District Department of Transportation

appendix A

anacostia river navigation evaluation final report

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submitted by:

PARSONS BRINCKERHOFF

District Department of Transportation

South Capitol Street Corridor Project
Frederick Douglass Memorial Bridge Replacement

Anacostia River Navigation Evaluation Final Report

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Prepared By:

PARSONS BRINCKERHOFF

District Department of Transportation

Department of Transportation United States of America

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Executive Summary

Anacostia River Navigation Evaluation

As a part of the Anacostia Waterfront Initiative, which pledges to restore and revitalize the Anacostia River and surrounding neighborhoods, the District of Columbia is preparing to replace the Frederick Douglass Memorial Bridge (FDMB) and upgrade the South Capitol Street corridor. The existing bridge is a moveable span bridge. Built in 1949, the existing bridge has been rehabilitated as an interim solution to address the immediate structural deficiencies; however, replacement of the bridge is necessary to address long-term structural needs and safety issues. By transitioning from a moveable span bridge to a fixed bridge, the District would save an additional $100,000 per year on operations and maintenance required for a drawbridge. Additionally, the fixed-span bridge design reduces cost of reconstruction by an estimated $140 million.

Replacement of the 63-year-old bridge supports economic development, improves multi-modal transportation options, optimizes community accessibility, and increases pedestrian and vehicular safety. Additionally, new drainage and storm water management will provide further opportunities for sustainable development. Parsons Brinckerhoff was retained to perform a Navigation Channel Evaluation to support a US Coast Guard Section 9 Bridge Permit Application for the replacement bridge.

The Frederick Douglass Memorial Bridge is located at the southeast quadrant of the District of Columbia and immediately northeast of the confluence of the Potomac and Anacostia Rivers. The Washington US Navy Yard is directly upstream from the existing bridge. The ballpark for the Washington Nationals Major League Baseball team is directly north of the bridge. South of the bridge is the Joint Base Anacostia-Bolling, and east of the bridge is Poplar Point. Constructed in 1949, and dedicated to Frederick Douglass in October 1964, the existing bridge carries South Capitol Street over the Anacostia River.

An initial ("Phase 1") Navigation Evaluation was conducted and the results and conclusions summarized in a report entitled *Anacostia River Navigation Evaluation*, dated September 20, 2013. This report summarized the existing vessel population, clearances of other bridge structures on the Anacostia and

Potomac Rivers, environmental and land use considerations affecting future vessel traffic, projected future vessel populations, impacts of the proposed replacement bridge on future vessel traffic and existing infrastructure, and recommended design build contract provisions for vessel impact protection design.

Under Phase 1 of the Navigation Evaluation Report, the current vessel population was documented from surveys of river users and review of bridge opening logs for the existing bridge. Phase 2 of the study consisted of collection of actual vessel transit volume from July 7, 2013 until October 6, 2013 using an EarthCam video camera. The existing vessel population developed as part of the Phase 1 study has been revised based on the additional monitoring data. Future vessel traffic was projected based on research of environmental and land use considerations and future plans of existing users and property owners along the river. This report summarizes the results of the Phase 1 evaluation, the additional data collected under Phase 2, and the effect of the additional data on the conclusions drawn from Phase 1. Final recommendations for the replacement structure are presented, considering the data gathered in both phases.

The resulting vessel population overwhelmingly consists of recreational vessels, comprising approximately 90 percent of the transits under the bridge documented during the Phase 2 data collection period. The proposed 42-foot vertical clearance and 150-foot horizontal clearance for the replacement bridge is expected to accommodate 99.9 percent of the existing and projected vessel traffic on the waterway. During Phase 1, the following vessels/operations were identified as those which might be adversely affected by the proposed clearance:

- A US Coast Guard buoy tender whose mission may be discontinued
- US Coast Guard patrol vessels with a most recent documented transit in 2005
- Three sailing ships, each with one recorded round-trip transit, most recently in 2012
- One tug with a last recorded transit in 2004
- A Merchant Marine training ship with one documented transit in 2003
- The *Cherry Blossom* vessel operated by Potomac River Company
- A future one-time transit of the Display Ship (DS) *Barry* from the US Navy Yard for disposal
- A future one-time transit of a replacement display ship to the US Navy Yard, and
- The sailing vessel *American Spirit* with one documented transit in 2006.

The *American Spirit* and *Cherry Blossom* were previously estimated to collectively account for 73 annual vessel transits. However, it has been verified that this is not the case. The *Cherry Blossom* has been removed from the existing vessel population and average annual transits associated with the *American Spirit* have been reduced from 48 to 0.1.

Impacts to projected future vessel traffic are expected to be minimal with the construction of a fixed Frederick Douglass Memorial Bridge (FDMB). While recreational and passenger vessel traffic is projected to increase, the vessel sizes expected will be accommodated by the proposed 42-foot vertical clearance. Based on the new data gathered in the Phase 2 evaluation, the number of average annual bridge transits potentially impacted by a fixed bridge with a 42-foot vertical clearance has been reduced

from 77, reported under the Phase 1 evaluation, to 4.1. Three of these transits are attributable to US Coast Guard patrol craft and the buoy tender *James Rankin*, none of which has been recorded transiting the bridge since 2005. The remaining potentially impacted vessels are included in the vessel population by virtue of their appearance in the bridge opening logs for one round-trip transit in the 12-year period covered by the logs. Plans for future transits are unknown.

In addition to the above, installation of a fixed bridge may impact infrequent tall-ship visits to the US Navy Yard, replacement of the *DS Barry* at the US Navy Yard, and Earth Conservation Corps' planned installation of a replica of the schooner *Pearl*. If the *DS Barry* is removed after FDMB construction, its superstructure will have to be removed while at dock at the US Navy Yard to allow transit under the bridge. Installation of a similar size display vessel at the US Navy Yard will need to be coordinated and accomplished with the US Navy prior to the construction of the FDMB.

The intended use of the replica *Pearl* is not clear. If it is intended as a display ship, conceivably, it could be transported to the site with its masts removed and reinstalled in-situ.

The location of the proposed replacement bridge was evaluated for effects on existing maritime infrastructure. Construction of the new bridge will result in demolition of a pier structure on the west bank of the Anacostia south of the bridge, but this structure is not currently in use. The position of the new bridge may result in some expense to revise the existing pier used by the bunkering company, Vane Line Bunkering, Inc., which delivers fuel for Andrews Air Force Base; and those costs would become a South Capitol Street project cost. These infrastructure impacts will occur for any bridge on the proposed alignment, whether fixed or movable.

As the existing bridge has a charted horizontal clearance of 149 feet, it is recommended that the existing clearance be maintained, and the current design accommodates that easily. This horizontal clearance would have no impact on projected vessel traffic.

The additional data obtained in Phase 2 of the evaluation has resulted in a reduction in the number of vessel transits potentially impacted by a fixed bridge. Impacts to projected future vessel traffic and existing maritime infrastructure are minimal. Therefore, a fixed bridge with 42-foot vertical clearance remains the recommended alternative.

Contract provisions for the American Association of State Highway and Transportation Officials Load and Resistance Factor Design (AASHTO LRFD) of the ship impact protection system were developed for inclusion in the Design-Build contract and are included in Appendix B. The bridge's operational classification has been assumed to be "Critical." The model vessel for structural design of the bridge piers and protection system will be governed by the AASHTO minimum design load of drifting empty hopper barge. This is due to the large number of recreational craft, and the lack of commercial shipping in the vessel population.

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Introduction

As a part of the Anacostia Waterfront Initiative, which pledges to restore and revitalize the Anacostia River and surrounding neighborhoods, the District of Columbia is preparing to replace the Frederick Douglass Memorial Bridge (FDMB) and upgrade the South Capitol Street corridor. Built in 1949, the existing bridge has been rehabilitated as an interim solution to address the immediate structural deficiencies; however, replacement of the bridge is necessary to address long-term structural needs and safety issues.

The Frederick Douglass Memorial Bridge is located at the southeast quadrant of the District of Columbia and immediately northeast of the confluence of the Potomac and Anacostia Rivers. The Washington US Navy Yard is directly upstream from the existing bridge. The ballpark for the Washington Nationals Major League Baseball team is directly north of the bridge. South of the bridge is the Joint Base Anacostia-Bolling, and east of the bridge is Poplar Point. Constructed in 1949, and dedicated to Frederick Douglass in October 1964, the existing bridge carries South Capitol Street over the Anacostia River.

Replacement of the 63-year-old bridge supports economic development, improves multi-modal transportation options, optimizes community accessibility, and increases pedestrian and vehicular safety. Additionally, new drainage and storm water management will provide further opportunities for sustainable development.

Parsons Brinckerhoff was retained to perform a Navigation Channel Evaluation to support a US Coast Guard Section 9 Bridge Permit Application for the replacement bridge. The existing bridge is a moveable span bridge. A fixed-span bridge design reduces cost of reconstruction by an estimated $140 million. Transitioning from a moveable span bridge to a fixed bridge would save the District an additional $100,000 per year on operations and maintenance typically required for a drawbridge. The Navigation Channel Evaluation assesses the impact of fixed and movable bridges on river users.

An initial ("Phase 1") Navigation Evaluation was conducted; the results and conclusions are summarized in a report entitled *Anacostia River Navigation Evaluation* dated September 20, 2013. This report summarized the existing vessel population, clearances of other bridge structures on the Anacostia and Potomac Rivers, environmental and land use considerations affecting future vessel traffic, projected future vessel populations, impacts of the proposed replacement bridge of future vessel traffic and existing infrastructure, and recommended design build contract provisions for vessel impact protection design.

Under Phase 1 of the Navigation Evaluation Report, the current vessel population was documented from surveys of river users and review of bridge opening logs for the existing bridge. Phase 2 of the study consisted of collection of actual vessel transit volume from July 7, 2013 until October 6, 2013 using an EarthCam video camera. The existing vessel population developed as part of the Phase 1 study has been revised based on the additional monitoring data. Future vessel traffic was projected based on research of environmental and land use considerations and future plans of existing users and property owners along the river.

This report summarizes the results of the Phase 1 evaluation, the additional data collected under Phase 2, and the effect of the additional data on the conclusions drawn from Phase 1. Final recommendations for the replacement structure are presented, considering the data gathered in both phases.

Section 1.0: Existing Conditions

1.1. Existing Bridge Operations

Tabulated and handwritten records of daily Frederick Douglass Memorial Bridge opening logs covering the period from September 2008 until November 2013 and from September 2002 until January 2012 are available in Appendices C-1 and C-2, respectively. The bridge opening logs, which were obtained from DDOT, are categorized by year.

A total of 21 bridge openings for passage of vessels (excluding openings for test purposes) are documented during the 11-year period of the available logs. All but four of these openings occurred prior to 2007.

1.2. Existing Vessel Population

The existing vessel population was generated in two phases. Under Phase 1 of the evaluation, the existing vessel population was derived from a combination of bridge opening logs provided by DDOT, and a survey of potential waterway users. The survey on annual bridge transits and vessel dimensions was conducted by Parsons Brinckerhoff in April 2013, as a part of the initial phase of this study. Fifty-six participants including various local marinas, recreational teams, clubs, and associations, yacht clubs, and independent operators were selected to contribute. To supplement survey responses, an in-person meeting was arranged for significant parties, including the US Navy and US Coast Guard, to gather additional information.

Data from survey forms and bridge opening logs were assembled into a single database. Additional vessel characteristics required for the development of vessel impact protection requirements were calculated or estimated from the available data and similar vessels were grouped by vessel type and size. Each vessel group or class typically consists of multiple vessels with multiple owners and points of origin/destination.

Phase 2 of the evaluation consisted of the collection of video footage, which was used to monitor and document vessel transit under the FDMB. The transit footage was collected using an EarthCam camera system and the Control Center 7 comprehensive webcam management service. Archived, time-lapsed video recordings were captured from a live stream of the vessels travelling along the Anacostia River and under the FDMB for approximately 3 months from July 7, 2013 until October 6, 2013.

The live, 24-hour video recordings were compressed into time-lapsed clips ranging from approximately 2½ to 3½ hours per day. Parsons Brinckerhoff reviewed footage and collected the volume of transits which occurred between the hours of 5:00 AM and 9:00 PM, a time frame which provided the greatest visibility of vessel traffic.

