768	427	20	241	367	589	333	35
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	1196			1089			3062	3075	1075	3349	2876	982
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1196			1089			3062	3075	1075	3349	2876	982
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 %	94			42			0	0	0	0	0	88
cM capacity (veh/h)	577			633			0	5	264	0	6	300

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1124	1563	628	957
Volume Left	35	367	20	589
Volume Right	28	427	367	35
cSH	577	633	0	0
Volume to Capacity	0.06	0.58	Err	Err
Queue Length 95th (ft)	5	93	Err	Err
Control Delay (s)	2.3	18.2	Err	Err
Lane LOS	A	C	F	F
Approach Delay (s)	2.3	18.2	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	229.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	707	18	338	976	542	26	306	338	393	222	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.93			0.99	
Flt Protected		1.00			0.99			1.00			0.97	
Satd. Flow (prot)		1817			1739			1699			1761	
Flt Permitted		0.88			0.53			1.00			0.97	
Satd. Flow (perm)		1609			935			1699			1761	
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)	35	768	20	367	1061	589	28	333	367	427	241	35
RTOR Reduction (vph)	0	1	0	0	10	0	0	24	0	0	2	0
Lane Group Flow (vph)	0	822	0	0	2007	0	0	704	0	0	701	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		6			6		2	2		4	4	
Permitted Phases	6			6								
Actuated Green, G (s)		68.0			68.0			33.0			31.0	
Effective Green, g (s)		70.0			70.0			33.0			31.0	
Actuated g/C Ratio		0.47			0.47			0.22			0.21	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		751			436			374			364	
v/s Ratio Prot								c0.41			c0.40	
v/s Ratio Perm		0.51			c2.15							
v/c Ratio		1.10			4.60			1.88			1.93	
Uniform Delay, d1		40.0			40.0			58.5			59.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		61.9			1626.6			406.9			427.2	
Delay (s)		101.9			1666.6			465.4			486.7	
Level of Service		F			F			F			F	
Approach Delay (s)		101.9			1666.6			465.4			486.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	966.1	HCM Level of Service	F
HCM Volume to Capacity ratio	3.31		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	233.4%	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)	32	976	26	338	707	393	18	222	338	542	306	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.92			1.00	
Flt Protected		1.00			0.99			1.00			0.97	
Satd. Flow (prot)		1818			1739			1680			1764	
Flt Permitted		0.96			0.69			0.99			0.81	
Satd. Flow (perm)		1747			1215			1662			1468	
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)	35	1061	28	367	768	427	20	241	367	589	333	35
RTOR Reduction (vph)	0	2	0	0	28	0	0	113	0	0	3	0
Lane Group Flow (vph)	0	1122	0	0	1534	0	0	515	0	0	954	0
Turn Type	Perm			Prot			Perm			Prot		
Protected Phases		6		5	6			2		1	2	
Permitted Phases	6						2					
Actuated Green, G (s)		4.0			4.0			4.0			4.0	
Effective Green, g (s)		6.0			6.0			4.0			4.0	
Actuated g/C Ratio		0.30			0.30			0.20			0.20	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		524			365			332			294	
v/s Ratio Prot												
v/s Ratio Perm		0.64			c1.26			0.31			c0.65	
v/c Ratio		2.14			4.20			1.55			3.24	
Uniform Delay, d1		7.0			7.0			8.0			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		519.8			1447.7			262.7			1018.7	
Delay (s)		526.8			1454.7			270.7			1026.7	
Level of Service		F			F			F			F	
Approach Delay (s)		526.8			1454.7			270.7			1026.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	940.5	HCM Level of Service	F
HCM Volume to Capacity ratio	3.82		
Actuated Cycle Length (s)	20.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	232.7%	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)	32	707	18	338	976	542	26	306	338	393	222	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		4.0	4.0	6.0	4.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	3458		3367	3471	1553	1736	3471	1553	3367	3405	
Flt Permitted	0.33	1.00		0.95	1.00	1.00	0.58	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	609	3458		3367	3471	1553	1063	3471	1553	3367	3405	
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)	35	768	20	367	1061	589	28	333	367	427	241	35
RTOR Reduction (vph)	0	3	0	0	0	7	0	0	15	0	21	0
Lane Group Flow (vph)	35	785	0	367	1061	582	28	333	352	427	255	0
Turn Type	Perm			Prot		custom	Perm		custom	Prot		
Protected Phases		6		5	2	2		8	8	7	4	
Permitted Phases	6					7	8		5			
Actuated Green, G (s)	12.0	12.0		5.0	23.0	31.0	6.0	6.0	11.0	8.0	20.0	
Effective Green, g (s)	12.0	14.0		7.0	25.0	31.0	8.0	6.0	11.0	8.0	20.0	
Actuated g/C Ratio	0.22	0.25		0.13	0.45	0.56	0.15	0.11	0.20	0.15	0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0	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	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	133	880		429	1578	1045	155	379	480	490	1238	
v/s Ratio Prot		c0.23		c0.11	0.31	0.23		0.10	c0.08	c0.13	0.07	
v/s Ratio Perm	0.06					0.14	0.03		0.15			
v/c Ratio	0.26	0.89		0.86	0.67	0.56	0.18	0.88	0.73	0.87	0.21	
Uniform Delay, d1	17.8	19.8		23.5	11.8	7.6	20.6	24.1	20.6	23.0	12.0	
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	1.1	11.3		15.3	1.1	0.6	0.6	19.9	5.7	15.5	0.1	
Delay (s)	18.9	31.1		38.8	12.9	8.3	21.2	44.1	26.3	38.5	12.1	
Level of Service	B	C		D	B	A	C	D	C	D	B	
Approach Delay (s)		30.6			16.3			34.3			28.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.3%	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)	32	976	26	338	707	393	18	222	338	542	306	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		2.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	3458		3367	3471	1553	1736	3471	1553	3367	3422	
Flt Permitted	0.36	1.00		0.95	1.00	1.00	0.53	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	659	3458		3367	3471	1553	973	3471	1553	3367	3422	
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)	35	1061	28	367	768	427	20	241	367	589	333	35
RTOR Reduction (vph)	0	3	0	0	0	8	0	0	16	0	11	0
Lane Group Flow (vph)	35	1086	0	367	768	419	20	241	351	589	357	0
Turn Type	Perm			Prot		custom	Perm		custom	Prot		
Protected Phases		6		5	2	2		8	8	7	4	
Permitted Phases	6					7	8		5			
Actuated Green, G (s)	23.5	23.5		7.0	34.5	47.5	6.0	6.0	13.0	13.0	23.0	
Effective Green, g (s)	23.5	25.5		9.0	36.5	47.5	8.0	6.0	13.0	13.0	23.0	
Actuated g/C Ratio	0.34	0.37		0.13	0.53	0.68	0.12	0.09	0.19	0.19	0.33	
Clearance Time (s)	6.0	6.0		4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	
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)	223	1269		436	1823	1195	112	300	425	630	1132	
v/s Ratio Prot		c0.31		0.11	0.22	0.17		0.07	c0.07	c0.17	0.10	
v/s Ratio Perm	0.05					0.10	0.02		0.15			
v/c Ratio	0.16	0.86		0.84	0.42	0.35	0.18	0.80	0.83	0.93	0.32	
Uniform Delay, d1	16.1	20.3		29.6	10.1	4.6	27.8	31.2	27.2	27.8	17.4	
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	0.3	5.9		13.7	0.2	0.2	0.8	14.3	12.3	21.2	0.2	
Delay (s)	16.4	26.2		43.3	10.2	4.8	28.5	45.5	39.5	49.0	17.5	
Level of Service	B	C		D	B	A	C	D	D	D	B	
Approach Delay (s)		25.9			16.5			41.4			36.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	254	485	40	351	670	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	276	527	43	382	728	43
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			803		1008	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			803		1008	540
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	92
cM capacity (veh/h)			812		250	538

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	803	425	772
Volume Left	0	43	728
Volume Right	527	0	43
cSH	1700	812	258
Volume to Capacity	0.47	0.05	2.99
Queue Length 95th (ft)	0	4	1712
Control Delay (s)	0.0	1.6	936.3
Lane LOS		A	F
Approach Delay (s)	0.0	1.6	936.3
Approach LOS			F

Intersection Summary			
Average Delay	361.6		
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	351	670	40	254	485	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	382	728	43	276	527	43
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			1110		1109	746
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1110		1109	746
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		0	89
cM capacity (veh/h)			622		214	410

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1110	320	571
Volume Left	0	43	527
Volume Right	728	0	43
cSH	1700	622	222
Volume to Capacity	0.65	0.07	2.57
Queue Length 95th (ft)	0	6	1201
Control Delay (s)	0.0	2.3	753.6
Lane LOS		A	F
Approach Delay (s)	0.0	2.3	753.6
Approach LOS			F

Intersection Summary			
Average Delay	215.4		
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	254	485	40	351	670	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.91			1.00	0.99	
Flt Protected	1.00			0.99	0.95	
Satd. Flow (prot)	1665			1818	1731	
Flt Permitted	1.00			0.48	0.95	
Satd. Flow (perm)	1665			882	1731	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	527	43	382	728	43
RTOR Reduction (vph)	86	0	0	0	3	0
Lane Group Flow (vph)	717	0	0	425	768	0
Turn Type			Perm			
Protected Phases	6			2	4	
Permitted Phases			2			
Actuated Green, G (s)	36.0			36.0	32.0	
Effective Green, g (s)	38.0			38.0	34.0	
Actuated g/C Ratio	0.48			0.48	0.42	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	791			419	736	
v/s Ratio Prot	0.43				c0.44	
v/s Ratio Perm				c0.48		
v/c Ratio	0.91			1.01	1.04	
Uniform Delay, d1	19.4			21.0	23.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	13.9			47.6	45.1	
Delay (s)	33.3			68.6	68.1	
Level of Service	C			E	E	
Approach Delay (s)	33.3			68.6	68.1	
Approach LOS	C			E	E	

Intersection Summary			
HCM Average Control Delay	54.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	351	670	40	254	485	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.91			1.00	0.99	
Flt Protected	1.00			0.99	0.96	
Satd. Flow (prot)	1665			1815	1728	
Flt Permitted	1.00			0.34	0.96	
Satd. Flow (perm)	1665			628	1728	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	728	43	276	527	43
RTOR Reduction (vph)	98	0	0	0	4	0
Lane Group Flow (vph)	1012	0	0	319	566	0
Turn Type			Perm			
Protected Phases	6			2	4	
Permitted Phases			2			
Actuated Green, G (s)	39.0			39.0	19.0	
Effective Green, g (s)	41.0			41.0	21.0	
Actuated g/C Ratio	0.59			0.59	0.30	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	975			368	518	
v/s Ratio Prot	c0.61				c0.33	
v/s Ratio Perm				0.51		
v/c Ratio	1.04			0.87	1.09	
Uniform Delay, d1	14.5			12.2	24.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	39.1			18.8	67.0	
Delay (s)	53.6			31.0	91.5	
Level of Service	D			C	F	
Approach Delay (s)	53.6			31.0	91.5	
Approach LOS	D			C	F	

Intersection Summary			
HCM Average Control Delay	60.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	254	485	40	351	670	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.97	1.00
Frt	0.93	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		0.99	0.95	1.00
Satd. Flow (prot)	3081	1413		3454	3367	1553
Flt Permitted	1.00	1.00		0.86	0.95	1.00
Satd. Flow (perm)	3081	1413		2972	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	527	43	382	728	43
RTOR Reduction (vph)	169	168	0	0	0	28
Lane Group Flow (vph)	371	95	0	425	728	15
Turn Type		Perm	Perm			Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	10.8	10.8		10.8	12.8	12.8
Effective Green, g (s)	12.8	12.8		12.8	14.8	12.8
Actuated g/C Ratio	0.36	0.36		0.36	0.42	0.36
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)	1108	508		1069	1400	558
v/s Ratio Prot	0.12				c0.22	
v/s Ratio Perm		0.07		c0.14		0.01
v/c Ratio	0.33	0.19		0.40	0.52	0.03
Uniform Delay, d1	8.3	7.8		8.5	7.8	7.4
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		0.2	0.4	0.0
Delay (s)	8.5	8.0		8.8	8.1	7.4
Level of Service	A	A		A	A	A
Approach Delay (s)	8.3			8.8	8.1	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	35.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	351	670	40	254	485	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.97	1.00
Frt	0.93	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		0.99	0.95	1.00
Satd. Flow (prot)	3082	1413		3448	3367	1553
Flt Permitted	1.00	1.00		0.81	0.95	1.00
Satd. Flow (perm)	3082	1413		2801	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	382	728	43	276	527	43
RTOR Reduction (vph)	218	218	0	0	0	29
Lane Group Flow (vph)	528	146	0	319	527	14
Turn Type		Perm	Perm			Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Actuated Green, G (s)	12.1	12.1		12.1	11.1	11.1
Effective Green, g (s)	14.1	14.1		14.1	13.1	11.1
Actuated g/C Ratio	0.40	0.40		0.40	0.37	0.32
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)	1235	566		1122	1253	490
v/s Ratio Prot	c0.17				c0.16	
v/s Ratio Perm		0.10		0.11		0.01
v/c Ratio	0.43	0.26		0.28	0.42	0.03
Uniform Delay, d1	7.6	7.1		7.1	8.2	8.3
Progression Factor	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		0.1	0.2	0.0
Delay (s)	7.9	7.3		7.3	8.5	8.3
Level of Service	A	A		A	A	A
Approach Delay (s)	7.7			7.3	8.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	35.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	40	725	1002	849	614	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	788	1089	923	667	43
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	2012				2426	1551
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2012				2426	1551
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				0	69
cM capacity (veh/h)	279				29	138

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	832	2012	711
Volume Left	43	0	667
Volume Right	0	923	43
cSH	279	1700	31
Volume to Capacity	0.16	1.18	22.99
Queue Length 95th (ft)	14	0	Err
Control Delay (s)	6.6	0.0	Err
Lane LOS	A		F
Approach Delay (s)	6.6	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay	2001.4		
Intersection Capacity Utilization	147.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	40	1002	725	614	849	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	1089	788	667	923	43
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	1455				2298	1122
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1455				2298	1122
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				0	82
cM capacity (veh/h)	459				38	248

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1133	1455	966
Volume Left	43	0	923
Volume Right	0	667	43
cSH	459	1700	40
Volume to Capacity	0.09	0.86	24.40
Queue Length 95th (ft)	8	0	Err
Control Delay (s)	4.0	0.0	Err
Lane LOS	A		F
Approach Delay (s)	4.0	0.0	9999.0
Approach LOS			F

Intersection Summary			
Average Delay	2719.7		
Intersection Capacity Utilization	141.3%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	40	725	1002	849	614	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.94		0.99	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		1822	1714		1731	
Flt Permitted		0.29	1.00		0.96	
Satd. Flow (perm)		522	1714		1731	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	788	1089	923	667	43
RTOR Reduction (vph)	0	0	30	0	2	0
Lane Group Flow (vph)	0	831	1982	0	708	0
Turn Type	Perm					
Protected Phases		6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		62.0	62.0		26.0	
Effective Green, g (s)		62.0	62.0		26.0	
Actuated g/C Ratio		0.62	0.62		0.26	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		324	1063		450	
v/s Ratio Prot			1.16		c0.41	
v/s Ratio Perm		c1.59				
v/c Ratio		2.56	1.86		1.57	
Uniform Delay, d1		19.0	19.0		37.0	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		713.2	392.5		268.3	
Delay (s)		732.2	411.5		305.3	
Level of Service		F	F		F	
Approach Delay (s)		732.2	411.5		305.3	
Approach LOS		F	F		F	

Intersection Summary			
HCM Average Control Delay	465.3	HCM Level of Service	F
HCM Volume to Capacity ratio	2.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	151.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	40	1002	725	614	849	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		1.00	
Frt		1.00	0.94		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1823	1714		1733	
Flt Permitted		0.28	1.00		0.95	
Satd. Flow (perm)		503	1714		1733	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1089	788	667	923	43
RTOR Reduction (vph)	0	0	30	0	1	0
Lane Group Flow (vph)	0	1132	1425	0	965	0
Turn Type	Perm					
Protected Phases		6	2		4	
Permitted Phases	6					
Actuated Green, G (s)		56.0	56.0		32.0	
Effective Green, g (s)		56.0	56.0		32.0	
Actuated g/C Ratio		0.56	0.56		0.32	
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		282	960		555	
v/s Ratio Prot			0.83		c0.56	
v/s Ratio Perm		c2.25				
v/c Ratio		4.01	1.48		1.74	
Uniform Delay, d1		22.0	22.0		34.0	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		1364.8	223.4		339.6	
Delay (s)		1386.8	245.4		373.6	
Level of Service		F	F		F	
Approach Delay (s)		1386.8	245.4		373.6	
Approach LOS		F	F		F	

Intersection Summary			
HCM Average Control Delay	643.9	HCM Level of Service	F
HCM Volume to Capacity ratio	3.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	144.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	40	725	1002	849	614	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	6.0
Lane Util. Factor		0.95	0.95	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3462	3471	1553	3367	1553
Flt Permitted		0.86	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2978	3471	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	788	1089	923	667	43
RTOR Reduction (vph)	0	0	0	0	0	31
Lane Group Flow (vph)	0	831	1089	923	667	12
Turn Type	Perm			pm+ov		Perm
Protected Phases		6	2	4	4	
Permitted Phases	6			2		4
Actuated Green, G (s)		20.6	20.6	32.7	12.1	12.1
Effective Green, g (s)		22.6	22.6	36.7	14.1	12.1
Actuated g/C Ratio		0.51	0.51	0.82	0.32	0.27
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)		1506	1755	1553	1062	420
v/s Ratio Prot			0.31	c0.19	0.20	
v/s Ratio Perm		0.28		0.41		0.01
v/c Ratio		0.55	0.62	0.59	0.63	0.03
Uniform Delay, d1		7.6	8.0	1.4	13.1	12.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4	0.7	0.6	1.2	0.0
Delay (s)		8.0	8.6	2.0	14.2	12.0
Level of Service		A	A	A	B	B
Approach Delay (s)		8.0	5.6		14.1	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	44.7	Sum of lost time (s)	0.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	40	1002	725	614	849	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	6.0
Lane Util. Factor		0.95	0.95	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3465	3471	1553	3367	1553
Flt Permitted		0.90	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3126	3471	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1089	788	667	923	43
RTOR Reduction (vph)	0	0	0	348	0	30
Lane Group Flow (vph)	0	1132	788	319	923	13
Turn Type	Perm			Perm		Perm
Protected Phases		6	2		4	
Permitted Phases	6			2		4
Actuated Green, G (s)		18.9	18.9	18.9	12.8	12.8
Effective Green, g (s)		20.9	20.9	20.9	14.8	12.8
Actuated g/C Ratio		0.48	0.48	0.48	0.34	0.29
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)		1495	1660	743	1140	455
v/s Ratio Prot			0.23		c0.27	
v/s Ratio Perm		c0.36		0.21		0.01
v/c Ratio		0.76	0.47	0.43	0.81	0.03
Uniform Delay, d1		9.3	7.7	7.5	13.2	11.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.2	0.2	0.4	4.3	0.0
Delay (s)		11.6	7.9	7.9	17.5	11.0
Level of Service		B	A	A	B	B
Approach Delay (s)		11.6	7.9		17.2	
Approach LOS		B	A		B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	43.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	97	536	740	160	116	97
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	105	583	804	174	126	105
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	1961	179	232			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1961	179	232			
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	32	39			
cM capacity (veh/h)	27	859	1324			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	688	978	232
Volume Left	105	804	0
Volume Right	583	0	105
cSH	150	1324	1700
Volume to Capacity	4.58	0.61	0.14
Queue Length 95th (ft)	Err	109	0
Control Delay (s)	Err	11.1	0.0
Lane LOS	F	B	
Approach Delay (s)	Err	11.1	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	3630.8		
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	97	740	536	116	160	97
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	105	804	583	126	174	105
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	1518	227	279			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1518	227	279			
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	0	54			
cM capacity (veh/h)	70	808	1272			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	910	709	279
Volume Left	105	583	0
Volume Right	804	0	105
cSH	364	1272	1700
Volume to Capacity	2.50	0.46	0.16
Queue Length 95th (ft)	1821	62	0
Control Delay (s)	704.4	9.3	0.0
Lane LOS	F	A	
Approach Delay (s)	704.4	9.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	341.1		
Intersection Capacity Utilization	111.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	97	536	740	160	116	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.89			1.00	0.94	
Flt Protected	0.99			0.96	1.00	
Satd. Flow (prot)	1606			1755	1715	
Flt Permitted	0.99			0.62	1.00	
Satd. Flow (perm)	1606			1128	1715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	583	804	174	126	105
RTOR Reduction (vph)	247	0	0	0	35	0
Lane Group Flow (vph)	441	0	0	978	196	0
Turn Type			pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6		5			
Actuated Green, G (s)	16.0			20.0	20.0	
Effective Green, g (s)	16.0			20.0	20.0	
Actuated g/C Ratio	0.33			0.42	0.42	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	535			470	715	
v/s Ratio Prot					0.11	
v/s Ratio Perm	c0.27			c0.87		
v/c Ratio	0.82			2.08	0.27	
Uniform Delay, d1	14.7			14.0	9.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	10.0			493.6	0.2	
Delay (s)	24.7			507.6	9.4	
Level of Service	C			F	A	
Approach Delay (s)	24.7			507.6	9.4	
Approach LOS	C			F	A	