The camera's location was not close enough to record specifics for certain vessel characteristics, including vessel name and registration/documentation numbers, vessel dimensions, and docking location. Each vessel was classified by its visual appearance. The following classification categories were selected based on the types of vessels which appeared in the video footage: rowing shell, tug, barge, power boat, kayak, water taxi, police boat, fire boat, canoe, sailboat, and paddle boat. The majority of the boat traffic consisted of small to medium-sized recreational vessels, such as rowing shells and power boats. The *Baseball Boat*, a water taxi managed by the Potomac Riverboat Company, and the American River Water Taxi were some of the larger vessels with consistent transit under the bridge. No openings of the FDMB were observed during review of the 3 months of archived video footage.

Approximately 5,238 vessels were observed transiting the FDMB from July 7, 2013 until October 6, 2013. Table 1.1 shows vessel traffic arranged by its time of transit. A more comprehensive record of the vessels transits under the FDMB collected from 7/7/2013 until 10/6/2013 is available in Appendix A.

The video monitoring data was extrapolated to obtain average annual vessel transits for each category. This vessel population was then compared with the original database formulated from bridge opening logs and user surveys during Phase 1. Several observations resulted from this comparison:

- Recreational power boats, which made up over 90 percent of the vessel population in the original analysis, made about one quarter of the transits that would be expected during this time period based on data from the surveys.
- The large number of human-powered craft (e.g., rowboats and kayaks) had not been captured in the original survey.

Table 1.1: Summary of FDMB Vessel Transits (7/7/2013 to 10/6/2013)

		Row	Police	Motor Yacht	Tug	Barge	Power	Kayak	Canoe	Water Taxi	Sailboat	Paddle	Fire	Total
July (7/7/2013-7/31/2013)	AM	253	20	15	16	8	235	19	1	2	1	0	0	570
	PM	167	30	122	13	6	392	37	2	48	16	0	0	833
July Total								1403						
August (8/1/2013-8/31/2013)	AM	245	17	21	53	1	242	31	0	7	0	0	0	617
	PM	166	28	190	59	1	619	235	1	57	4	0	0	1360
August Total								1977						
September (9/1/2013-9/30/2013)	AM	108	14	24	19	12	173	79	0	3	8	0	0	440
	PM	229	24	65	9	8	401	123	0	54	17	2	1	933
September Total								1373						
October (10/1/2013-10/6/2013)	AM	49	2	3	7	4	58	32	0	0	1	0	0	156
	PM	74	2	12	9	2	123	101	0	2	4	0	0	329
October Total								485						
Overall	AM	655	53	63	95	25	708	161	1	12	10	0	0	1783
	PM	636	84	389	90	17	1535	496	3	161	41	2	1	3455
Overall Total								5238						

- There is much more tug and barge traffic than what was originally assumed though these vessels generally do not require bridge openings. All tug traffic included in the original analysis was obtained from bridge opening logs (i.e.: a bridge opening was required). The video monitoring revealed that a substantial number of tug and barge transits occurs without bridge openings. All tug and barge transits during the time of the video monitoring were conducted without a bridge opening.
- There is considerably less police and fire boat traffic than was estimated from the surveys.
- There is more recreational sail traffic than was included in the original analysis, but it is composed of smaller vessels that do not require a bridge opening.

The original vessel population was revised incorporating the new monitoring data. New vessel groups were added for human-powered craft and barges. Existing vessel groups for tugs and recreational sailing vessels were split to separate vessels requiring a bridge opening from the rest of the vessels in the group. For vessel types observed during the monitoring period, the number of transits was adjusted (up or down) using the values extrapolated from the monitoring data. In addition, transits originally mistakenly attributed to the sailing vessel *American Spirit* and passenger vessel *Cherry Blossom* in the Phase 1 evaluation were eliminated (see section 3.1 for further discussion).

Table 1.2 shows the resulting vessel population by vessel group. The "Average Annual Trips" column represents the number of recorded transits divided by the time period of the source data set (one year for the survey, 0.252 years (3 months) for the video monitoring, and 11 years for the bridge logs). The "Max Air Gap" column indicates the largest required air gap for vessels within the vessel group. Generally there are vessels within each group requiring smaller clearances than the maximum vessel for the group, Therefore, not all transits for a vessel group with a Max Air Gap greater than the existing closed bridge clearance necessarily required an opening.

Table 1.2 Existing Vessel Population

Group No.	Vessel Type	Max Air Gap (ft)	Average Annual Trips
1	US Coast Guard Buoy Tender	70	2
2	US Coast Guard Patrol Craft	60	1
3.a	Tug Boat	>40	0.8
3.b	Tug Boat	<40	734
4	Naval Vessel	140	0.2
5	Fire/Police Boats	26	548
6	Small Recreational (Power Boats)	22	10692
7	Passenger Vessel (Non-Sail)	18	694

8.a	Recreational Sail	>40	0.2
8.b	Recreational Sail	28	201
9	Tall Ships/Large Sail	107	0.4
10	Barge	<40	167
11	Human-Powered Craft	<5	7745

1.3. Existing Anacostia River Clearances

Under the Phase 1 investigation, clearances for existing bridge structures were obtained from National Oceanographic and Atmospheric Administration (NOAA) navigation chart 12285, updated to March 1, 2013. No field verification was performed. Published river mile-points were available for the FDMB (mile-point 1.2) and the CSX Railroad Bridge (mile-point 3.4). Mile-points for the remaining structures were obtained by scaling the distance to the structure from these known mile-points. Bridge clearances for the Anacostia River to the head of navigation are presented in Table 1.3.

Table 1 3: Existing Anacostia River Clearances

Name of Bridge	Bridge Type	Mile Point	Horizontal Clearance (ft)	Vertical Clearance (ft)
Frederick Douglass Memorial Bridge	Swing	1.2	149	40
11th St Bridge	Fixed	2.1	200	28
John Phillip Sousa Bridge	Fixed	2.8	114	35
CSX Railroad Bridge	Lift	3.4	33	5 (down) 29 (up)
Whitney Young Memorial Bridge	Fixed	4.1	90	23
Benning Bridge	Fixed	4.6	40	16
Metro Bridge	Fixed	4.6	40	16
Railroad Bridge	Fixed	6.6	69	12
Route 50 Bridge	Fixed	6.7	76	16

Existing vertical clearances on the Anacostia from the beginning of the study area to the Benning Bridge exceed those on the adjacent reach of the Potomac.

1.4. Potomac River Downstream Clearances

Downstream of the confluence of the Potomac and Anacostia Rivers, there are two crossings of the Potomac River. The following clearance information for these bridges is included for informational purposes:

- Woodrow Wilson Memorial Bridge (Bascule) Horizontal Clearance 175 feet, Closed Vertical Clearance 76 feet, Open Unlimited.
- Harry W. Nice Bridge (Fixed) Horizontal Clearance 700 feet, Vertical Clearance 105 feet (135 feet for middle 480-foot-width).

1.5. Potomac River Upstream Clearances

Crossing the Potomac River, upstream of the confluence of the Potomac and Anacostia Rivers are a number of bridges that are regularly transited by local river users. The following clearance information for these bridges is presented for informational purposes:

- Key Bridge (Fixed) Horizontal Clearance 207 feet, Vertical Clearance 61 feet (for 80-foot-width).
- Theodore Roosevelt Bridge (Fixed) Horizontal Clearance 198 feet, Vertical Clearance 24 feet (29 feet at center of main span).
- Arlington Memorial Bridge (Fixed) Horizontal Clearance 142 feet, Vertical Clearance 30 feet (for 80-foot-width).
- George Mason, 14th Street Bridges, WMATA and Long Bridge (five bridges) (Fixed) Horizontal Clearance 104 feet, Vertical Clearance 18 feet.

Section 2.0: Environmental and Land Use Considerations

2.1. Existing Environment and Land Use

Existing environment and land use were investigated under the Phase 1 evaluation. The majority of the existing land use along the Anacostia River was found to be park land (Figure 2.1). On the east side of the river, park land is present throughout the entire river bank starting just north of the existing FDMB. East and south of the FDMB is occupied by other parks, recreation, and open space use, and public and federal uses (e.g., Bolling Air Force Base). On the west side of the river, the land along the river north of the 11th Street Bridge is occupied by park land. Between the 11th Street Bridge and FDMB, the land is occupied by the Capitol Riverfront neighborhood, a 500-acre, mixed-use neighborhood that includes the US Navy Yard, the US Department of Transportation Headquarters, Nationals Park, Capitol Quarter Townhouse community, Diamond Teague Park, Half Street entertainment district, and The Yards.

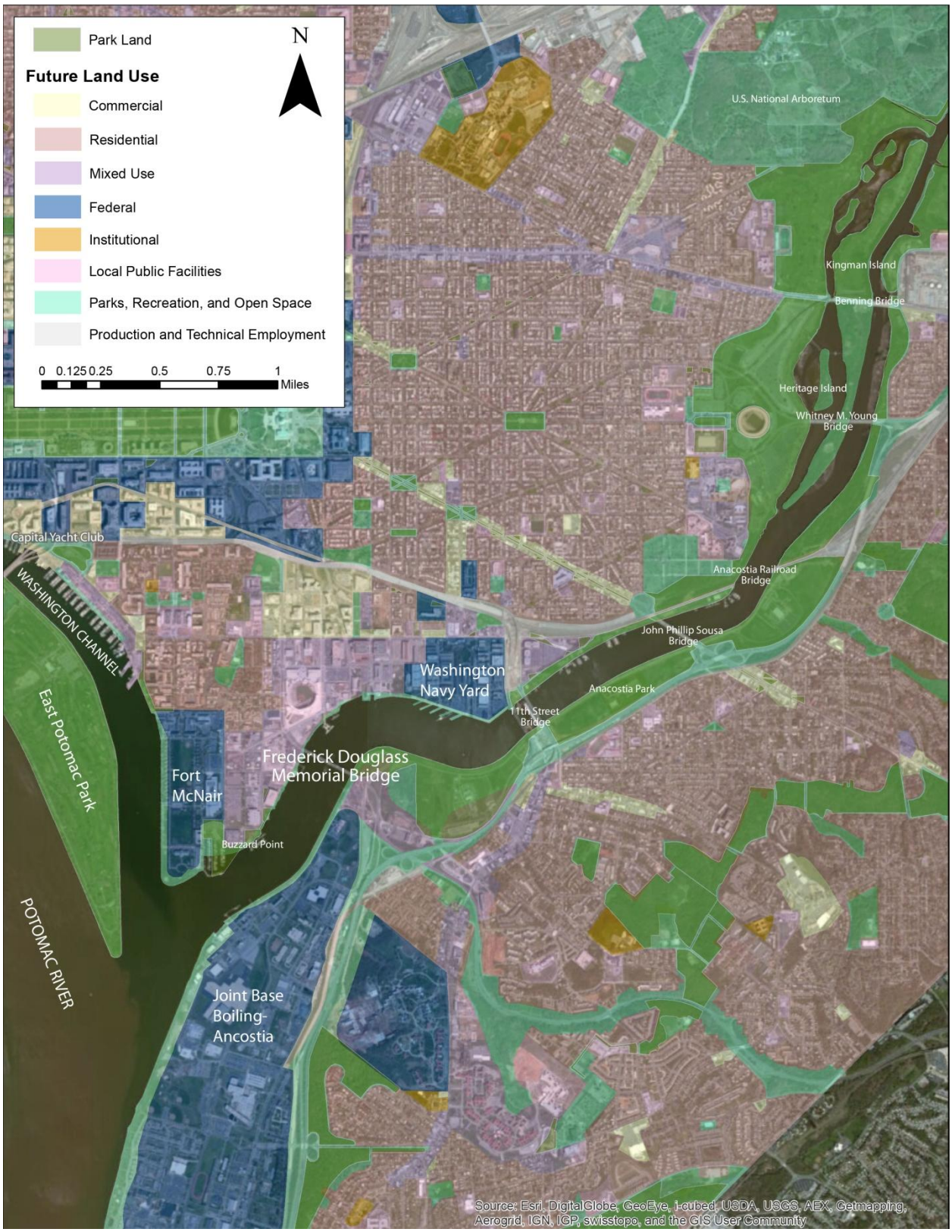


Figure 2.1: Land Use along the Anacostia River

2.2. Future Development and Vessel Population

The potential for future development and its effects on river traffic were examined in the Phase 1 evaluation. It was found that a number of planned developments will likely, directly or indirectly, increase the number of recreational and passenger (i.e.; water taxi, and tour boat) craft using the Anacostia. These additional craft are expected to follow the same distribution of vessel sizes as the vessel population currently using the river and are not expected to be impacted by a fixed bridge meeting or exceeding the clearance of the current bridge.

Increase in the number of commercial/industrial vessels was deemed unlikely, especially upriver of FDMB, because:

- The existing land use along the Anacostia River is mostly designated as park land and for recreational use (with no anticipated changes to the land use that could attract commercial vessels other than passenger vessels along the Anacostia River).
- The Anacostia River navigational channel width and depth are substantially reduced north of the 11th Street Bridge, which prevents navigation of larger commercial vessels north of the 11th Street Bridge.

Development projects identified under the Phase 1 evaluation that may contribute to an increase in recreational or passenger craft include:

- The Yards Park, which includes a public marina,
- Boathouse Row Redevelopment, including an expanded boathouse, marina, dock and water recreation uses,
- Poplar Point, including a waterfront park,
- Capital Yacht Club has indicated plans for expansion, and
- American River Taxi and the Potomac River Boat Company have indicated plans for larger fleets.

Other commercial and residential projects may also increase recreational vessel users, due to their proximity to the Anacostia River, including:

- Hill East Waterfront Redevelopment and
- Enhancement of Marvin Gaye and Kingman and Heritage Islands Parks.

Figure 2.2 shows projected future land use along the Anacostia River. More detail regarding future development projects and their projected effects on future vessel traffic along and/or near the Anacostia River may be found in the Sections 2.2, 2.3 and Appendix D of the *Phase 1 Anacostia River Navigation Evaluation* Report.

Figure 2.2: Potential Development Projects along the Anacostia River

Vessels resulting from the above developments are projected to have a similar size distribution to comparable vessels currently using the waterway and are not expected to be impacted by a fixed bridge meeting or exceeding the clearance of the current bridge. Therefore, the future vessel population is projected to be similar to the existing population (described in Section 1.2), but potentially with a greater number of small recreational and passenger craft.

Two future developments potentially impacted by construction of a fixed bridge have been identified in the Phase 1 evaluation:

- The Earth Conservation Corps has indicated plans, in partnership with the *Pearl* Coalition, to bring a replica of the schooner Pearl to Diamond Teague Park. It is still unclear whether this is intended to be a display ship or an active sailing vessel, and the proposed timeline has not been established. If it is a display ship, the masts could be installed after the vessel is upriver of the FDMB. If it is an active sailing ship, it would need to be moored downriver of the FDMB.
- The US Navy has indicated that the DS Barry will eventually be relocated or possibly scrapped, then possibly replaced with another display ship. When this happens, each vessel (DS Barry and its replacement) would need to transit the bridge once.

Section 3.0: Impacts on Vessels

3.1. Impacts on Future Vessel Traffic

The existing vertical clearance of the FDMB is 40 feet in the closed position and unlimited in the open position. The proposed replacement of the FDMB will primarily affect users transiting to destinations located between FDMB and the 11th Street Bridge (with a fixed vertical clearance of 28 feet). Figure 3.1 shows that a vertical clearance greater than 30 feet for a fixed bridge or movable bridge in the closed position accommodates 96.7 percent of the projected vessel traffic. The current fixed design for the new FDMB provides a clearance of 42 feet, comparable to the existing bridge in the closed position, and will accommodate 99.9 percent of the projected vessel population.

As the existing bridge has a charted horizontal clearance of 149 feet, it is recommended that the existing clearance be maintained, and the current design accommodates that easily. This horizontal clearance would have no impact on projected vessel traffic.

Based on a meeting with US Navy representatives on May 23, 2013, with exception of the disposal/replacement of the *DS Barry*, the US Navy has no current requirement for Naval Vessels to transit the Potomac River north of Robinson Terminal in Alexandria, VA and the Naval Research Lab in Washington, DC. Additionally, operational naval vessels have no current requirement to enter the Anacostia River. The maximum size vessel assigned to US Fleet Forces that is authorized to transit the Anacostia River is the Patrol Ship, which would fit under a 42-foot bridge height. The US Navy Yard must have boat access, at least 67 feet horizontally and 35 feet vertically, to accommodate critical military traffic. The US Navy representatives also noted that tall-ships occasionally visit the US Navy Yard. A fixed bridge with 42-foot vertical clearance would limit or eliminate the potential for these visits.

As previously noted in the Phase 1 study results, the proposed clearance would be inadequate for the following vessels: *James Rankin,* US Coast Guard Patrol Craft, *Triton,*

Captain Nelson, Kings Pointer, Minnie V , and *Pride of Baltimore II,* and for the eventual removal and replacement of the *DS Barry.*

The buoy tender *James Rankin* and US Coast Guard patrol craft, which were not included in US Coast Guard's survey response, are reported to account for one annual round trip, and one annual transit for maintenance of aids to navigation (ATONS), respectively. No transits are recorded in the bridge opening logs for the *James Rankin* since 2003. Discontinuance of the ATONS serviced by this vessel is under consideration by the US Coast Guard. No additional transits by US Coast Guard patrol craft were recorded since 2005. Neither the *James Rankin*, nor US Coast Guard patrol craft, will be able to pass under a bridge with 42-foot clearance at any stage of the tide.

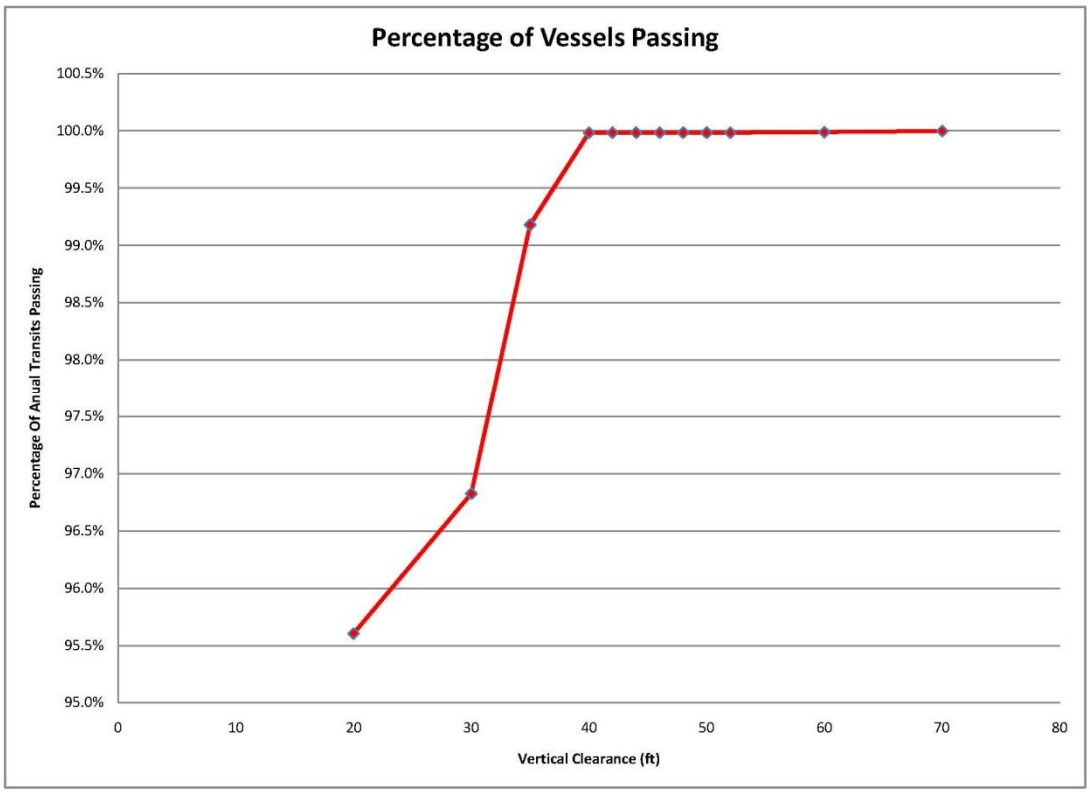


Figure 3.1: Vessel Transits for a Fixed or Movable Bridge in the Closed Position as a Function of Vertical Clearance

Exact required air gap values for *Kings Pointer* and the privately-owned sailing vessel *Triton* could not be determined, but are assumed to exceed 40 feet since a bridge opening was required for transit. Passage of the *Triton* was recorded in the bridge logs in 2001. No passages have been recorded since, though it is noted that four transits by unidentified sailing vessels are recorded in the bridge logs before 2005. The vessel *Kings Pointer*, now operated as a training ship by the US Merchant Marine Academy, was

recorded transiting the bridge in 2003. No passage by this vessel has been recorded since, though it is noted that five transits by unidentified "US Navy Ships" are recorded in the logs prior to 2005. The *Cherry Blossom*, estimated to account for 25 annual transits in the Phase 1 evaluation, is no longer included in the existing vessel population, as it is has been verified by the Potomac Riverboat Company that this vessel does not transit the bridge. The *Cherry Blossom* was not observed transiting the bridge during the review of the EarthCam video footage, and no transits by this vessel are documented in the bridge opening logs.

Similarly, transits for the *American Spirit*, estimated to account for 48 average annual transits in the Phase 1 study report based on interpretation of the survey results, have been significantly reduced. The vessel operator, DC Sail, reports that the vessel does not regularly transit the bridge. One transit by this vessel is recorded in the bridge logs in 2006.

Based on the vessel population described in Section 1.1, vessels potentially impacted by construction of a fixed FDMB replacement bridge with a clearance of 42 feet are presented in Table 3.1. A total of 4.1 average annual vessels transits are potentially impacted by construction of a fixed span.

Table 3.1: Vessels Impacted by the Proposed Clearance

Name of Vessel	Vessel Type	Owner	Air Gap (ft)	Last Recorded Transit	Average Annual Transit
James Rankin	Buoy Tender	US Coast Guard	70	2003	2
YP-684; YP-676; YP-682; YP-688; YP-679	Patrol Craft	US Coast Guard	60	2005	1
Triton	Recreational Sail	Shawn P. Callaghan	> 40	2001	0.2
Capt. Nelson	Tug	Smith Brothers, Inc.	> 40	2004	0.2
Kings Pointer	Training Vessel		140	2003	0.2
American Spirit	Sail Boat/Tall Ship	DC Sail (NMHF)	78	2006	0.1

Minnie V	Passenger Vessel (Sail)	Living Classrooms Foundation, Inc.	65	2012	0.2
Pride of Baltimore II	Passenger Vessel (Sail)	Pride of Baltimore, Inc.	107	2012	0.2
				Total Average Transits	4.1

Impacts to projected future vessel traffic are expected to be minimal. While recreational and passenger vessel traffic is projected to increase in volume, the vessel sizes expected will be accommodated by the proposed 42-foot vertical clearance.

The only exceptions are expected to be tall-ship visits and replacement of the *DS Barry* at the US Navy Yard, and Earth Conservation Corps' planned installation of a replica of the schooner *Pearl*. If the DS *Barry* is removed after FDMB construction, its superstructure will have to be removed while at dock at the US Navy Yard to allow transit under the bridge. Installation of a similar size display vessel at the US Navy Yard will need to be coordinated and accomplished with the US Navy prior to the construction of the FDMB.

As discussed in Section 2.2, the intended use of the replica *Pearl* is not clear. If it is intended as a display ship, it could conceivably be transported to the site with its masts removed and reinstalled in-situ.

3.2. Impacts on Existing Maritime Infrastructure

The replacement bridge is proposed to be located south of the existing FDMB; therefore, operation of existing maritime infrastructure north of the existing bridge will not be adversely affected.

A fuel transfer pier exists on the east bank of the Anacostia River approximately 310 feet downstream of the existing bridge's south fascia. This pier is used to transfer fuel from barges for storage and use at Andrews Air force Base via a fuel pipeline along Suitland Parkway. The proposed configuration of the new bridge will locate the face of a bridge pier approximately 165 feet upstream of the fuel pier. Given that the tug and barge typically extend 130 to 165 feet upstream of the fuel pier in the current mooring configuration, it is likely that changes to the barge approach path and mooring arrangement will be required for safe operation, particularly on approach to the fueling pier.