Intersection Summary			
HCM Average Control Delay	271.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	97	740	536	116	160	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.88			1.00	0.95	
Flt Protected	0.99			0.96	1.00	
Satd. Flow (prot)	1600			1755	1734	
Flt Permitted	0.99			0.59	1.00	
Satd. Flow (perm)	1600			1080	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	804	583	126	174	105
RTOR Reduction (vph)	327	0	0	0	26	0
Lane Group Flow (vph)	582	0	0	709	253	0
Turn Type			pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6		5			
Actuated Green, G (s)	19.0			17.0	17.0	
Effective Green, g (s)	19.0			17.0	17.0	
Actuated g/C Ratio	0.40			0.35	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	633			383	614	
v/s Ratio Prot					0.15	
v/s Ratio Perm	c0.36			c0.66		
v/c Ratio	0.92			1.85	0.41	
Uniform Delay, d1	13.8			15.5	11.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	18.4			393.0	0.4	
Delay (s)	32.2			408.5	12.2	
Level of Service	C			F	B	
Approach Delay (s)	32.2			408.5	12.2	
Approach LOS	C			F	B	

Intersection Summary			
HCM Average Control Delay	169.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	116.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	97	536	740	160	116	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	0.97	0.95	0.95	
Frt	0.90	0.85	1.00	1.00	0.93	
Flt Protected	0.99	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1611	1475	3367	3471	3234	
Flt Permitted	0.99	1.00	0.61	1.00	1.00	
Satd. Flow (perm)	1611	1475	2154	3471	3234	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	583	804	174	126	105
RTOR Reduction (vph)	129	259	0	0	88	0
Lane Group Flow (vph)	221	79	804	174	143	0
Turn Type		custom	pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6	6	5			
Actuated Green, G (s)	12.0	12.0	21.3	8.3	8.3	
Effective Green, g (s)	12.0	12.0	25.3	8.3	8.3	
Actuated g/C Ratio	0.23	0.23	0.49	0.16	0.16	
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)	377	345	1417	562	523	
v/s Ratio Prot			c0.17	0.05	0.04	
v/s Ratio Perm	c0.14	0.05	c0.11			
v/c Ratio	0.59	0.23	0.57	0.31	0.27	
Uniform Delay, d1	17.4	15.9	8.7	19.0	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.3	0.3	0.5	0.3	0.3	
Delay (s)	19.8	16.2	9.2	19.3	19.1	
Level of Service	B	B	A	B	B	
Approach Delay (s)	18.0			11.0	19.1	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	97	740	536	116	160	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	0.97	0.95	0.95	
Frt	0.88	0.85	1.00	1.00	0.94	
Flt Protected	0.99	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1597	1475	3367	3471	3275	
Flt Permitted	0.99	1.00	0.58	1.00	1.00	
Satd. Flow (perm)	1597	1475	2057	3471	3275	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	804	583	126	174	105
RTOR Reduction (vph)	178	329	0	0	88	0
Lane Group Flow (vph)	281	121	583	126	191	0
Turn Type		custom	pm+pt			
Protected Phases			4	5	5	
Permitted Phases	6	6	5			
Actuated Green, G (s)	13.9	13.9	19.7	8.5	8.5	
Effective Green, g (s)	13.9	13.9	23.7	8.5	8.5	
Actuated g/C Ratio	0.27	0.27	0.46	0.16	0.16	
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)	430	397	1280	572	539	
v/s Ratio Prot			c0.12	0.04	0.06	
v/s Ratio Perm	c0.18	0.08	c0.09			
v/c Ratio	0.65	0.31	0.46	0.22	0.35	
Uniform Delay, d1	16.7	15.0	9.1	18.7	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	0.4	0.3	0.2	0.4	
Delay (s)	20.3	15.4	9.4	18.9	19.5	
Level of Service	C	B	A	B	B	
Approach Delay (s)	17.9			11.1	19.5	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.7%	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)	92	425	111	128	587	153	153	345	128	111	249	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	462	121	139	638	166	166	375	139	121	271	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	804			583			1957	1805	522	2048	1782	721
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	804			583			1957	1805	522	2048	1782	721
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 %	88			86			0	0	75	0	0	77
cM capacity (veh/h)	820			992			0	60	554	0	62	427

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	683	943	680	491
Volume Left	100	139	166	121
Volume Right	121	166	139	100
cSH	820	992	0	0
Volume to Capacity	0.12	0.14	Err	Err
Queue Length 95th (ft)	10	12	Err	Err
Control Delay (s)	3.0	3.5	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	3.0	3.5	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	587	153	128	425	111	111	249	128	153	345	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	638	166	139	462	121	121	271	139	166	375	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	583			804			2009	1782	721	1996	1805	522
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	583			804			2009	1782	721	1996	1805	522
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 %	90			83			0	0	67	0	0	82
cM capacity (veh/h)	992			820			0	61	427	0	59	554

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	904	722	530	641
Volume Left	100	139	121	166
Volume Right	166	121	139	100
cSH	992	820	0	0
Volume to Capacity	0.10	0.17	Err	Err
Queue Length 95th (ft)	8	15	Err	Err
Control Delay (s)	2.5	4.1	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	2.5	4.1	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	425	111	128	587	153	153	345	128	111	249	92
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.97			0.97	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1805			1805			1789			1790	
Flt Permitted		0.68			0.73			0.70			0.64	
Satd. Flow (perm)		1243			1330			1263			1153	
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)	100	462	121	139	638	166	166	375	139	121	271	100
RTOR Reduction (vph)	0	5	0	0	5	0	0	6	0	0	6	0
Lane Group Flow (vph)	0	678	0	0	938	0	0	674	0	0	486	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		77.0			77.0			61.0			61.0	
Effective Green, g (s)		77.0			77.0			61.0			61.0	
Actuated g/C Ratio		0.51			0.51			0.41			0.41	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		638			683			514			469	
v/s Ratio Prot												
v/s Ratio Perm		0.55			c0.70			c0.53			0.42	
v/c Ratio		1.06			1.37			1.31			1.04	
Uniform Delay, d1		36.5			36.5			44.5			44.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		53.3			177.0			153.6			51.3	
Delay (s)		89.8			213.5			198.1			95.8	
Level of Service		F			F			F			F	
Approach Delay (s)		89.8			213.5			198.1			95.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	158.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	119.2%	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)	92	587	153	128	425	111	111	249	128	153	345	92
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.96			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1807			1803			1777			1800	
Flt Permitted		0.80			0.59			0.67			0.66	
Satd. Flow (perm)		1460			1071			1208			1209	
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)	100	638	166	139	462	121	121	271	139	166	375	100
RTOR Reduction (vph)	0	5	0	0	5	0	0	8	0	0	4	0
Lane Group Flow (vph)	0	899	0	0	717	0	0	523	0	0	637	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		77.0			77.0			61.0			61.0	
Effective Green, g (s)		77.0			77.0			61.0			61.0	
Actuated g/C Ratio		0.51			0.51			0.41			0.41	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		749			550			491			492	
v/s Ratio Prot												
v/s Ratio Perm		0.62			c0.67			0.43			c0.53	
v/c Ratio		1.20			1.30			1.06			1.29	
Uniform Delay, d1		36.5			36.5			44.5			44.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		102.6			149.6			58.9			147.0	
Delay (s)		139.1			186.1			103.4			191.5	
Level of Service		F			F			F			F	
Approach Delay (s)		139.1			186.1			103.4			191.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	156.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.2%	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)	92	425	111	128	587	153	153	345	128	111	249	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
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)	1736	3471	1553	1736	3471	1553	1736	3330		1736	3331	
Flt Permitted	0.33	1.00	1.00	0.42	1.00	1.00	0.50	1.00		0.38	1.00	
Satd. Flow (perm)	609	3471	1553	766	3471	1553	914	3330		703	3331	
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)	100	462	121	139	638	166	166	375	139	121	271	100
RTOR Reduction (vph)	0	0	91	0	0	125	0	75	0	0	75	0
Lane Group Flow (vph)	100	462	30	139	638	41	166	439	0	121	296	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	12.9	10.0	10.0	12.9	10.0	10.0	11.3	8.4		11.3	8.4	
Effective Green, g (s)	16.9	12.0	12.0	16.9	12.0	12.0	15.3	10.4		15.3	10.4	
Actuated g/C Ratio	0.35	0.25	0.25	0.35	0.25	0.25	0.32	0.22		0.32	0.22	
Clearance Time (s)	6.0	6.0	6.0	6.0	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	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	328	864	387	367	864	387	374	719		328	719	
v/s Ratio Prot	0.03	0.13		c0.04	c0.18		c0.05	c0.13		0.04	0.09	
v/s Ratio Perm	0.08		0.02	0.09		0.03	0.10			0.08		
v/c Ratio	0.30	0.53	0.08	0.38	0.74	0.11	0.44	0.61		0.37	0.41	
Uniform Delay, d1	11.0	15.7	13.9	11.1	16.7	14.0	12.4	17.1		12.2	16.3	
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	0.5	0.6	0.1	0.7	3.3	0.1	0.8	3.9		0.7	1.7	
Delay (s)	11.5	16.3	13.9	11.7	20.0	14.1	13.3	20.9		12.9	18.0	
Level of Service	B	B	B	B	B	B	B	C		B	B	
Approach Delay (s)		15.2			17.7			19.1			16.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.4%	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 (vph)	92	587	153	128	425	111	111	249	128	153	345	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
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)	1736	3471	1553	1736	3471	1553	1736	3295		1736	3362	
Flt Permitted	0.42	1.00	1.00	0.33	1.00	1.00	0.38	1.00		0.45	1.00	
Satd. Flow (perm)	766	3471	1553	609	3471	1553	703	3295		831	3362	
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)	100	638	166	139	462	121	121	271	139	166	375	100
RTOR Reduction (vph)	0	0	125	0	0	91	0	109	0	0	47	0
Lane Group Flow (vph)	100	638	41	139	462	30	121	301	0	166	428	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	12.9	10.0	10.0	12.9	10.0	10.0	11.3	8.4		11.3	8.4	
Effective Green, g (s)	16.9	12.0	12.0	16.9	12.0	12.0	15.3	10.4		15.3	10.4	
Actuated g/C Ratio	0.35	0.25	0.25	0.35	0.25	0.25	0.32	0.22		0.32	0.22	
Clearance Time (s)	6.0	6.0	6.0	6.0	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	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	367	864	387	328	864	387	328	711		356	725	
v/s Ratio Prot	0.03	c0.18		c0.04	0.13		0.04	0.09		c0.05	c0.13	
v/s Ratio Perm	0.07		0.03	0.11		0.02	0.08			0.10		
v/c Ratio	0.27	0.74	0.11	0.42	0.53	0.08	0.37	0.42		0.47	0.59	
Uniform Delay, d1	10.8	16.7	14.0	11.3	15.7	13.9	12.1	16.3		12.4	17.0	
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	0.4	3.3	0.1	0.9	0.6	0.1	0.7	1.8		1.0	3.5	
Delay (s)	11.2	20.0	14.1	12.2	16.3	13.9	12.8	18.2		13.4	20.5	
Level of Service	B	B	B	B	B	B	B	B		B	C	
Approach Delay (s)		17.9			15.1			16.9			18.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.1%	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)	157	416	55	89	574	236	77	459	89	171	333	157
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	452	60	97	624	257	84	499	97	186	362	171
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	880			512			2121	1897	482	2115	1799	752
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	880			512			2121	1897	482	2115	1799	752
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 %	78			91			0	0	83	0	0	58
cM capacity (veh/h)	768			1053			0	49	584	0	56	410