Two additional piers and associated mooring and breasting structures, located on the west bank of the Anacostia to the south of the existing bridge, may be impacted. These

are remnants of an earlier fuel storage facility previously located south of the bridge and removed circa 2007 and are no longer in use. Therefore, demolition of the northern pier structure and associated mooring structures are not expected to have any significant impact.

These impacts will occur for any bridge on this alignment, whether fixed or movable. Additional detail regarding the potentially impacted existing maritime infrastructure south of the Frederick Douglass Memorial Bridge is available in Section 3.2 of the *Phase 1 Anacostia River Navigation Evaluation Report.*

3.3. Design-Build Contract Provisions for Vessel Impact Protection

During the Phase 1 evaluation, transits by towing vessels (tugs) documented in the bridge opening logs were omitted from the vessel population because tug transits occurred prior to 2006 with an annual frequency of less than one and were thought to have been related to past construction activity.. The video monitoring conducted in Phase 2 revealed that there was a substantial number of tug and/or barge transits during the monitoring period. Review of the video suggests that all of the barge transits are attributable to a single barge believed to be associated with the adjacent construction at the 11th Street Bridge and considered a temporary occurrence. Since tugs transiting without a vessel in tow will have displacements too small to be of concern for vessel impact purposes and documented barges are associated with construction that will be complete before construction of the new bridge, towing vessels and barges remain excluded from the vessel population for ship impact design purposes.

Conclusion and Recommendations

The proposed vertical clearance of 42 feet and horizontal clearance of 150 feet for the fixed bridge option will accommodate approximately 99.9 percent of the current and projected future vessel traffic.

The number of average annual vessel transits potentially impacted by a fixed span has been reduced from 77 reported in the Phase 1 study report, to 4.1. Three of these transits are attributable to US Coast Guard patrol craft and the buoy tender *James Rankin*, none of which have been recorded transiting the bridge since 2005. The remaining potentially impacted vessels are included in the vessel population by virtue of their appearance in the bridge opening logs for one round-trip transit in the 12-year period covered by the logs. Plans for future transits are unknown.

Therefore, selection of the fixed bridge alternative with a vertical clearance of 42 feet is still recommended.

Appendix A: FDMB Vessel Transits from 7/6/2013 to 10/6/2013

Table A.1: FDMB Vessel Transits - (7/6/2013 to 7/31/2013)

			Row	Police	Motor Yacht	Tug	Barge	Power	Kayak	Canoe	Water Taxi	Sail boat
Sun	7-Jul	AM	13	2	-	-	-	5	-	-	-	-
		PM	1	-	9	-	-	35	-	-	6	2
Mon	8-Jul	AM	14	-	1	-	-	1	-	-	-	-
		PM	9	-	5	-	-	4	-	-	-	-
Tues	9-Jul	AM	17	-	-	-	-	9	8	-	-	-
		PM	6	-	-	-	-	13	-	-	2	-
Wed	10-Jul	AM	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Thu	11-Jul	AM	12	-	-	1	-	12	-	-	-	-
		PM	13	-	6	2	-	16	-	-	-	2
Fri	12-Jul	AM	5	1	-	-	-	12	-	-	-	-
		PM	8	-	5	1	-	12	1	-	3	-
Sat	13-Jul	AM	-	-	-	-	-	2	-	-	-	-
		PM	-	-	11	1	-	33	-	1	5	-
Sun	14-Jul	AM	12	1	3	-	-	10	1	1	-	-
		PM	-	1	13	-	-	30	-	-	2	2
Mon	15-Jul	AM	10	1	-	6	-	15	-	-	-	-
		PM	4	3	1	-	-	16	-	-	-	-
Tues	16-Jul	AM	17	-	-	-	-	25	-	-	-	-
		PM	24	-	-	3	-	23	2	1	-	-
Wed	17-Jul	AM	20	-	-	2	-	25	-	-	-	-
		PM	8	-	2	2	-	20	1	-	6	-

Thu	18-Jul	AM	20	-	-	2	-	20	1	-	-	-
		PM	8	-	2	-	-	10	-	-	-	-
Fri	19-Jul	AM	6	2	1	-	-	11	-	-	-	-
		PM	-	-	4	1	-	29	-	-	3	-
Sat	20-Jul	AM	-	-	-	1	-	7	-	-	-	-
		PM	-	4	9	-	-	24	4	-	3	2
Sun	21-Jul	AM	17	4	-	-	-	4	-	-	-	-
		PM	1	3	8	2	-	27	1	-	-	-
Mon	22-Jul	AM	7	1	3	4	-	9	-	-	-	-
		PM	5	4	-	-	-	12	-	-	3	-
Tues	23-Jul	AM	14	-	0	-	3	9	-	-	-	-
		PM	11	-	2	1	1	17	-	-	2	-
Wed	24-Jul	AM	18	-	1	-	4	14	-	-	-	-
		PM	16	2	3	-	0	9	-	-	-	2
Thu	25-Jul	AM	10	2	0	-	0	5	-	-	2	-
		PM	20	-	5	-	2	7	-	-	2	1
Fri	26-Jul	AM	9	-	3	-	0	3	-	-	-	-
		PM	8	3	14	-	0	17	4	-	5	-
Sat	27-Jul	AM	2	2	1	-	0	7	8	-	-	-
		PM	0	1	10	-	0	7	14	-	3	2
Sun	28-Jul	AM	11	-	0	-	0	8	1	-	-	-
		PM	0	6	5	-	0	9	5	-	3	-
Mon	29-Jul	AM	4	-	1	-	0	3	-	-	-	-
		P	6	1	3	-	0	6	3	-	-	-

		M										
Tues	30-Jul	AM	9	4	0	-	0	6	-	-	-	-
		PM	14	-	2	-	0	11	2	-	-	1
Wed	31-Jul	AM	6	-	1	-	1	4	-	-	-	1
		PM	5	2	3	-	3	5	-	-	-	2
Total			420	50	137	29	14	627	56	3	50	17

Table A.2: FDMB Vessel Transits - (8/1/2013 to 8/31/2013)

			Row	Police	Motor Yacht	Tug	Barge	Power	Kayak	Canoe	Water Taxi	Sail boat
Thu	1-Aug	AM	14	-	-	2	-	7	-	-	-	-
		PM	-	-	6	2	-	2	-	-	-	-
Fri	2-Aug	AM	10	-	6	2	-	10	-	-	3	-
		PM	1	-	12	5	-	33	-	-	-	-
Sat	3-Aug	AM	5	-	-	-	-	5	1	-	-	-
		PM	2	-	10	2	-	14	10	-	2	-
Sun	4-Aug	AM	18	-	-	-	-	18	6	-	-	-
		PM	1	2	9	4	-	73	30	-	2	-
Mon	5-Aug	AM	15	-	-	5	1	14	-	-	-	-
		PM	11	3	3	3	-	30	1	-	3	-
Tues	6-Aug	AM	5	-	1	2	-	6	-	-	-	-
		PM	12	6	5	6	-	14	-	-	4	-
Wed	7-Aug	AM	6	2	-	2	-	7	-	-	-	-
		PM	9	-	8	-	-	18	-	-	4	-
Thu	8-Aug	AM	3	4	1	4	-	11	-	-	-	-
		PM	1	5	8	-	-	13	-	-	2	-
Fri	9-Aug	AM	2	8	-	-	-	5	2	-	-	-
		PM	-	4	8	2	-	10	2	-	3	-
Sat	10-Aug	AM	15	-	-	-	-	10	3	-	-	-
		PM	-	1	12	5	-	46	25	-	3	2
Sun	11-Aug	AM	13	2	2	1	-	11	-	-	-	-
		PM	2	-	18	-	-	38	51	-	3	2

Mon	12-Aug	AM	8	1	-	2	-	7	-	-	-	-
		PM	13	1	3	3	-	30	-	-	6	-
Tues	13-Aug	AM	-	-	-	2	-	2	1	-	2	-
		PM	14	-	2	2	-	14	1	-	4	-
Wed	14-Aug	AM	-	-	-	6	-	5	-	-	-	-
		PM	14	-	2	2	-	32	-	-	3	-
Thu	15-Aug	AM	6	-	-	7	-	15	2	-	-	-
		PM	4	-	-	-	-	16	-	-	8	-
Fri	16-Aug	AM	4	-	-	-	-	8	1	-	-	-
		PM	1	3	7	-	1	39	12	-	2	-
Sat	17-Aug	AM	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Sun	18-Aug	AM	11	-	-	-	-	5	1	-	-	-
		PM	-	-	4	-	-	6	6	-	-	-
Mon	19-Aug	AM	1	-	-	1	-	7	-	-	-	-
		PM	11	1	-	-	-	18	-	-	-	-
Tues	20-Aug	AM	4	-	-	-	-	9	-	-	2	-
		PM	12	-	4	-	-	12	-	-	-	-
Wed	21-Aug	AM	12	-	1	-	-	9	2	-	-	-
		PM	8	-	2	4	-	14	2	-	-	-
Thu	22-Aug	AM	13	-	2	2	-	9	-	-	-	-
		PM	11	-	9	4	-	20	-	-	1	-
Fri	23-Aug	AM	11	-	-	2	-	8	-	-	-	-

		PM	-	3	6	2	-	4	1	-	-	-
Sat	24-Aug	AM	4	-	2	-	-	9	3	-	-	-
		PM	2	-	15	1	-	58	53	-	2	-
Sun	25-Aug	AM	20	-	6	1	-	12	15	-	-	-
		PM	8	1	21	3	-	95	71	-	2	-
Mon	26-Aug	AM	13	-	-	3	-	11	-	-	-	-
		PM	2	-	4	3	-	7	-	-	-	-
Tues	27-Aug	AM	15	-	-	9	-	6	-	-	-	-
		PM	16	-	3	6	-	12	-	-	1	-
Wed	28-Aug	AM	14	-	-	-	-	9	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Thu	29-Aug	AM	9	-	-	-	-	13	-	-	-	-
		PM	5	-	9	2	-	13	-	1	2	-
Fri	30-Aug	AM	12	-	-	-	-	12	-	-	-	-
		PM	7	-	9	2	-	11	-	-	2	-
Sat	31-Aug	AM	-	-	-	-	-	11	-	-	-	-
		PM	2	-	8	4	-	51	26	-	3	-
Total			432	47	228	120	2	1014	328	1	69	4

Table A.3: FDMB Vessel Transits - (9/1/2013 to 9/30/2013)

			Row	Police	Motor Yacht	Tug	Barge	Power	Kayak	Canoe	Water Taxi	Sail boat
Sun	1-Sep	AM	8	-	1	1	-	13	4	-	-	-
		PM	-	4	1	-	2	49	48	-	8	-
Mon	2-Sep	AM	19	-	-	-	-	18	3	-	-	-
		PM	-	2	4	-	-	28	10	-	2	-
Tue	3-Sep	AM	2	-	-	-	2	2	2	-	-	-
		PM	7	3	-	-	-	14	-	-	-	-
Wed	4-Sep	AM	8	-	-	-	-	4	2	-	-	-
		PM	10	-	-	-	-	11	1	-	-	-
Thu	5-Sep	AM	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Fri	6-Sep	AM	5	-	2	-	-	3	-	-	-	-
		PM	16	-	5	-	-	14	-	-	8	-
Sat	7-Sep	AM	9	-	3	2	1	16	10	-	-	-
		PM	-	-	4	-	-	10	12	-	-	-
Sun	8-Sep	AM	4	-	2	-	-	9	14	-	-	-
		PM	1	-	2	-	-	6	9	-	4	3
Mon	9-Sep	AM	3	-	2	-	-	6	-	-	-	-
		PM	20	-	2	-	2	18	-	-	-	-
Tue	10-Sep	AM	-	-	-	-	3	3	-	-	-	1
		PM	9	-	2	-	-	11	-	-	4	-
Wed	11-Sep	AM	2	-	-	-	1	5	-	-	-	-
		PM	13	-	2	-	-	14	-	-	-	-