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	683	977	679	718
Volume Left	171	97	84	186
Volume Right	60	257	97	171
cSH	768	1053	0	0
Volume to Capacity	0.22	0.09	Err	Err
Queue Length 95th (ft)	21	8	Err	Err
Control Delay (s)	5.4	2.4	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	5.4	2.4	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	139.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	157	574	77	89	416	171	55	333	89	236	459	157
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	624	84	97	452	186	60	362	97	257	499	171
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	638			708			2166	1839	666	2023	1788	545
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	638			708			2166	1839	666	2023	1788	545
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 %	82			89			0	0	79	0	0	68
cM capacity (veh/h)	946			891			0	55	460	0	59	538

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	878	735	518	926
Volume Left	171	97	60	257
Volume Right	84	186	97	171
cSH	946	891	0	0
Volume to Capacity	0.18	0.11	Err	Err
Queue Length 95th (ft)	16	9	Err	Err
Control Delay (s)	4.3	2.7	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	4.3	2.7	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	149.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	416	55	89	574	236	77	459	89	171	333	157
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.98			0.97	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1818			1788			1816			1780	
Flt Permitted		0.48			0.84			0.80			0.57	
Satd. Flow (perm)		875			1502			1458			1019	
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)	171	452	60	97	624	257	84	499	97	186	362	171
RTOR Reduction (vph)	0	2	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	681	0	0	970	0	0	676	0	0	712	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		72.0			72.0			66.0			66.0	
Effective Green, g (s)		72.0			72.0			66.0			66.0	
Actuated g/C Ratio		0.48			0.48			0.44			0.44	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		420			721			642			448	
v/s Ratio Prot												
v/s Ratio Perm		c0.78			0.65			0.46			c0.70	
v/c Ratio		1.62			1.34			1.05			1.59	
Uniform Delay, d1		39.0			39.0			42.0			42.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		290.3			164.4			50.3			275.3	
Delay (s)		329.3			203.4			92.3			317.3	
Level of Service		F			F			F			F	
Approach Delay (s)		329.3			203.4			92.3			317.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	233.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	142.9%	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)	157	574	77	89	416	171	55	333	89	236	459	157
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.97			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1821			1787			1805			1792	
Flt Permitted		0.62			0.72			0.81			0.64	
Satd. Flow (perm)		1143			1303			1465			1158	
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)	171	624	84	97	452	186	60	362	97	257	499	171
RTOR Reduction (vph)	0	3	0	0	9	0	0	6	0	0	6	0
Lane Group Flow (vph)	0	876	0	0	726	0	0	513	0	0	921	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		63.0			63.0			65.0			65.0	
Effective Green, g (s)		63.0			63.0			65.0			65.0	
Actuated g/C Ratio		0.45			0.45			0.46			0.46	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		514			586			680			538	
v/s Ratio Prot												
v/s Ratio Perm		c0.77			0.56			0.35			c0.80	
v/c Ratio		1.70			1.24			0.75			1.71	
Uniform Delay, d1		38.5			38.5			30.9			37.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		325.4			121.7			4.8			328.3	
Delay (s)		363.9			160.2			35.7			365.8	
Level of Service		F			F			D			F	
Approach Delay (s)		363.9			160.2			35.7			365.8	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	259.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	154.6%	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)	157	416	55	89	574	236	77	459	89	171	333	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.95	
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)	1736	3471	1553	1736	3471	1553	1736	3386		1736	3304	
Flt Permitted	0.31	1.00	1.00	0.41	1.00	1.00	0.38	1.00		0.29	1.00	
Satd. Flow (perm)	566	3471	1553	747	3471	1553	698	3386		532	3304	
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)	171	452	60	97	624	257	84	499	97	186	362	171
RTOR Reduction (vph)	0	0	45	0	0	195	0	28	0	0	97	0
Lane Group Flow (vph)	171	452	15	97	624	62	84	568	0	186	436	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	13.8	10.9	10.9	13.8	10.9	10.9	14.8	12.6		16.2	13.3	
Effective Green, g (s)	17.8	12.9	12.9	17.8	12.9	12.9	18.8	14.6		20.2	15.3	
Actuated g/C Ratio	0.33	0.24	0.24	0.33	0.24	0.24	0.35	0.27		0.38	0.29	
Clearance Time (s)	6.0	6.0	6.0	6.0	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	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	297	840	376	340	840	376	328	927		312	948	
v/s Ratio Prot	c0.05	0.13		0.03	c0.18		0.02	0.17		c0.05	0.13	
v/s Ratio Perm	0.14		0.01	0.07		0.04	0.07			c0.17		
v/c Ratio	0.58	0.54	0.04	0.29	0.74	0.17	0.26	0.61		0.60	0.46	
Uniform Delay, d1	13.4	17.6	15.5	12.6	18.7	15.9	11.8	16.9		11.8	15.6	
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	2.7	0.7	0.0	0.5	3.6	0.2	0.4	1.2		3.0	0.4	
Delay (s)	16.1	18.3	15.5	13.0	22.2	16.2	12.2	18.1		14.9	16.0	
Level of Service	B	B	B	B	C	B	B	B		B	B	
Approach Delay (s)		17.5			19.7			17.4			15.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.9%	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)	157	574	77	89	416	171	55	333	89	236	459	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.96	
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)	1736	3471	1553	1736	3471	1553	1736	3361		1736	3338	
Flt Permitted	0.33	1.00	1.00	0.31	1.00	1.00	0.39	1.00		0.31	1.00	
Satd. Flow (perm)	602	3471	1553	566	3471	1553	717	3361		566	3338	
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)	171	624	84	97	452	186	60	362	97	257	499	171
RTOR Reduction (vph)	0	0	64	0	0	146	0	38	0	0	52	0
Lane Group Flow (vph)	171	624	20	97	452	40	60	421	0	257	618	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	16.9	12.4	12.4	13.9	10.9	10.9	15.5	13.2		26.5	18.7	
Effective Green, g (s)	20.9	14.4	14.4	17.9	12.9	12.9	19.5	15.2		29.0	20.7	
Actuated g/C Ratio	0.35	0.24	0.24	0.30	0.21	0.21	0.32	0.25		0.48	0.34	
Clearance Time (s)	6.0	6.0	6.0	6.0	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	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	330	828	370	265	741	332	304	846		462	1144	
v/s Ratio Prot	c0.06	c0.18		0.03	0.13		0.01	0.13		c0.09	0.19	
v/s Ratio Perm	0.12		0.01	0.08		0.03	0.05			c0.18		
v/c Ratio	0.52	0.75	0.05	0.37	0.61	0.12	0.20	0.50		0.56	0.54	
Uniform Delay, d1	14.6	21.4	17.7	16.0	21.5	19.2	14.3	19.3		10.2	16.0	
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	1.4	3.9	0.1	0.9	1.4	0.2	0.3	0.5		1.5	0.5	
Delay (s)	15.9	25.3	17.8	16.9	22.9	19.3	14.7	19.8		11.6	16.5	
Level of Service	B	C	B	B	C	B	B	B		B	B	
Approach Delay (s)		22.7			21.2			19.2			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	420	581	338	245	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	457	632	367	266	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	1905	274	283			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1905	274	283			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	40	51			
cM capacity (veh/h)	38	764	1280			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	473	999	283
Volume Left	16	632	0
Volume Right	457	0	16
cSH	462	1280	1700
Volume to Capacity	1.02	0.49	0.17
Queue Length 95th (ft)	350	71	0
Control Delay (s)	78.3	9.1	0.0
Lane LOS	F	A	
Approach Delay (s)	78.3	9.1	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	26.3		
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	581	420	245	338	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	632	457	266	367	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	1555	376	384			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1555	376	384			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	6	61			
cM capacity (veh/h)	76	671	1175			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	648	723	384
Volume Left	16	457	0
Volume Right	632	0	16
cSH	561	1175	1700
Volume to Capacity	1.16	0.39	0.23
Queue Length 95th (ft)	549	47	0
Control Delay (s)	114.1	8.0	0.0
Lane LOS	F	A	
Approach Delay (s)	114.1	8.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	45.4		
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	15	420	581	338	245	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.87			1.00	0.99	
Flt Protected	1.00			0.97	1.00	
Satd. Flow (prot)	1617			1806	1848	
Flt Permitted	1.00			0.65	1.00	
Satd. Flow (perm)	1617			1213	1848	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	457	632	367	266	16
RTOR Reduction (vph)	424	0	0	0	1	0
Lane Group Flow (vph)	49	0	0	999	281	0
Turn Type			Perm			
Protected Phases				2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	10.4			122.1	122.1	
Effective Green, g (s)	10.4			122.1	122.1	
Actuated g/C Ratio	0.07			0.84	0.84	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	116			1025	1562	
v/s Ratio Prot					0.15	
v/s Ratio Perm	c0.03			c0.82		
v/c Ratio	0.42			0.97	0.18	
Uniform Delay, d1	64.2			9.8	2.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.5			22.0	0.1	
Delay (s)	66.6			31.8	2.1	
Level of Service	E			C	A	
Approach Delay (s)	66.6			31.8	2.1	
Approach LOS	E			C	A	