Thu	12-Sep	AM	9	-	5	-	3	14	-	-	-	-
		PM	23	-	2	-	-	4	-	-	-	-
Fri	13-Sep	AM	4	-	1	-	-	3	-	-	-	1
		PM	6	-	4	-	-	14	7	-	2	3
Sat	14-Sep	AM	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Sun	15-Sep	AM	7	-	-	-	-	13	-	-	-	-
		PM	-	-	8	2	1	34	5	-	2	-
Mon	16-Sep	AM	-	2	3	-	1	4	-	-	-	-
		PM	-	3	1	-	2	-	-	-	-	1
Tue	17-Sep	AM	-	-	-	-	-	-	-	-	-	-
		PM	15	1	-	-	1	15	-	-	1	-
Wed	18-Sep	AM	5	2	-	-	-	7	-	-	-	1
		PM	20	5	3	2	-	17	-	-	2	1
Thu	19-Sep	AM	-	2	-	1	-	7	-	-	1	-
		PM	11	-	2	-	-	20	-	-	1	1
Fri	20-Sep	AM	2	1	-	-	-	3	-	-	-	-
		PM	10	1	-	2	-	19	3	-	6	-
Sat	21-Sep	AM	9	1	-	-	-	11	20	-	2	-
		PM	-	-	3	-	-	10	12	-	5	-
Sun	22-Sep	AM	11	-	-	-	-	12	14	-	-	-
		PM	-	-	9	-	-	38	-	-	3	2
Mon	23-Sep	AM	-	2	-	4	-	4	-	-	-	1
		PM	15	1	-	-	-	13	2	-	2	1

Tue	24-Sep	AM	3	1	-	2	-	2	-	-	-	3
		PM	24	1	-	-	-	15	6	-	2	1
Wed	25-Sep	AM	-	-	-	-	-	3	-	-	-	-
		PM	-	-	-	2	-	-	-	-	-	-
Thu	26-Sep	AM	-	-	1	5	-	2	5	-	-	-
		PM	23	1	-	-	-	20	2	-	2	3
Fri	27-Sep	AM	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Sat	28-Sep	AM	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-
Sun	29-Sep	AM	6	1	4	-	1	9	7	-	-	-
		PM	-	-	1	-	-	4	6	-	-	-
Mon	30-Sep	AM	-	2	-	4	-	4	-	-	-	1
		PM	16	2	1	1	-	14	1	-	-	1
	Total		355	38	80	28	20	589	205	0	57	25

Table A.4: FDMB Vessel Transits - (10/1/2013 to 10/6/2013)

			Row	Police	Motor Yacht	Tug	Barge	Power	Kayak	Canoe	Water Taxi	Sail boat
Sun	1-Oct	AM	4	0	0	1	2	7	4	-	-	-
		PM	10	0	1	2	-	19	1	-	-	-
Mon	2-Oct	AM	0	0	0	4	-	14	-	-	-	-
		PM	26	0	2	5	1	31	-	-	-	1
Tue	3-Oct	AM	0	0	0	2	2	9	-	-	-	1
		PM	25	0	1	2	1	41	-	-	-	1
Wed	4-Oct	AM	3	1	0	0	1	1	-	-	-	-
		PM	30	2	2	0	-	25	90	-	-	-
Thu	5-Oct	AM	43	2	3	0	-	23	6	-	-	-
		PM	13	0	5	0	-	16	56	-	-	-
Fri	6-Oct	AM	2	0	0	0	-	5	22	-	-	-
		PM	0	2	3	0	-	16	44	-	2	-
		Total	156	7	17	16	7	207	223	0	2	3

Appendix B: Proposed Design Build Contract Provisions for Vessel Impact Protection

Ship Impacts

The operational classification for the Crossing shall be "Critical."

All piers shall be designed for vessel impact. The impact forces shall be computed in accordance with AASHTO LRFD Section 3.14 based on the minimum design load of a drifting hopper barge as described in AASHTO LRFD Section 3.14.1. A site specific vessel traffic study and risk assessment will not be required.

Vessel Impact Loads shall be determined by the Design-Builder. The structure shall be designed in accordance with AASHTO LRFD Bridge Design Specifications to account for the effects of impact on the sub-structure and/or the fenders.

Fenders shall be provided at the first two piers adjacent to each side of the navigation span for the protection of small vessels from damage in the event of accidental collision. Fenders may be self-supporting or attached to the piers. Table B.1 presents the characteristics of small vessels using the waterway, which are to be considered in the design of fenders.

Table B.1: Small Vessel Characteristics

Vessel Type	Draft (ft)		LOA (ft)		Beam (ft)	
	Max	Min	Max	Min	Max	Min
Fire/Police Boats	6	2	71	33	21	8
Small Recreational Craft	6	1	68	18	22	5
Passenger Vessel	8	2	110	36	33	10

Protection from vessel impacts of the piers of the existing bridge shall be maintained or provided for during construction.

Appendix C-1: Daily Draw Bridge Openings 2008 - 2013 (Tabulated)

Table C.1: Daily South Capitol Street Bridge Draw Openings - 2008

Date	Event	Draw Opened	Draw Closed	Name of Vessel	Direction of Vessel	Remarks
9/7/2008	Test	Pass	Pass			
10/19/2008	Test	Pass	Pass			
11/9/2008	Test	Pass	Pass			
12/14/2008	Test	Pass	Pass			

Table C.2: Daily South Capitol Street Bridge Draw Openings - 2009

Date	Event	Draw Opened	Draw Closed	Name of Vessel	Direction of Vessel	Remarks
4/27/2009	Test	Pass	Pass			
5/5/2009	Test	Pass	Pass			
6/7/2009	Test	Pass	Pass			
8/2/2009	Test	Pass	Pass			
9/13/2009	Test	Pass	Pass			
10/4/2009	Test	Pass	Pass			
11/8/2009	Test	Pass	Pass			

Table C.3: Daily South Capitol Street Bridge Draw Openings - 2010

Date	Event	Draw Opened	Draw Closed	Name of Vessel	Direction of Vessel	Remarks
1/24/2010	Test	Pass	Pass			
2/28/2010	Test	Pass	Pass			
3/1/2010	Test	Pass	Pass			
3/21/2010	Test	Pass	Pass			
5/2/2010	Test	Pass	Pass			
6/6/2010	Test	Pass	Pass			
7/25/2010	Test	Pass	Pass			
9/12/2010	Test	Pass	Pass			
10/3/2010	Test	Pass	Pass			
11/14/2010	Test	Pass	Pass			
12/5/2010	Test	Pass	Pass			Delay due to equipment failure

Table C.4: Daily South Capitol Street Bridge Draw Openings - 2011

Date	Event	Draw Opened	Draw Closed	Name of Vessel	Direction of Vessel	Remarks
1/9/2011	Test	Pass	Pass			
2/6/2011	Test	Pass	Pass	Problem with the outbound gate		
3/6/2011	Test	Pass	Pass			
5/1/2011	Test	Pass	Pass			
6/5/2011	Test	Pass	Pass			
7/11/2011	Test	Pass	Pass	Delay due to Bridge Span Brake release.		
8/7/2011	Test	Pass	Pass			
9/19/2011	Test	Pass	Pass	Delay due to accident with Rope crew.		
11/21/2011	Test	Pass	Pass			
12/11/2011	Test	Pass	Pass			

Table C.5: Daily South Capitol Street Bridge Draw Openings - 2012

Date	Event	Draw Opened	Draw Closed	Name of Vessel	Direction of Vessel	Remarks
2/26/2012	Test	Pass	Pass			
4/22/2012	Test	Pass	Pass			
5/13/2012	Test	Pass	Pass			
6/3/2012	Test	Pass	Pass			
9/16/2012	Test	Pass	Pass			
9/20/2012	Test	Pass	Pass	Pride Baltimore II Boat	Dock at US Navy Yard	
9/22/2012	Test	Pass	Pass	Pride Baltimore II Boat	Departure from US Navy Yard	
11/18/2012	Test	Pass	Pass			
12/16/2012	Test	Pass	Pass	Minnie-V Boat	Dock at US Navy Yard	Departure from Diamond Teague Park

Table C.6: Daily South Capitol Street Bridge Draw Openings - 2013

Date	Event	Draw Opened	Draw Closed	Name of Vessel	Direction of Vessel	Remarks
1/13/2013	Test	Pass	Pass			
2/10/2013	Test	Pass	Pass			
3/17/2013	Test	Pass	Pass			Delay due to issue with the center wedges
4/21/2013	Test	Pass	Pass	Minnie-V Boat	Departure from US Navy Yard	Departure from the Diamond Teague Park
5/19/2013	Test	15 degrees				The Span failed to open b, power went out
1/13/2013	Test	Pass	Pass			
2/10/2013	Test	Pass	Pass			
3/17/2013	Test	Pass	Pass			Minor delay due to center wedge.
4/21/2013	Test	Pass	Pass	Minnie-V Boat	US Navy Yard	Departure from the Diamond Teague Park.
5/19/2013	Test	Fail				The Span failed to open as Power went out.
9/8/2013	Test	Fail				Operation aborted as span location Indicator gave false reading
11/17/2013	Test	Pass	Pass			Minor delay due to District side gate barrier

Appendix C-2: Daily Draw Bridge Openings 2002 – 2013 (Handwritten Logs)

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
MOODY	9-23-02	10:30 AM								TEST - FOUND SEVERAL PROBLEMS WITH GEMCO SW
MOODY	9-25-02	10:30AM	10:43 AM	TUG BOAT IRELAND					IN BOUND	
MOODY	9-27-02	7:50 AM	8:06 AM	TUG BOAT IRELAND					OUT BOUND	
MOODY	5-13-03	11:AM	11:10 AM							TEST NO RED LIGHTS ANC. SIDE
MOODY	5.20-03	11:20AM	11:55 AM	TUG BOAT					IN BOUND	
MOODY	5-23-03	3:25AM	3:45AM	TUG BOAT APPACHE					OUT BOUND	
LARRY MOODY	6-18-03	10:55AM	11:00AM	COAST GUARD SHIP TENDER					IN	
LARRY MOODY	6-18-03	11:37AM	11:45AM	JAMES RANKIN					OUT	
BILL MOODY	6-26-03	8:45PM	9:10PM	KING POINTER					IN BOUND	NAVY SHIP
BILL MOODY	6-29-03	8:55AM	9:10AM	" "					OUT BOUND	NAVY SHIP
LARRY MOODY	9-4-03	10:55AM	11:20AM	TUG BOAT					IN BOUND	
LARRY MOODY	9-5-03	10:45AM	10:50AM	CASEY CHURCH TUG BOAT					OUT BOUND	
MOODY	10-03-03	3AM	3:17AM	TALL SHIP					IN BOUND	OK
MOODY BILL	10-7-03	8:35AM	9:00PM	TALL SHIP					OUT BOUND	OK
BILL J CARPENTER	03-11-04	11:00AM	11:15AM	TEST						ON COMING SEMI FORE GATE NOT WORKING
" "	3-11-04	11:50AM	12:01PM	TEST						" " " "
BILL CARPENTER	3-15-04	10:00AM	10:15AM	CAPT. RABERSON						" " " "
Maryland carpenter central Bill	19-apr-04	9:58AM	10:14AM	capt. nelson					out Bound	on coming gate not going down
LEAN, CARP. MEEKLY CENTRAL	11/17/04	12:25PM	12:40PM	TEST						
LEAN, STEWART CENTRAL	11/22/04	12:30PM	12:42PM	TEST						
LEAN, STEWART CENTRAL	11/29/04	11:50AM	12:00PM	TEST						
LEAN, SMITH CENTRAL	11/29/04	12:15PM	12:30PM	TEST						
[illegible]	01/13/05	[illegible]	8:14AM	TEST						

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
[illegible], STEWART	3/26/05	7:45 AM	7:55 AM	TEST						CENTRAL
"		8:05 AM	8:15 AM	TEST						"
[illegible]RT, McNeely, Helton	4-30-05	8:01 AM	8:15 AM	TEST						CENTRAL
[illegible]N, Autrey										
[illegible]ewart, McNeely, Helton		12:05	12:09	Test						
[illegible]kson, Taylor Steve	5/18/05	12:10	12:20	Test						
[illegible]nday, Mark Schorder		12:29	12:39	"						
[illegible]trey " "	"									
[illegible]ewart, McNeely,										
[illegible]kson Steve, Taylor	5/19/05	1:47 AM	2:04 AM	YP 684 YP 682	YP 676 YP 688	Coast Guard				Good
[illegible]nday Mark Autrey										
[illegible]elton										
[illegible]ewart, McNeely, Helton	5/23/05	10:04 AM	10:18 AM	YP 684, YP 682,	YP 676, YP 688					
[illegible]kson, Steve, Taylor										
[illegible]nday Mark										
[illegible]wart McNeely Helton	6/11/05	8:40	8:52	Test						
[illegible], Steve Peteschorder										

DAILY REPORT OF DRAW OPENINGS

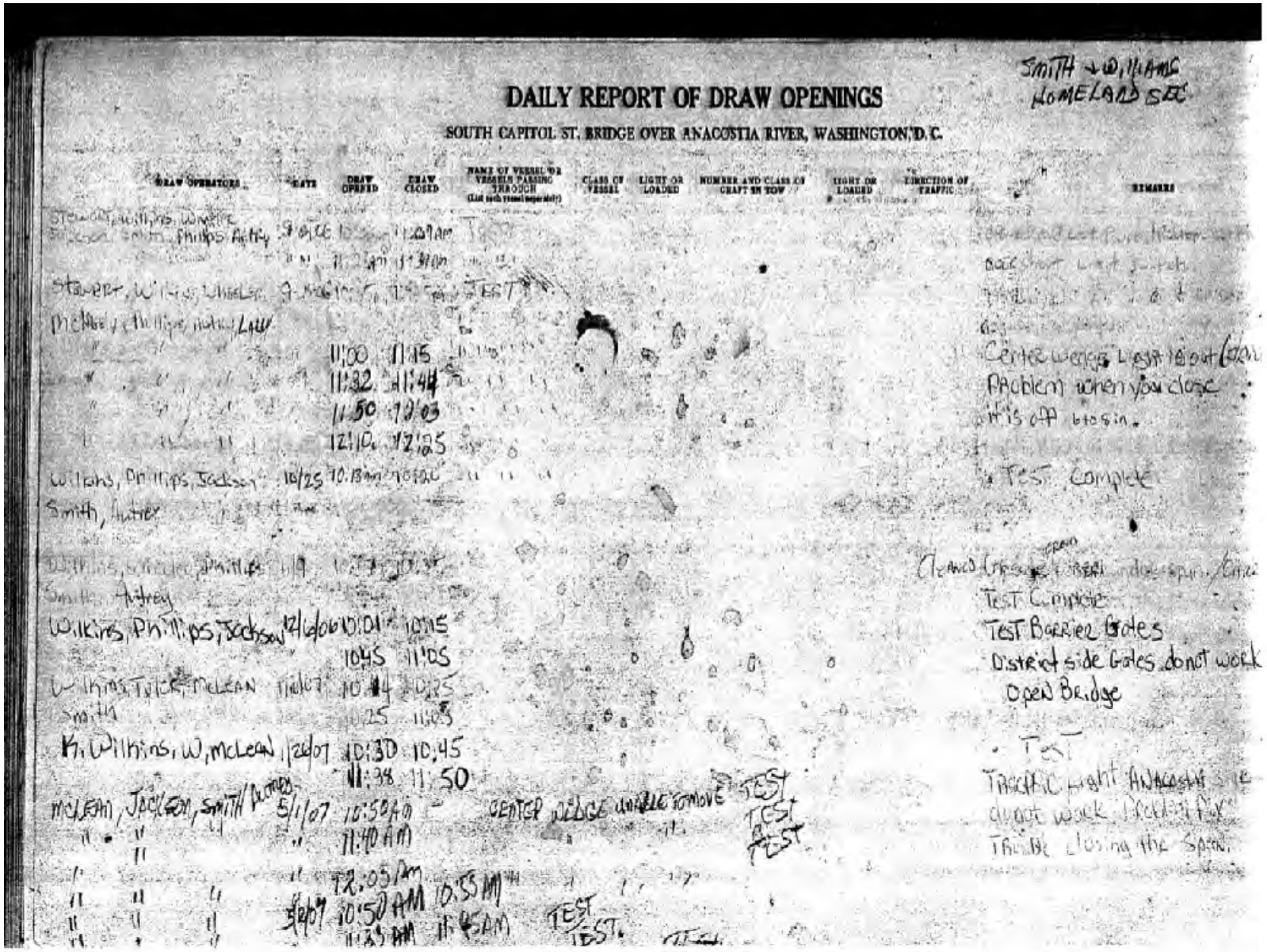
SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D.C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
Stewart, McNeely, Taylor	7-23-05	7:35	7:42	Test						Limit switch Problem
Wilkins, Helton, Baldwin,	" "	" "	" "							For Span Drive
Schroder	" "	7:59	8:13							
McNeely, Stewart, Taylor,	8-1-05	11:01	11:04	Test						Switch Span Drive From
Wilkins, Jackson, Helton,		11:23	11:28	" " "						A to B, Both Used
Monday, Schroder, Autry										
McNeely, Stewart, Taylor,	9/24/05	7:20A	7:33A	"Test"						Problem with Bridge
Wilkins, Jackson, Helton	9/24/05	7:43A	7:53A	"Test"						~~Gave~~ Did not open
Wheeler, Phillip, Autry.										
Stewart, Autry, Schroder	9/29/05	10:57A	11:05A	Test						Breaking and Testing Limit
" " " " "	" "	11:15A	11:26A	Test						switches - Used Both Drive
" " " " "	9-29-05	1:10P	1:20P	" "						Spans A+B. Checked for Broken
										Limit switch
Taylor, Stewart, Wilkins McNeely	10/29/05	7:34AM	7:36AM	Test						
Wheeler, Phillips, Helton Baldwin	10/29/05	7:36AM								No Power to Span Drive Motor
Stewart, Baldwin, Autry, Cox	11/3/05	11:16A	11:21A	Test						Did Not open
Helton, McNeely		12:13P	12:25P	" "						Bridge Did open
Helton, McNeely, Autry, Cox, Jones	11/3/05	9:36A	10:35A	Test						Removed Span Brake Motor for
Taylor										Repair

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
Stewart, Helton, McNeely, Autry, Jim	2/02/07	11:19		Test						
Helton, Stewart, Taylor, Phillips, Autry	5/31/06			TEST						Could Not OPEN Bridge problem with Control mechanism
Stewart, Baldwin, Autry	6-2-06	11:27am	11:37am	TEST						Limit control arm was not set properly. switched to Both sparks A+B
Taylor, Wilkins, Phillips	" "	12:09pm	12:21pm	TEST						(opened with no problem)
Jackson	" "	1:24pm	1:33pm	TEST						
Stewart, Helton, Wilkins, Baldwin, Autry	6-3-06	6:40 Am	6:47 Am	TEST						OPENED with no problem
Stewart, McNeely, Autry, Helton, Baldwin, Blevins, Taylor, Wilkins	6-4-06	3:22pm	3:42pm	AMERICAN SPIRIT						OPENED with no problem
Stewart, Wilkins, Phillips, Taylor, Jackson, Taylor, Autry, Schrader	6-8-06	11:55am	12:05	TEST						
Stewart, Wilkins, Taylor, Phillips, Autry	8-30-06	10:24Am 10:50	10:36Am 11:06Am	TEST " " "						Railroad Gates did not work Put in Bypass. No power to the Toggles. SAME problem.



SMITH + WILLIAMS
HOMELAND SEC

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D.C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
Stewart, Wilkins, Wheeler, Smith, Phillips, Autrey	9/6/06		11:09AM							
		11:31AM	11:31AM							
Stewart, Wilkins, Wheeler	9/6/06			TEST						
McNee, Phillips, Autrey, Lally		11:00	11:15							
		11:32	11:44							
		11:50	12:03							
		12:10	12:25							
Wilkins, Phillips, Jackson	10/25	10:13am	10:52AC							
Smith, Autrey										
Wilkins, Wheeler, Phillips	11/9									
Smith, Autrey										
Wilkins, Phillips, Jackson	12/6/06	10:01	10:15							
		10:45	11:05							
Wilkins, Jack, McLean	11/6/07	10:14	10:25							
Smith		11:25	11:03							
K. Wilkins, W. McLean	12/6/07	10:30	10:45							
		11:38	11:50							
McLean, Jackson, Smith, Phillips	5/1/07	10:50AM		CENTER WEDGE UNABLE TO MOVE						TEST TEST TEST
		11:40AM								
		12:05pm								
	5/8/07	10:50AM	10:55AM							
		11:35AM	11:45AM	TEST TEST.						

Center wedge left about 6 inch
Problem when you close
it is off 6 to 8 in.

TEST Complete

Cleared (from TRAFFIC) drawspan, Circ
Test Complete
Test Barrier Gates
District side Gates donot work
Open Bridge

TEST
Traffic light Anacostia side
donot work Pick-up Pax
Trouble closing the Span.

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
MCLEAN/AUTREY	5/02/07	1230AM	1238AM	TEST						DACOMING GATE BUIB-UP TEP 2 RAILROAD GATE

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D.C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (Use each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
Cornelious Phillips, Keith Wilkins, Robert McNeely, Keane Wheeler, Robert Taylor	4-26-09	5 AM	5:23 AM							Test Complete
Keane Wheeler, Robert Taylor, Keith Wilkins, Robert McNeely, Gregory Smith	5/17/09	5:14 AM	5:16 AM							Brakes problem. Barriers Automatic & D.C. Barriers would not closed. Bridge Closed 5:23 AM
Keith Wilkins, R. Taylor, R. McNeely, L. Smith	6/2/09	4 AM	5:35 AM							Brake problem. District toggles no light for drive-pull Fill line / [illegible]
K. Wheeler, K. Wilkins, R. McNeely, G. Jackson	6/21/09	4:00 AM	4:29 AM							Test Complete
K. Wilkins, K. Wheeler, R. Taylor, R. McNeely, C. Phillips	7/12/09	4:00 AM	4:20 AM							Test Complete
K. Wilkins, R. Taylor, R. McNeely, K. Wheeler, M. Dawkins	8/2/09	4:00 AM	4:20 AM							
K. Wilkins, R. Taylor, K. Wheeler, L. Jackson	9/3/09	4 AM	-							TEST COMPLETE

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
[illegible]										
[illegible]										
[illegible]										
Kenne Wrelin										
Robert Taylor, Michael Parking, Julius Taylor	10-3-16									
Robert Taylor, Larry Smith, Julius Taylor, Robert Mcneely, Gary Jackson	11-14-16									
[illegible]										

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (Use each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
[illegible]	[illegible]	[illegible]	[illegible]							Did not close [illegible] to let traffic at [illegible]
[illegible] Jackson Harry L. Jackson [illegible]	7-11-10	[illegible]	[illegible]							Had problem with the [illegible] gate [illegible] could not open to open span bridge did not open [illegible] [illegible]
7-25-10 5:12 PM	Larry R Smith Michael Dawkins Robert Taylor Robert McNally									
8-15-10	Robert Taylor Robert McNally Tensly Simpson									8-15-10 Gate No 5 Had a problem

DAILY REPORT OF DRAW OPENINGS

SOUTH CAPITOL ST. BRIDGE OVER ANACOSTIA RIVER, WASHINGTON, D. C.

DRAW OPERATORS	DATE	DRAW OPENED	DRAW CLOSED	NAME OF VESSEL OR VESSELS PASSING THROUGH (List each vessel separately)	CLASS OF VESSEL	LIGHT OR LOADED	NUMBER AND CLASS OF CRAFT IN TOW	LIGHT OR LOADED	DIRECTION OF TRAFFIC	REMARKS
Robert Taylor	12-5-10	4:34 AM	4:52 AM							Rolling barrier on dist side would not open had to go to bypass
~~Robert Taylor~~	~~1-1-11~~									Chain broken at dist side had to bypass
Robert Taylor	1-4-11	4:10 AM	4:25 AM							
C. Phillips, J. Taylor, L. Silva, Richard Kennedy	02-07-11	[illegible]	4:40 am							Anacostia barrier came up press on coming both 2 were by pass
[illegible]	3-6-11	4:10 am	5:03 am							
LARRY SMITH	4-3-11									Lower side interlock not working check all lights
Robert Taylor	4-3-11	4:50								
Michael Jenkins	[illegible]	[illegible]								

Appendix D: Minutes from DDOT Meeting with US Coast Guard (12.17.2013)

Meeting Minutes

Group Title: South Capitol Street Corridor		
Meeting Title: South Capitol Street - Navigation Study Next Steps - FAP 8888 (286)		
Date: December 17, 2013	**Time:** 11:00 AM	**Location:** Room 406
Attendees: Sanjay Kumar (DDOT); EJ Simie (DDOT); Konjit Eskender (DDOT); Stephanie Morrison (USCG); Waverly Gregory (USCG); Jessica Shea (USCG); Carolyn Washburn (CH2M HILL); Chris Conroy (CH2M HILL); Jim Moorcroft (CH2M HILL); Brian McMahon (PB); Said Cherifi (PB); Greer Gillis (PB)		
Toll-free dial-in number (U.S. and Canada): (866) 203-7023 **Conference code:** 641-380-3059		

Meeting Minutes

1. Meeting Purpose

The purpose of the meeting was to review the responses to the preliminary public notice, discuss comments on the phase 1 navigation study, provide the preliminary results of the phase 2 navigation study and discuss the next steps for a draft bridge permit application.