Intersection Summary			
HCM Average Control Delay	36.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	144.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	15	581	420	245	338	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.87			1.00	0.99	
Flt Protected	1.00			0.97	1.00	
Satd. Flow (prot)	1615			1806	1852	
Flt Permitted	1.00			0.59	1.00	
Satd. Flow (perm)	1615			1107	1852	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	632	457	266	367	16
RTOR Reduction (vph)	465	0	0	0	2	0
Lane Group Flow (vph)	183	0	0	723	381	0
Turn Type			Perm			
Protected Phases				2	6	
Permitted Phases	4		2			
Actuated Green, G (s)	12.9			57.6	57.6	
Effective Green, g (s)	12.9			57.6	57.6	
Actuated g/C Ratio	0.16			0.70	0.70	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	253			773	1293	
v/s Ratio Prot					0.21	
v/s Ratio Perm	c0.11			c0.65		
v/c Ratio	0.72			0.94	0.29	
Uniform Delay, d1	33.1			10.8	4.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	9.8			18.3	0.1	
Delay (s)	42.9			29.2	4.9	
Level of Service	D			C	A	
Approach Delay (s)	42.9			29.2	4.9	
Approach LOS	D			C	A	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	15	420	581	338	245	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
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)	1736	1553	1736	3471	3442	
Flt Permitted	0.95	1.00	0.39	1.00	1.00	
Satd. Flow (perm)	1736	1553	705	3471	3442	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	457	632	367	266	16
RTOR Reduction (vph)	0	371	0	0	8	0
Lane Group Flow (vph)	16	86	632	367	274	0
Turn Type		Perm	pm+pt			
Protected Phases	7		5	2	6	
Permitted Phases	4	7	2			
Actuated Green, G (s)	6.9	6.9	28.5	28.5	6.0	
Effective Green, g (s)	8.9	8.9	30.5	30.5	8.0	
Actuated g/C Ratio	0.19	0.19	0.64	0.64	0.17	
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)	326	292	856	2233	581	
v/s Ratio Prot	0.01		c0.29	0.11	0.08	
v/s Ratio Perm		c0.06	c0.19			
v/c Ratio	0.05	0.29	0.74	0.16	0.47	
Uniform Delay, d1	15.8	16.5	5.2	3.4	17.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.6	3.4	0.0	0.6	
Delay (s)	15.8	17.1	8.5	3.4	18.4	
Level of Service	B	B	A	A	B	
Approach Delay (s)	17.1			6.6	18.4	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	15	581	420	245	338	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	0.91	0.91	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	0.98	1.00	
Satd. Flow (prot)	1736	1553	1579	3250	3449	
Flt Permitted	0.95	1.00	0.35	0.64	1.00	
Satd. Flow (perm)	1736	1553	579	2113	3449	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	632	457	266	367	16
RTOR Reduction (vph)	0	361	0	0	7	0
Lane Group Flow (vph)	16	271	228	495	376	0
Turn Type		Perm	pm+pt			
Protected Phases	7		5	2	6	
Permitted Phases	4	7	2			
Actuated Green, G (s)	9.1	9.1	14.9	14.9	5.9	
Effective Green, g (s)	11.1	11.1	16.9	16.9	7.9	
Actuated g/C Ratio	0.31	0.31	0.47	0.47	0.22	
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)	535	479	411	1150	757	
v/s Ratio Prot	0.01		c0.08	0.06	0.11	
v/s Ratio Perm		c0.17	c0.18	0.14		
v/c Ratio	0.03	0.57	0.55	0.43	0.50	
Uniform Delay, d1	8.7	10.4	6.2	6.3	12.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	1.5	1.6	0.3	0.5	
Delay (s)	8.7	12.0	7.8	6.6	12.8	
Level of Service	A	B	A	A	B	
Approach Delay (s)	11.9			7.0	12.8	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	36.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.5%	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)	32	171	222	38	236	20	306	281	38	15	203	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	186	241	41	257	22	333	305	41	16	221	35

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	462	320	679	272
Volume Left (vph)	35	41	333	16
Volume Right (vph)	241	22	41	35
Hadj (s)	-0.26	0.02	0.10	-0.03
Departure Headway (s)	8.0	8.7	8.3	9.0
Degree Utilization, x	1.03	0.78	1.58	0.68
Capacity (veh/h)	447	403	434	389
Control Delay (s)	77.6	36.2	291.3	28.7
Approach Delay (s)	77.6	36.2	291.3	28.7
Approach LOS	F	E	F	D

Intersection Summary			
Delay	146.1		
HCM Level of Service	F		
Intersection Capacity Utilization	86.2%	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)	32	236	306	38	171	15	222	203	38	20	281	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	257	333	41	186	16	241	221	41	22	305	35

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	624	243	503	362
Volume Left (vph)	35	41	241	22
Volume Right (vph)	333	16	41	35
Hadj (s)	-0.27	0.03	0.08	-0.01
Departure Headway (s)	8.0	9.2	8.4	8.6
Degree Utilization, x	1.39	0.62	1.17	0.86
Capacity (veh/h)	456	374	433	405
Control Delay (s)	212.6	26.4	127.3	46.1
Approach Delay (s)	212.6	26.4	127.3	46.1
Approach LOS	F	D	F	E

Intersection Summary			
Delay	126.9		
HCM Level of Service	F		
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	171	222	38	236	20	306	281	38	15	203	32
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.99			0.99			0.98	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		1725			1834			1803			1825	
Flt Permitted		0.95			0.83			0.73			0.95	
Satd. Flow (perm)		1647			1533			1344			1746	
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)	35	186	241	41	257	22	333	305	41	16	221	35
RTOR Reduction (vph)	0	53	0	0	4	0	0	3	0	0	7	0
Lane Group Flow (vph)	0	409	0	0	316	0	0	676	0	0	265	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.2			20.2			37.9			37.9	
Effective Green, g (s)		20.2			20.2			37.9			37.9	
Actuated g/C Ratio		0.29			0.29			0.54			0.54	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		475			442			727			944	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.21			c0.50			0.15	
v/c Ratio		0.86			0.72			0.93			0.28	
Uniform Delay, d1		23.6			22.4			14.9			8.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		14.8			5.5			18.1			0.2	
Delay (s)		38.4			27.8			33.0			8.9	
Level of Service		D			C			C			A	
Approach Delay (s)		38.4			27.8			33.0			8.9	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	70.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.2%	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)	32	236	306	38	171	15	222	203	38	20	281	32
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	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.99			0.99			0.99	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		1724			1831			1799			1833	
Flt Permitted		0.97			0.81			0.66			0.96	
Satd. Flow (perm)		1677			1500			1217			1759	
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)	35	257	333	41	186	16	241	221	41	22	305	35
RTOR Reduction (vph)	0	59	0	0	4	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	566	0	0	239	0	0	499	0	0	356	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.5			24.5			29.8			29.8	
Effective Green, g (s)		24.5			24.5			29.8			29.8	
Actuated g/C Ratio		0.37			0.37			0.45			0.45	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		620			554			547			791	
v/s Ratio Prot												
v/s Ratio Perm		c0.34			0.16			c0.41			0.20	
v/c Ratio		0.91			0.43			0.91			0.45	
Uniform Delay, d1		19.9			15.7			17.0			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		18.0			0.5			19.5			0.4	
Delay (s)		37.8			16.2			36.5			13.0	
Level of Service		D			B			D			B	
Approach Delay (s)		37.8			16.2			36.5			13.0	
Approach LOS		D			B			D			B	