2. Status of Preliminary Public Notice

The USCG confirmed that they had not received any responses to the preliminary public notice. They noted that the US Navy had telephoned to confirm that the most recent letter from Admiral Ratti provides their current response. The USCG confirmed that this most recent letter sufficiently documented their current navigational needs for the waterway.

The USCG agreed to provide DDOT with a letter summarizing the status of the preliminary public notice.

The USCG noted that although the preliminary public notice is helpful as it can provide an early capture of issues to be addressed, it is not the final notice. The final notice will be tied into the bridge permit application.

The USCG stated that it is difficult to know if there would be any comment on a final public notice, they would expect that at a minimum the US Army Corps of Engineers, District Department of the Environment and US Navy would all comment.

3. Preparation and Review of Bridge Permit Application

The USCG confirmed that they are able to provide an early review of draft bridge permit application, however noted that this would be incomplete until after issue of the ROD. Also, the 10 month window for the bridge permit application will only start once all documentation is complete.

4. Comments on Phase 1 Navigation Study Report

The USCG noted that the phase 1 Navigation Study provided a very thorough analysis, and they considered it sufficient to support a final bridge permit application. The USCG asked that further analysis be included in the report to include the future development needs of marinas, and adja-

cent land development upstream of the bridge. DDOT confirmed this would be included in the Phase 2 report. The USCG would provide any additional comments through Jessica Shea.

5. Status of Phase 2 Navigation Study Report

PB provided a summary of the results of the phase 2 navigation study. 5000 vessel transits were recorded by the real time video monitoring, all of which supported the results of the phase 1 navigation study. DDOT confirmed that during the period of the study the bridge had been opened only once for maintenance purposes.

6. Next Steps

See action items below.

USCG requested that DDOT discuss the draft bridge permit application with FHWA so that they understand its status as a draft, awaiting the completion/approval of the environmental documentation.

ACTION ITEMS

	Date	Action	Action by	Status
1.	12/17/2013	Provide a letter summarizing the responses to the preliminary public notice	USCG	Complete - attached
2.	12/17/2013	Compile draft bridge permit application for review by USCG	DDOT	First quarter 2014
3.	12/17/2013	Review/clarify land use and future marina developments upstream of the bridge in the phase 2 navigation study report.	DDOT	To be issued January 2014
4.	12/17/2013	Provide Phase 2 Navigation Study to USCG	DDOT	To be issued January 2014

Attachments: USCG Letter to DDOT (Dated December 19, 2013)

Appendix E: Preliminary Public Notice 5-1317

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, VA 23704-5004
Staff Symbol: dpb
Phone: (757) 398-6422
Fax: (757) 398-6334
Email: jessica.c.shea2@uscg.mil

16590
19 DEC 2013

Mr. Sanjay Kumar, P.E., Project Manager
District of Columbia Department of Transportation
55 M Street, SE, Suite 400
Washington, DC 20003

Dear Mr. Kumar:

The Fifth Coast Guard District issued a preliminary public notice regarding the proposed replacement of the Frederick Douglass Memorial Bridge (South Capitol Street) over the Anacostia River. The purpose of this notice was to notify mariners, adjacent property owners, and government agencies that the District of Columbia Department of Transportation may propose to replace the current movable drawbridge with a fixed bridge. A copy of this notice is enclosed.

There were no comments provided in response to this preliminary public notice. There will be another opportunity for the public to comment on the proposed bridge design after a bridge permit application is submitted. The requisite public notice that includes a location map and engineering plans will be issued once a complete bridge permit application is received.

I look forward to our continued coordination on this project. Please feel free to contact me or my staff if you have any questions regarding the Coast Guard bridge permit process.

Sincerely,

Waverly W. Gregory, Jr.

WAVERLY W. GREGORY, JR.
Bridge Program Manager
By direction of the Commander
Fifth Coast Guard District

Enclosure: Preliminary Public Notice 5-1317

Copy: Coast Guard Sector Baltimore, Waterways Management
Ms. Carolyn Washburn, CH2M
Mr. Michael Hicks, Federal Highway Administration

U.S. Department of Homeland Security

United States Coast Guard

Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, Va. 23704-5004
Staff Symbol: (dpb)
Phone: (757) 398-6422
Fax: (757) 398-6334
Email: jessica.c.shea2@uscg.mil

16591
4 NOV 2013

PRELIMINARY PUBLIC NOTICE 5-1317

TO WHOM IT MAY CONCERN:

The purpose of this notice is to notify mariners, adjacent property owners, and government agencies that the District of Columbia Department of Transportation (DDOT) proposes plans to replace the Frederick Douglass Memorial Bridge (South Capitol Street) over the Anacostia River.

WATERWAY AND LOCATION: Across the Anacostia River, at mile 1.2, upstream of the confluence with the Potomac River in Washington, D.C. NOAA Chart # 12285.

CHARACTER OF WORK: DDOT is proposing to replace the existing swing-type Frederick Douglass Memorial Bridge (South Capitol Street) over the Anacostia River, with a new fixed bridge at essentially the same location. The replacement project will modify the existing vertical and horizontal clearance of the bridge. Presently, in the closed position to vessels, the charted vertical clearance of the existing swing-type bridge is 40 feet above mean high water (MHW), with unlimited vertical clearance in the full open position. The existing horizontal clearance is two channels of 149 feet each. The proposed replacement will be a fixed bridge that will provide a vertical clearance of 42 feet above MHW, with a proposed horizontal clearance of 150 feet.

It is requested that the Coast Guard be provided with navigational information such as the sizes and types of vessels presently owned and operated on the Anacostia River as they relate to the proposed vertical and horizontal clearances. Please submit the attached form in response to this preliminary public notice.

SOLICITATION OF COMMENTS:

It is further requested that mariners and adjacent property owners express their views from a navigational standpoint, in writing, on the proposed project giving sufficient detail to establish a clear understanding of their reasons for support of or opposition to this project. Comments will be received for the record at the office of Commander (dpb), Fifth Coast Guard District, 431 Crawford Street, Portsmouth, VA 23704-5004 through **3 DEC 2013**.

Waverly W. Gregory, Jr.

WAVERLY W. GREGORY, JR.
Bridge Program Manager
By direction of the Commander
Fifth Coast Guard District

Frederick Douglass Memorial Bridge (South Capitol Street) over the Anacostia River

Preliminary Public Notice

Response Form

It is requested that anyone having an interest in this proposed project, from the standpoint of navigation, submit vessel information, comments, and recommendations on this form to the Office of Commander (dpb), Fifth Coast Guard District, 431 Crawford Street, Portsmouth, VA 23704-5004 by **3 DEC 2013**.

Vessel Information	Please provide all requested information:
Vessel Type	
Use – Commercial or Recreational	
Vessel Height	
Draft	
Length	
Beam	
Tonnage	
Mooring Location	

Name (Optional): _____

Address (Optional): _____

Phone (Optional): _____

Comments and Recommendations: _____

_____

_____

_____

_____

District Department of Transportation

appendix B

federal notices

July 2014

submitted by:

PARSONS BRINCKERHOFF

that is permitted only in the appropriate narrow circumstances contemplated by FINRA rules, the Commission notes the high number of cases where arbitrators grant brokers' expungement requests. When information is expunged from the CRD, it is no longer available to regulators, broker-dealers, or the investing public. Both regulators and the investing public are disadvantaged when factual information is removed from the CRD.[54] The Commission encourages FINRA to conduct a comprehensive review of its expungement rules and procedures to determine whether additional rulemaking is necessary or appropriate to assure that expungement in fact is treated as an extraordinary remedy that is permitted only where the information to be expunged has no meaningful investor protection or regulatory value.

For the reasons discussed above, the Commission finds that the proposed rule change is consistent with the Act.

V. Conclusion

It is therefore ordered, pursuant to Section 19(b)(2) of the Act,[55] that the proposed rule change (SR–FINRA–2014–020), be, and hereby is, approved.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.[56]

Kevin M. O'Neill,

Deputy Secretary.

Exhibit A—List of Comment Letters Received for SR–FINRA–2014–020

1. Steven B. Caruso, Maddox Hargett Caruso, P.C., dated April 21, 2014 (''Caruso'')
2. Nicole Iannarone, Assistant Clinical Professor, Tim Guilmette, Student Intern, and Nataliya Obikhod, Student Intern, Georgia State University College of Law, dated May 1, 2014 (''GSU'')
3. Philip M. Aidikoff, Aidikoff, Uhl and Bakhtiari, dated May 1, 2014 (''Aidikoff'')
4. Ryan K. Bakhtiari, Aidikoff, Uhl and Bakhtiari, dated May 5, 2014 (''Bakhtiari'')
5. Richard P. Ryder, dated May 5, 2014 (''Ryder'')
6. Leonard Steiner, Steiner & Libo, PC, dated May 6, 2014 (''Steiner'')
7. Barry D. Estell, dated May 7, 2014 (''Estell'')
8. George H. Friedman, George H. Friedman Consulting, LLC, dated May 13, 2014 (''Friedman'')
9. Jason Doss, President, Public Investors Arbitration Bar Association, dated May 13, 2014 (''PIABA'')
10. David T. Bellaire, Executive Vice President and General Counsel, Financial Services Institute, dated May 14, 2014 (''FSI'')
11. Andrea Seidt, North American Securities Administrators Association (''NASAA'') President and Ohio Securities Commissioner, dated May 14, 2014 (''NASAA'')
12. Jill Gross, Director, Elissa Germaine, Supervising Attorney, and Michelle N. Robinson, Student Intern, John Jay Legal Services, Inc., Pace University School of Law, dated May 14, 2014 (''Pace'')
13. Kevin M. Carroll, Managing Director and Associate General Counsel, Securities Industry and Financial Markets Association, dated May 14, 2014 (''SIFMA'')
14. Ronald M. Amato, Amato Law Firm, LLC, dated May 15, 2014 (''Amato'')
15. Harry A. Jacobowitz, Database Manager, Securities Arbitration Commentator, Inc., dated May 16, 2014 (''Jacobowitz'')

[FR Doc. 2014–17614 Filed 7–25–14; 8:45 am]

BILLING CODE 8011–01–P

[54] Indeed, Section 15A(i) of the Act requires FINRA to collect and make available ''information reported in connection with the registration or licensing of brokers and dealers and their associated persons, including disciplinary actions, regulatory, judicial, and arbitration proceedings, and other information required by law or exchange or association rule, and the source and status of such information. *See* 15 U.S.C. 78*o*–3(i)(5).

[55] 15 U.S.C. 78s(b)(2).

[56] 17 CFR 200.30–3(a)(12).

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Supplemental Final Environmental Impact Statement; Washington, DC

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent to Prepare a Supplemental Final Environmental Impact Statement (SFEIS).

SUMMARY: The U.S. Federal Highway Administration (FHWA) in coordination with the District of Columbia Department of Transportation (DDOT) in Washington, DC is issuing this notice to advise agencies and the public that a Supplemental Final Environmental Impact Statement (SFEIS) will be prepared for the South Capitol Street Project (the Project). The Project proposes to make major changes to the South Capitol Street Corridor from Firth Sterling Avenue SE to Independence Avenue and the Suitland Parkway from Martin Luther King, Jr. Avenue SE., to South Capitol Street, including replacing the existing Frederick Douglass Memorial Bridge over the Anacostia River.