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.1%	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)	32	171	222	38	236	20	306	281	38	15	203	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
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)	1736	3471	1553	1736	3471	1553	1736	3409		1736	3400	
Flt Permitted	0.59	1.00	1.00	0.63	1.00	1.00	0.41	1.00		0.54	1.00	
Satd. Flow (perm)	1083	3471	1553	1159	3471	1553	758	3409		994	3400	
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)	35	186	241	41	257	22	333	305	41	16	221	35
RTOR Reduction (vph)	0	0	202	0	0	18	0	19	0	0	26	0
Lane Group Flow (vph)	35	186	39	41	257	4	333	327	0	16	230	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	6.6	5.3	5.3	6.6	5.3	5.3	20.7	14.0		8.0	7.3	
Effective Green, g (s)	10.6	7.3	7.3	10.6	7.3	7.3	22.7	16.0		12.0	9.3	
Actuated g/C Ratio	0.23	0.16	0.16	0.23	0.16	0.16	0.50	0.35		0.26	0.21	
Clearance Time (s)	6.0	6.0	6.0	6.0	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	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	301	559	250	313	559	250	583	1204		308	698	
v/s Ratio Prot	0.01	0.05		c0.01	c0.07		c0.12	0.10		0.00	0.07	
v/s Ratio Perm	0.02		0.03	0.02		0.00	c0.17			0.01		
v/c Ratio	0.12	0.33	0.16	0.13	0.46	0.01	0.57	0.27		0.05	0.33	
Uniform Delay, d1	13.6	16.8	16.3	13.6	17.2	16.0	7.2	10.5		12.4	15.3	
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	0.2	0.4	0.3	0.2	0.6	0.0	1.4	0.1		0.1	0.3	
Delay (s)	13.7	17.2	16.6	13.8	17.8	16.0	8.6	10.6		12.4	15.6	
Level of Service	B	B	B	B	B	B	A	B		B	B	
Approach Delay (s)		16.6			17.2			9.6			15.4	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.8%	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 (vph)	32	236	306	38	171	15	222	203	38	20	281	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
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)	1736	3471	1553	1736	3471	1553	1736	3390		1736	3418	
Flt Permitted	0.63	1.00	1.00	0.59	1.00	1.00	0.42	1.00		0.59	1.00	
Satd. Flow (perm)	1159	3471	1553	1083	3471	1553	765	3390		1078	3418	
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)	35	257	333	41	186	16	241	221	41	22	305	35
RTOR Reduction (vph)	0	0	263	0	0	13	0	26	0	0	16	0
Lane Group Flow (vph)	35	257	70	41	186	3	241	236	0	22	324	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	9.5	8.2	8.2	9.5	8.2	8.2	19.1	14.6		11.3	10.7	
Effective Green, g (s)	13.5	10.2	10.2	13.5	10.2	10.2	23.1	16.6		15.3	12.7	
Actuated g/C Ratio	0.28	0.21	0.21	0.28	0.21	0.21	0.47	0.34		0.31	0.26	
Clearance Time (s)	6.0	6.0	6.0	6.0	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	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	360	727	325	344	727	325	492	1156		374	891	
v/s Ratio Prot	0.01	c0.07		c0.01	0.05		c0.07	0.07		0.00	0.09	
v/s Ratio Perm	0.02		0.04	0.02		0.00	c0.17			0.02		
v/c Ratio	0.10	0.35	0.21	0.12	0.26	0.01	0.49	0.20		0.06	0.36	
Uniform Delay, d1	13.0	16.4	15.9	13.0	16.1	15.3	8.0	11.4		11.6	14.7	
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	0.1	0.3	0.3	0.2	0.2	0.0	0.8	0.1		0.1	0.3	
Delay (s)	13.1	16.7	16.3	13.2	16.3	15.3	8.8	11.5		11.7	15.0	
Level of Service	B	B	B	B	B	B	A	B		B	B	
Approach Delay (s)		16.3			15.7			10.2			14.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	134	102	102	319	440	185
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	146	111	111	347	478	201
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	1147	579	679			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1147	579	679			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	25	78	88			
cM capacity (veh/h)	193	515	913			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	257	458	679
Volume Left	146	111	0
Volume Right	111	0	201
cSH	265	913	1700
Volume to Capacity	0.97	0.12	0.40
Queue Length 95th (ft)	233	10	0
Control Delay (s)	88.9	3.4	0.0
Lane LOS	F	A	
Approach Delay (s)	88.9	3.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	17.5		
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	185	102	102	440	319	134
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	111	111	478	347	146
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	1120	420	492			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1120	420	492			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	2	83	90			
cM capacity (veh/h)	205	634	1071			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	312	589	492
Volume Left	201	111	0
Volume Right	111	0	146
cSH	270	1071	1700
Volume to Capacity	1.16	0.10	0.29
Queue Length 95th (ft)	344	9	0
Control Delay (s)	143.9	2.7	0.0
Lane LOS	F	A	
Approach Delay (s)	143.9	2.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	33.4		
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	89	376	1109	65	376	1531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	4.0	6.0
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)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.13	1.00
Satd. Flow (perm)	1770	1583	3539	1583	246	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	409	1205	71	409	1664
RTOR Reduction (vph)	0	338	0	43	0	0
Lane Group Flow (vph)	97	71	1205	28	409	1664
Turn Type		Perm		Perm	pm+pt	
Protected Phases	2		4		3	8
Permitted Phases		2		4	8	
Actuated Green, G (s)	9.9	9.9	26.3	26.3	44.2	44.2
Effective Green, g (s)	9.9	9.9	26.3	26.3	44.2	44.2
Actuated g/C Ratio	0.15	0.15	0.40	0.40	0.67	0.67
Clearance Time (s)	6.0	6.0	6.0	6.0	4.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	265	237	1408	630	485	2366
v/s Ratio Prot	c0.05		0.34		c0.18	0.47
v/s Ratio Perm		0.05		0.02	c0.39	
v/c Ratio	0.37	0.30	0.86	0.04	0.84	0.70
Uniform Delay, d1	25.3	25.0	18.2	12.2	15.7	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.7	5.3	0.0	12.6	1.0
Delay (s)	26.1	25.7	23.5	12.2	28.3	7.8
Level of Service	C	C	C	B	C	A
Approach Delay (s)	25.8		22.9			11.9
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	65	376	1531	89	376	1109
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	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)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.08	1.00
Satd. Flow (perm)	1770	1583	3539	1583	155	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	409	1664	97	409	1205
RTOR Reduction (vph)	0	267	0	39	0	0
Lane Group Flow (vph)	71	142	1664	58	409	1205
Turn Type		Perm		Perm	pm+pt	
Protected Phases	2		4		3	8
Permitted Phases		2		4	8	
Actuated Green, G (s)	11.3	11.3	42.1	42.1	64.1	64.1
Effective Green, g (s)	11.3	11.3	42.1	42.1	64.1	64.1
Actuated g/C Ratio	0.13	0.13	0.48	0.48	0.73	0.73
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)	229	205	1705	763	409	2596
v/s Ratio Prot	0.04		0.47		c0.18	0.34
v/s Ratio Perm		c0.09		0.04	c0.55	
v/c Ratio	0.31	0.69	0.98	0.08	1.00	0.46
Uniform Delay, d1	34.5	36.4	22.2	12.2	28.6	4.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	9.6	16.3	0.0	44.5	0.1
Delay (s)	35.3	46.0	38.4	12.2	73.1	4.8
Level of Service	D	D	D	B	E	A
Approach Delay (s)	44.4		37.0			22.1
Approach LOS	D		D			C

Intersection Summary			
HCM Average Control Delay	31.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.8%	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)	249	416	176	32	574	51	242	102	32	37	74	249
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	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.99			0.99			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	1780		1770	1840			1784			1680	
Flt Permitted	0.10	1.00		0.16	1.00			0.50			0.93	
Satd. Flow (perm)	177	1780		290	1840			924			1568	
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)	271	452	191	35	624	55	263	111	35	40	80	271
RTOR Reduction (vph)	0	14	0	0	3	0	0	3	0	0	74	0
Lane Group Flow (vph)	271	629	0	35	676	0	0	406	0	0	317	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	54.0	44.0		40.0	36.0			44.0			44.0	
Effective Green, g (s)	54.0	44.0		40.0	36.0			44.0			44.0	
Actuated g/C Ratio	0.49	0.40		0.36	0.33			0.40			0.40	
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)	261	712		159	602			370			627	
v/s Ratio Prot	c0.11	0.35		0.01	c0.37							
v/s Ratio Perm	0.40			0.07				c0.44			0.20	
v/c Ratio	1.04	0.88		0.22	1.12			1.10			0.51	
Uniform Delay, d1	32.4	30.6		25.2	37.0			33.0			24.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	66.0	12.5		0.7	75.6			75.6			0.6	
Delay (s)	98.4	43.2		25.9	112.6			108.6			25.5	
Level of Service	F	D		C	F			F			C	
Approach Delay (s)		59.5			108.3			108.6			25.5	
Approach LOS		E			F			F			C	

Intersection Summary			
HCM Average Control Delay	76.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	109.1%	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)	249	574	242	32	416	37	176	74	32	51	102	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.99			0.98			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	1780		1770	1840			1778			1696	
Flt Permitted	0.23	1.00		0.07	1.00			0.45			0.92	
Satd. Flow (perm)	433	1780		135	1840			819			1566	
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)	271	624	263	35	452	40	191	80	35	55	111	271
RTOR Reduction (vph)	0	11	0	0	2	0	0	3	0	0	42	0
Lane Group Flow (vph)	271	876	0	35	490	0	0	303	0	0	395	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	76.8	68.0		59.6	55.3			51.2			51.2	
Effective Green, g (s)	76.8	68.0		59.6	55.3			51.2			51.2	
Actuated g/C Ratio	0.55	0.49		0.43	0.39			0.37			0.37	
Clearance Time (s)	6.0	6.0		4.5	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)	386	865		108	727			300			573	
v/s Ratio Prot	c0.08	c0.49		0.01	0.27							
v/s Ratio Perm	0.31			0.13				c0.37			0.25	
v/c Ratio	0.70	1.01		0.32	0.67			1.01			0.69	
Uniform Delay, d1	22.0	36.0		33.1	34.9			44.4			37.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	5.7	33.8		1.7	2.5			54.4			3.5	
Delay (s)	27.7	69.8		34.9	37.4			98.8			41.1	
Level of Service	C	E		C	D			F			D	
Approach Delay (s)		60.0			37.2			98.8			41.1	
Approach LOS		E			D			F			D	

Intersection Summary			
HCM Average Control Delay	56.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	96	32	2137	96	23	1548
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	35	2323	104	25	1683
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3266	1214			2427	
vC1, stage 1 conf vol	2375					
vC2, stage 2 conf vol	891					
vCu, unblocked vol	3266	1214			2427	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	80			87	
cM capacity (veh/h)	53	174			192	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	139	1549	879	25	841	841
Volume Left	104	0	0	25	0	0
Volume Right	35	0	104	0	0	0
cSH	65	1700	1700	192	1700	1700
Volume to Capacity	2.15	0.91	0.52	0.13	0.49	0.49
Queue Length 95th (ft)	331	0	0	11	0	0
Control Delay (s)	667.7	0.0	0.0	26.6	0.0	0.0
Lane LOS	F			D		
Approach Delay (s)	667.7	0.0		0.4		
Approach LOS	F					

Intersection Summary			
Average Delay	21.9		
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	96	23	1548	96	32	2137
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	25	1683	104	35	2323
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2966	893			1787	
vC1, stage 1 conf vol	1735					
vC2, stage 2 conf vol	1231					
vCu, unblocked vol	2966	893			1787	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	91			90	
cM capacity (veh/h)	105	284			343	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	129	1122	665	35	1161	1161
Volume Left	104	0	0	35	0	0
Volume Right	25	0	104	0	0	0
cSH	119	1700	1700	343	1700	1700
Volume to Capacity	1.09	0.66	0.39	0.10	0.68	0.68
Queue Length 95th (ft)	191	0	0	8	0	0
Control Delay (s)	177.7	0.0	0.0	16.7	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	177.7	0.0		0.2		
Approach LOS	F					

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection: 1: US 98 & GCP

Movement	SE	SE	SE	NW	NW	NW	SW	SW	SW
Directions Served	L	T	T	T	TR	R	L	L	R
Maximum Queue (ft)	177	49	79	124	160	143	304	316	74
Average Queue (ft)	77	22	29	52	95	63	127	150	37
95th Queue (ft)	145	45	58	98	140	98	227	246	62
Link Distance (ft)		2152	2152	2155	2155			1798	1798
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	500					500	500		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: US 98 & GCP

Movement	SE	SE	SE	NW	NW	NW	SW	SW	SW
Directions Served	L	T	T	T	TR	R	L	L	R
Maximum Queue (ft)	177	52	79	74	138	125	248	278	68
Average Queue (ft)	91	29	37	34	80	59	147	165	30
95th Queue (ft)	148	52	64	71	126	94	229	242	51
Link Distance (ft)		2152	2152	2155	2155			1798	1798
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	500					500	500		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Network Summary

Network wide Queuing Penalty: 0

Intersection: 2: CR 386 & GCP

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	LT	T	T	TR	L	R
Maximum Queue (ft)	110	138	94	70	100	28	184
Average Queue (ft)	62	82	38	32	43	8	79
95th Queue (ft)	93	116	76	65	80	28	138
Link Distance (ft)		1534	1534	1498	1498		1696
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	500					500	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

Intersection: 2: CR 386 & GCP

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	LT	T	T	TR	L	R
Maximum Queue (ft)	116	138	160	53	97	53	159
Average Queue (ft)	62	92	53	23	30	14	71
95th Queue (ft)	109	132	111	52	67	41	121
Link Distance (ft)		1534	1534	1498	1498	1696	1696
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	500						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

Intersection: 3: GCP & SR 22_Type 3 Intersection

Movement	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	TR	L	L	T	T	R	L	T	T	R
Maximum Queue (ft)	53	482	504	191	189	195	212	148	72	140	162	179
Average Queue (ft)	27	273	298	82	94	116	131	70	20	88	96	93
95th Queue (ft)	58	449	482	138	147	183	204	114	55	131	154	151
Link Distance (ft)		1516	1516			1480	1480			1744	1744	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Intersection: 3: GCP & SR 22_Type 3 Intersection

Movement	SB	SB	SB	SB
Directions Served	L	L	T	TR
Maximum Queue (ft)	206	217	64	86
Average Queue (ft)	97	112	23	47
95th Queue (ft)	176	192	50	74
Link Distance (ft)			1095	1095
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	500		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 3: GCP & SR 22_Type 3 Intersection

Movement	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	TR	L	L	T	T	R	L	T	T	R
Maximum Queue (ft)	70	424	440	215	195	173	207	102	53	203	201	290
Average Queue (ft)	26	264	274	115	119	78	111	45	8	77	86	132
95th Queue (ft)	57	417	444	179	180	143	178	83	28	146	157	227
Link Distance (ft)		1515	1515			1480	1480			1744	1744	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 3: GCP & SR 22_Type 3 Intersection

Movement	SB	SB	SB	SB
Directions Served	L	L	T	TR
Maximum Queue (ft)	333	373	147	150
Average Queue (ft)	184	195	49	76
95th Queue (ft)	305	311	100	130
Link Distance (ft)			1700	1700
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	500		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 22 East & GCP_Type 4 Intersection

Movement	EB	EB	EB	WB	WB	NB	NB	NB
Directions Served	T	TR	R	LT	T	L	L	R
Maximum Queue (ft)	74	117	55	157	159	157	152	20
Average Queue (ft)	33	57	38	62	63	85	89	8
95th Queue (ft)	64	88	54	101	103	138	130	20
Link Distance (ft)	1515	1515		1504	1504		1743	1743
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500			500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 22 East & GCP_Type 4 Intersection

Movement	EB	EB	EB	WB	WB	NB	NB	NB
Directions Served	T	TR	R	LT	T	L	L	R
Maximum Queue (ft)	91	98	77	94	94	110	109	36
Average Queue (ft)	38	64	43	46	50	57	73	9
95th Queue (ft)	71	98	67	82	77	94	103	25
Link Distance (ft)	1515	1515		1504	1504		1743	1743
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500			500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 5: SR 22 West & GCP_Type 5 Intersection

Movement	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	LT	T	T	T	R	L	L	R
Maximum Queue (ft)	140	160	140	162	114	221	196	63
Average Queue (ft)	85	85	78	95	60	104	116	13
95th Queue (ft)	136	135	128	144	88	166	172	39
Link Distance (ft)	1527	1527	1493	1493			1523	1523
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)					600	500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 5: SR 22 West & GCP_Type 5 Intersection

Movement	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	LT	T	T	T	R	L	L	R
Maximum Queue (ft)	220	202	187	176	100	347	348	44
Average Queue (ft)	117	124	74	90	61	154	163	12
95th Queue (ft)	175	181	131	143	82	269	279	30
Link Distance (ft)	1527	1527	1493	1493			1523	1523
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)					500	500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 6: GCP Seg. K & GCP Seg.F_Type 6 Intersection

Movement	EB	EB	NB	NB	NB	NB	SB	SB
Directions Served	LR	R	L	L	T	T	T	TR
Maximum Queue (ft)	142	146	145	140	74	98	53	138
Average Queue (ft)	83	63	83	99	25	49	25	64
95th Queue (ft)	128	104	118	131	61	85	50	103
Link Distance (ft)	1516	1516			992	992	709	709
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500	500				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 6: GCP Seg. K & GCP Seg.F_Type 6 Intersection

Movement	EB	EB	NB	NB	NB	NB	SB	SB
Directions Served	LR	R	L	L	T	T	T	TR
Maximum Queue (ft)	211	197	111	135	71	98	138	156
Average Queue (ft)	96	80	70	84	18	48	45	75
95th Queue (ft)	158	130	106	127	49	85	90	122
Link Distance (ft)	1516	1516			992	992	709	709
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500	500				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Intersection: 7: GCP & Star Ave._Type 7 Intersection

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	92	120	140	49	100	245	228	78	136	169	190	170
Average Queue (ft)	48	58	78	26	51	91	111	40	68	70	99	52
95th Queue (ft)	81	101	127	43	94	173	180	63	120	141	171	104
Link Distance (ft)		681	681			681	681			630	630	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 7: GCP & Star Ave._Type 7 Intersection

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	110	174
Average Queue (ft)	45	72
95th Queue (ft)	84	130
Link Distance (ft)	678	678
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 7: GCP & Star Ave._Type 7 Intersection

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	115	268	268	52	136	95	115	68	135	108	152	151
Average Queue (ft)	46	98	119	33	64	63	76	28	44	44	81	60
95th Queue (ft)	88	183	206	49	116	93	110	55	85	85	131	113
Link Distance (ft)		681	681			681	681			630	630	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 7: GCP & Star Ave._Type 7 Intersection

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	111	131
Average Queue (ft)	47	73
95th Queue (ft)	87	116
Link Distance (ft)	678	678
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 8: GCP & Star Ave._Type 8 Intersection

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	118	136	139	49	74	204	197	112	96	198	170	302
Average Queue (ft)	61	63	77	21	35	111	123	46	38	95	95	92
95th Queue (ft)	93	104	110	46	69	173	180	79	71	154	147	213
Link Distance (ft)		681	681			681	681			630	630	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 8: GCP & Star Ave._Type 8 Intersection

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	151	186
Average Queue (ft)	59	99
95th Queue (ft)	119	160
Link Distance (ft)	678	678
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 8: GCP & Star Ave._Type 8 Intersection

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	160	199	206	65	162	164	142	139	126	133	232	216
Average Queue (ft)	86	97	119	22	61	79	94	35	33	61	88	94
95th Queue (ft)	139	166	189	52	118	134	141	75	74	110	151	181
Link Distance (ft)		681	681			681	681			630	630	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 8: GCP & Star Ave._Type 8 Intersection

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	212	193
Average Queue (ft)	66	104
95th Queue (ft)	140	169
Link Distance (ft)	678	678
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 10: GCP & Star Ave._Type 10 Intersection

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	48	138	183	52	74	93	112
Average Queue (ft)	11	76	119	10	34	49	60
95th Queue (ft)	35	125	179	37	66	85	95
Link Distance (ft)	682	682		654	654	690	690
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			500				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

Intersection: 10: GCP & Star Ave._Type 10 Intersection

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	27	247	270	53	72	133	136
Average Queue (ft)	7	129	138	21	42	75	74
95th Queue (ft)	25	225	218	47	77	116	112
Link Distance (ft)	682	682		654	654	690	690
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			500				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 0

Intersection: 11: GCP & Star Ave._Type 11 Intersection

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	52	52	71	91	72	76	120	77	223	50	65	67
Average Queue (ft)	22	21	40	43	21	32	54	15	94	22	36	9
95th Queue (ft)	46	49	67	74	47	64	90	42	169	47	62	33
Link Distance (ft)		681	681			681	681			630	630	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 11: GCP & Star Ave._Type 11 Intersection

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	70	84
Average Queue (ft)	32	43
95th Queue (ft)	65	71
Link Distance (ft)	678	678
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 11: GCP & Star Ave._Type 11 Intersection

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	52	71	95	78	74	74	97	45	131	84	79	48
Average Queue (ft)	17	31	50	45	19	26	37	16	66	19	34	10
95th Queue (ft)	42	53	78	72	47	56	74	37	103	56	65	31
Link Distance (ft)		681	681			681	681			630	630	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			500	500			500	500			500
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 11: GCP & Star Ave._Type 11 Intersection

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	111	134
Average Queue (ft)	45	67
95th Queue (ft)	86	109
Link Distance (ft)	678	678
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

APPENDIX G
UPDATED INTERSECTION INFORMATION

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	244	1521	1737	273	240	244
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	1.00	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)	1736	3471	3471	1553	3367	1553
Flt Permitted	0.07	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	133	3471	3471	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	265	1653	1888	297	261	265
RTOR Reduction (vph)	0	0	0	130	0	196
Lane Group Flow (vph)	265	1653	1888	167	261	69
Turn Type	pm+pt			Perm		Perm
Protected Phases	1	6	2		4	
Permitted Phases	6			2		4
Actuated Green, G (s)	66.4	66.4	49.0	49.0	10.5	10.5
Effective Green, g (s)	66.4	66.4	49.0	49.0	10.5	10.5
Actuated g/C Ratio	0.75	0.75	0.55	0.55	0.12	0.12
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)	305	2593	1913	856	398	183
v/s Ratio Prot	c0.11	0.48	c0.54		c0.08	
v/s Ratio Perm	0.54			0.11		0.04
v/c Ratio	0.87	0.64	0.99	0.20	0.66	0.38
Uniform Delay, d1	28.4	5.4	19.6	10.0	37.5	36.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.1	0.5	17.4	0.1	3.9	1.3
Delay (s)	50.5	6.0	37.0	10.1	41.3	37.5
Level of Service	D	A	D	B	D	D
Approach Delay (s)		12.1	33.4		39.4	
Approach LOS		B	C		D	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	88.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: US 98 & GCP

Movement	SE	SE	SE	NW	NW	NW	SW	SW	SW
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (ft)	286	190	207	520	555	101	145	138	174
Average Queue (ft)	180	107	134	328	374	47	83	86	103
95th Queue (ft)	330	182	208	509	568	93	153	145	176
Link Distance (ft)	2186	2186	2186	2148	2148	2148			1537
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							500	500	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Network Summary

Network wide Queuing Penalty: 0

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	244	1737	1521	240	273	244
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	1.00	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)	1736	3471	3471	1553	3367	1553
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	163	3471	3471	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	265	1888	1653	261	297	265
RTOR Reduction (vph)	0	0	0	124	0	190
Lane Group Flow (vph)	265	1888	1653	137	297	75
Turn Type	pm+pt			Perm		Perm
Protected Phases	1	6	2		4	
Permitted Phases	6			2		4
Actuated Green, G (s)	53.8	53.8	38.8	38.8	8.0	8.0
Effective Green, g (s)	53.8	53.8	38.8	38.8	8.0	8.0
Actuated g/C Ratio	0.73	0.73	0.53	0.53	0.11	0.11
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)	311	2530	1825	816	365	168
v/s Ratio Prot	0.10	c0.54	0.48		c0.09	
v/s Ratio Perm	c0.52			0.09		0.05
v/c Ratio	0.85	0.75	0.91	0.17	0.81	0.45
Uniform Delay, d1	20.4	5.9	15.8	9.1	32.2	30.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.6	1.2	6.9	0.1	13.0	1.9
Delay (s)	40.0	7.2	22.7	9.2	45.2	32.7
Level of Service	D	A	C	A	D	C
Approach Delay (s)		11.2	20.9		39.3	
Approach LOS		B	C		D	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: US 98 & GCP

Movement	SE	SE	SE	NW	NW	NW	SW	SW	SW
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (ft)	247	205	219	291	331	94	170	172	166
Average Queue (ft)	138	110	141	199	239	49	107	110	90
95th Queue (ft)	244	196	225	307	346	90	200	191	152
Link Distance (ft)	2186	2186	2186	2148	2148	2148			1537
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							500	500	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Network Summary

Network wide Queuing Penalty: 0

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.:
Date performed: 10/11/2012
Analysis time period: AM Peak
Freeway/Dir of Travel: NB US 98
Junction: US 98 GCP
Jurisdiction:
Analysis Year: 2035
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2120	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	336	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	294	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2120		336		294		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	589		93		82		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2356	373	327	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2356	4500	No
$v_{FO} = v_F - v_R$	1983	4500	No
v_R	373	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2356 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2356	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 20.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.462

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 49.0 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:
Agency/Co.:
Date performed: 10/11/2012
Analysis time period: AM Peak
Freeway/Dir of Travel: US 98 NB
Junction: US 98 GCP
Jurisdiction:
Analysis Year: 2035
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2120	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	294	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	336	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2120	294	336	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	589	82	93	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2356	327	373	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2683	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2356 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2683	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 24.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.357	
Space mean speed in ramp influence area,	S_R = 50.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 50.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.:
Date performed: 10/11/2012
Analysis time period: AM Peak
Freeway/Dir of Travel: US 98 SB
Junction: US 98 GCP
Jurisdiction:
Analysis Year: 2035
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1858	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	294	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	294	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1858		294		294		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	516		82		82		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2064	327	327	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2064 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2064	4500	No
$v_{FO} = v_F - v_R$	1737	4500	No
v_R	327	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2064 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2064	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	
Agency/Co.:	
Date performed:	10/11/2012
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 98 SB
Junction:	US 98 GCP
Jurisdiction:	
Analysis Year:	2038
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1858	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	294	vph
Length of first accel/decel lane	725	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	294	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1858	294	294	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	516	82	82	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2064	327	327	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2064 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2391	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2064 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2391	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.313	
Space mean speed in ramp influence area,	S_R = 50.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 50.9	mph

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	294	2120	1858	294	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0		
Lane Util. Factor	1.00	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1736	3471	3471	1553		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1736	3471	3471	1553		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	2304	2020	320	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	320	2304	2020	320	0	0
Turn Type	Prot			Free		
Protected Phases	1	6	2			
Permitted Phases				Free		
Actuated Green, G (s)	14.5	68.6	44.1	68.6		
Effective Green, g (s)	14.5	68.6	44.1	68.6		
Actuated g/C Ratio	0.21	1.00	0.64	1.00		
Clearance Time (s)	4.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	367	3471	2231	1553		
v/s Ratio Prot	c0.18	0.66	c0.58			
v/s Ratio Perm				0.21		
v/c Ratio	0.87	0.66	0.91	0.21		
Uniform Delay, d1	26.2	0.0	10.5	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	19.7	0.5	5.7	0.3		
Delay (s)	45.9	0.5	16.2	0.3		
Level of Service	D	A	B	A		
Approach Delay (s)		6.0	14.0		0.0	
Approach LOS		A	B		A	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	294	1858	2120	336	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0		
Lane Util. Factor	1.00	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1736	3471	3471	1553		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1736	3471	3471	1553		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	2020	2304	365	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	320	2020	2304	365	0	0
Turn Type	Prot			Free		
Protected Phases	1	6	2			
Permitted Phases				Free		
Actuated Green, G (s)	19.3	88.8	59.5	88.8		
Effective Green, g (s)	19.3	88.8	59.5	88.8		
Actuated g/C Ratio	0.22	1.00	0.67	1.00		
Clearance Time (s)	4.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0	3.0			
Lane Grp Cap (vph)	377	3471	2326	1553		
v/s Ratio Prot	c0.18	0.58	c0.66			
v/s Ratio Perm				0.24		
v/c Ratio	0.85	0.58	0.99	0.24		
Uniform Delay, d1	33.3	0.0	14.4	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	16.1	0.3	16.4	0.4		
Delay (s)	49.5	0.3	30.8	0.4		
Level of Service	D	A	C	A		
Approach Delay (s)		7.0	26.6		0.0	
Approach LOS		A	C		A	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	0	1858	2120	336	294	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0	6.0
Lane Util. Factor		0.95	0.95	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3471	3471	1553	3367	1553
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3471	3471	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2020	2304	365	320	320
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	0	2020	2304	365	320	315
Turn Type				Free		Perm
Protected Phases		6	2		4	
Permitted Phases				Free		4
Actuated Green, G (s)		56.0	56.0	88.5	20.5	20.5
Effective Green, g (s)		56.0	56.0	88.5	20.5	20.5
Actuated g/C Ratio		0.63	0.63	1.00	0.23	0.23
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2196	2196	1553	780	360
v/s Ratio Prot		0.58	c0.66		0.10	
v/s Ratio Perm				0.24		c0.20
v/c Ratio		0.92	1.05	0.24	0.41	0.87
Uniform Delay, d1		14.3	16.2	0.0	28.9	32.8
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.8	33.6	0.4	0.4	20.2
Delay (s)		21.1	49.9	0.4	29.2	53.0
Level of Service		C	D	A	C	D
Approach Delay (s)		21.1	43.1		41.1	
Approach LOS		C	D		D	

Intersection Summary			
HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	0	2120	1858	294	336	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0	6.0
Lane Util. Factor		0.95	0.95	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3471	3471	1553	3367	1553
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3471	3471	1553	3367	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2304	2020	320	365	320
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	0	2304	2020	320	365	310
Turn Type				Free		Perm
Protected Phases		6	2		4	
Permitted Phases				Free		4
Actuated Green, G (s)		56.1	56.1	88.4	20.3	20.3
Effective Green, g (s)		56.1	56.1	88.4	20.3	20.3
Actuated g/C Ratio		0.63	0.63	1.00	0.23	0.23
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2203	2203	1553	773	357
v/s Ratio Prot		c0.66	0.58		0.11	
v/s Ratio Perm				0.21		c0.20
v/c Ratio		1.05	0.92	0.21	0.47	0.87
Uniform Delay, d1		16.2	14.1	0.0	29.4	32.8
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		32.5	6.6	0.3	0.5	19.4
Delay (s)		48.6	20.7	0.3	29.9	52.2
Level of Service		D	C	A	C	D
Approach Delay (s)		48.6	17.9		40.3	
Approach LOS		D	B		D	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.:
Date performed: 10/11/2012
Analysis time period: PM Peak
Freeway/Dir of Travel: NB US 98
Junction: US 98 GCP
Jurisdiction:
Analysis Year: 2035
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1858	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	294	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	294	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1858		294		294		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	516		82		82		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2064	327	327	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2064 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2064	4500	No
$v_{FO} = v_F - v_R$	1737	4500	No
v_R	327	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2064 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2064	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 18.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:
Agency/Co.:
Date performed: 10/11/2012
Analysis time period: PM Peak
Freeway/Dir of Travel: US 98 NB
Junction: US 98 GCP
Jurisdiction:
Analysis Year: 2035
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1858	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	294	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	294	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1858	294	294	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	516	82	82	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2064	327	327	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2064 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2391	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2064 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2391	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.343	
Space mean speed in ramp influence area,	S_R = 50.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 50.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:
Agency/Co.:
Date performed: 10/11/2012
Analysis time period: PM Peak
Freeway/Dir of Travel: US 98
Junction: US 98 GCP
Jurisdiction:
Analysis Year: 2035
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2120	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	294	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	336	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2120		294		336		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	589		82		93		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2356	327	373	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2356	4500	No
$v_{FO} = v_F - v_R$	2029	4500	No
v_R	327	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2356 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2356	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	
Agency/Co.:	
Date performed:	10/11/2012
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 98 SB
Junction:	US 98 GCP
Jurisdiction:	
Analysis Year:	2038
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2120	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	336	vph
Length of first accel/decel lane	725	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	294	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2120	336	294	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	589	93	82	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2356	373	327	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2729	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2356 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2729	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.330

Space mean speed in ramp influence area, S_R = 50.7 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 50.7 mph