FOR FURTHER INFORMATION CONTACT: Federal Highway Administration, District of Columbia Division: Mr. Michael Hicks, Environmental/Urban Engineer, 1990 K Street NW., Suite 510, Washington, DC 20006–1103, (202) 219–3513, email: *michael.hicks@dot.gov*; or the District of Columbia Department of Transportation: Mr. E.J. Simie, PE, Project Manager, 55 M Street SE., Suite 400, Washington, DC 20003, (202) 671–2800, email: *ej.simie@dc.gov*.

SUPPLEMENTARY INFORMATION: In March 2011, the FHWA in conjunction with DDOT approved release of the Final Environmental Impact Statement (FEIS) for the Project. The availability of the FEIS was announced in the April 8, 2011 **Federal Register**. The alternatives examined in detail in the FEIS included a No Build Alternative and three build alternatives: Build Alternatives 1 and 2 and the Preferred Alternative, which was a modification of Build Alternative 2. A movable arched bascule was selected for the new Frederick Douglass Memorial Bridge. The alignment of the new bridge would be at an angle from the existing bridge to allow the swing span on the existing bridge to remain operational during construction, which meant that right-of-way would be needed from Joint Base Anacostia-Bolling (JBAB). Build Alternatives 1 and 2 were eliminated from consideration in the FEIS and, therefore, will not be considered in the SFEIS.

Since publication of the FEIS, FHWA and DDOT have considered major changes regarding the design of the FEIS Preferred Alternative. Most notably, DDOT reconsidered the need to obtain right-of-way from JBAB, which resulted in changing the alignment of the proposed new Frederick Douglass Memorial Bridge to a location immediately south of and parallel to the existing bridge. In addition, new information about current and planned navigation along the Anacostia River, including the navigation requirements of the U.S. Navy (USN), led to the decision to make the new bridge a fixed span structure instead of a movable span structure. Other notable design revisions made to the FEIS Preferred Alternative include the conversion of the east side traffic circle to a traffic oval similar in size to the proposed west traffic oval, and changes to the proposed ramps or ramp modifications between South Capitol Street and I–695, Suitland Parkway and I–295, and Martin Luther King, Jr. Avenue SE. and Suitland Parkway. Due to these and other design changes, a Revised Preferred Alternative was developed.

The SFEIS will be prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4371, *et seq.*), Council on Environmental Quality (CEQ) regulations (40 CFR parts 1500–1508), FHWA Code of Federal Regulations (23 CFR 771.101–771.137, *et seq.*), and all

applicable Federal, State, and local government laws, regulations, and policies. The SFEIS will describe the proposed changes to the FEIS Preferred Alternative, update the affected environment, and describe the anticipated environmental impacts of the Revised Preferred Alternative in comparison to the anticipated environmental impacts disclosed in the FEIS for the FEIS Preferred Alternative. The Purpose and Need of the Project did not change from the FEIS. The U.S. Navy; U.S. Army Corps of Engineers; U.S. Coast Guard; the National Park Service; and the District of Columbia Department of the Environment will continue to serve as Cooperating Agencies for the Project.

A 30-day review period will be provided following the Notice of Availability of the SFEIS in the **Federal Register**, and a public meeting will be held within this review period. The public meeting will be conducted by DDOT and announced a minimum of 15 days in advance of the meeting. DDOT will provide information for the public meeting, including date, time and location through a variety of means including the Project Web site (*http://www.southcapitoleis.com*) and by newspaper advertisement.

To ensure that the full range of issues is identified early in the process, comments are invited from all interested and/or potentially affected parties. Comments or questions concerning this Notice should be directed to the FHWA and DDOT at the addresses provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205 Highway Planning and Construction. The regulations and implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Authority: 23 U.S.C. 315; 49 CFR 1.48.

Issued on: July 23, 2014.

Joseph C. Lawson,

Division Administrator, District of Columbia Division, Federal Highway Administration.

[FR Doc. 2014–17679 Filed 7–25–14; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

Reports, Forms and Record Keeping Requirements; Agency Information Collection Activity Under OMB Review

AGENCY: National Highway Traffic Safety Administration (NHTSA), U.S. Department of Transportation (DOT).

ACTION: Notice.

SUMMARY: In compliance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.), this notice announces that the Information Collection Request (ICR) abstracted below has been forwarded to the Office of Management and Budget (OMB) for review and comment. The ICR describes the nature of the information collections and their expected burden. The **Federal Register** Notices with a 60-day and a 30-day comment period were published on February 27, 2012 (77 FR 11626) and on December 23, 2013 (78 FR 77554), respectively. No comments were received on this matter.

This document describes the collection of information for which NHTSA intends to seek OMB approval. The collection of information described is the ''Consolidated Child Restraint System Registration, Labeling and Defect Notification.'' (OMB Control Number: 2127–0576)

DATES: Comments must be submitted on or before August 27, 2014.

FOR FURTHER INFORMATION CONTACT: Ms. Cristina Echemendia at U.S. Department of Transportation, NHTSA, 1200 New Jersey Avenue SE., West Building Room W43–447, NVS–113, Washington, DC 20590. Mrs. Cristina Echemendia's telephone number is (202) 366–6345 and fax number is (202) 366–7002.

SUPPLEMENTARY INFORMATION:

National Highway Traffic Safety Administration

Title: Consolidated Child Restraint System Registration, Labeling and Defect Notifications.

OMB Control Number: 2127–0576.

Type of Request: Label revision of a currently approved collection.

Abstract: A final rule published on February 27, 2012 (77 FR 11626) amended the Federal motor vehicle safety standard for child restraint systems (CRSs) to expand its applicability to child restraints sold for children weighing up to 80 pounds (lb). The final rule also added a sentence to the printed instructions and labeling of certain CRSs (those that have internal harnesses, and that are recommended for older children). Currently, child restraint manufacturers are required to provide printed instructions with step by-step information on how the restraint is to be used. Without proper use, the effectiveness of these systems is greatly diminished. Each CRS must also have a permanent label.[1] A permanently attached label gives ''quicklook'' information on whether the restraint meets the safety requirements, recommended installation and use, and warnings against misuse. The requested revision is to add a sentence to the existing instructions brochure and labeling that will inform the consumer that the lower anchors of a Lower Anchors and Tethers for Children (LATCH) system may only be used for children weighing ''x'' lb or less, where the ''x'' value depends on the weight of the CRS. The purpose of this label is to reduce consumer confusion about using LATCH, and to assure that the lower anchors will be able to withstand the forces generated by the child and CRS in virtually all crashes.

Under the final rule, CRSs equipped with internal harnesses to restrain the child and with components to attach to a child restraint anchorage system, will be required to be labeled with a child weight limit for using the lower anchors to attach the child restraint to the vehicle. The child weight limit depends on the weight of the CRS.

On February 25, 2014 the agency published a final rule responding to petitions for reconsideration (79 FR 10396) of the February 2012 final rule. The petitions stated, among other things, that the label that was required by the 2012 rule was unclear and could be misunderstood. In response, NHTSA made minor adjustments to the labeling requirement to make it clearer and more reader friendly.

NHTSA anticipates a change to the hour burden or costs associated with the revised child restraint labels and written instructions. Child restraint manufacturers produce, on average, a total of approximately 4,500,000 child restraints per year. The label would apply to approximately 50 percent of the total annual production (2,250,000 units). The hour burden associated with the revised label consists of the child restraint manufacturer: (1) Determining the maximum allowable child weight when using the lower anchor attachments as a means of installation and (2) adding this information on an existing label and instruction manual. We estimate 2 seconds of additional burden per child restraint for the determination of the maximum allowable weight and the addition of the information on the existing label and instruction manual (2 seconds × 2,250,000 units = 4,500,000 seconds = 1,250 hours).

[1] FMVSS No. 213 also requires child restraint manufacturers to provide owner-registration cards and to keep records relating to owner registration information, so that owners can be notified about noncompliance or defect recall campaigns. These owner registration requirements are not affected by the final rule (77 FR 11626).

District Department of Transportation

appendix C

air quality technical report

october 2014

submitted by:

PARSONS BRINCKERHOFF

FINAL AIR QUALITY TECHNICAL REPORT

October 2014

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Appendices

Appendices are located on attached CD.

Appendix A MOVES2010 Files
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1.0 Introduction

The District of Columbia Department of Transportation (DDOT), in cooperation with the Federal Highway Administration (FHWA), is proposing to replace the Frederick Douglass Memorial Bridge, reconstruct connecting roadways and interchanges, and add streetscape features in the South Capitol Street project area. This proposed action would improve safety, multimodal mobility, and accessibility, and support economic development.

A Supplemental Draft Environmental Impact Statement (SDEIS) is being prepared to examine the proposed changes to the South Capitol Street Project (the Project) as described in the Final Environmental Impact Statement (FEIS) released in March 2011. Decisions about the Project made since approval of the 2011 FEIS resulted in major changes to the design of the project. The most notable decision was to reconsider obtaining right-of-way within the northernmost portion of the Joint Base Anacostia Bolling (JBAB) for the Project. This decision resulted in additional engineering to set the proposed new Frederick Douglass Memorial Bridge on an alignment immediately south of and parallel to the existing bridge. In addition, new information about current and planned navigation, including the navigation requirements of the U.S. Navy along the Anacostia River influenced the decision to include a fixed bridge among the Project alternatives.

As part of the Draft Environmental Impact Statement (DEIS) finalized in 2008, an Air Quality Technical Report was completed in 2007. The 2007 Air Quality Technical Report documented the evaluation of the Project's feasible alternatives and determined the project's impact on air quality based on those alternatives. Additionally, an air quality analysis was conducted in 2010 to support the findings of the 2011 FEIS.

This report presents the results of the updated air quality impact assessment performed for the Revised Preferred Alternative to be addressed in the SDEIS. This report:

- Describes the Project and project area.
- Identifies the air pollutants associated with motor vehicle exhaust.
- Reviews applicable standards, regulations, and local meteorology.
- Summarizes existing air quality monitored data that are representative of ambient conditions in the project area.
- Summarizes the Project's impact on local air quality.

1.1 Setting

South Capitol Street was a primary corridor in L'Enfant's 1791 Plan for the City of Washington and has always been envisioned as a symbolic gateway to the city and its Monumental Core. South Capitol Street connects downtown Washington to neighborhoods in the southeast and southwest quadrants of the District of Columbia and Prince George's County, Maryland.

Today, South Capitol Street lacks any characteristics of its historic function as a gateway and the street's present characteristics and conditions are not appropriate to its central

place and important function. South Capitol Street is an urban freeway that has become a conduit for through traffic at the expense of serving the immediate needs of the residents and businesses in the corridor. The transportation infrastructure is in deteriorating condition and fails to provide necessary connections to community destinations for pedestrians, bicyclists, transit riders, or motorists.

Despite the inadequacies of the transportation infrastructure in the corridor, new development is rapidly transforming former industrial and military uses into thriving mixed use communities and employment centers. Public investment is focused on new developments. This public investment has stimulated private investment in new residential, office, and retail developments throughout the corridor. The economic development of the South Capitol Street Corridor and along the Anacostia River is part of a District of Columbia and regional effort to revitalize the waterfront and clean up the river. The vision for the Anacostia Waterfront is an area that will unite the city economically, physically, and socially as the center of 21st century Washington and a cornerstone of the National Capital Region. South Capitol Street's transportation infrastructure must support and enhance this new vision of the Anacostia Waterfront.

With this vision in mind, DDOT in cooperation with FHWA is analyzing a range of alternatives for addressing safety, multimodal mobility, accessibility issues, and economic development in the South Capitol Street corridor.

1.2 Purpose and Need

The purpose of the South Capitol Street project is to improve safety, multimodal mobility, accessibility, and support economic development. Specifically, the project addresses the following needs:

- **Safety:** The design and deteriorating condition of the transportation infrastructure in the corridor creates safety concerns for motorists, bicyclists, pedestrians, and transit riders.
- **Mobility:** Missing critical regional roadway connections and the lack of facilities for bicyclists and pedestrians, establish the need to improve multimodal mobility in the South Capitol Street Corridor.
- **Accessibility:** There are several key destinations in or adjacent to the corridor, but these locations are difficult to reach using the existing transportation infrastructure. Grade separations, median barriers, and ramp and intersection configurations limit access to activity centers for motorists, bicyclists, pedestrians, and transit riders.
- **Economic Development:** The density of employment and residential development forecasted for the area demonstrate the need to support economic growth. Public-driven development will add jobs and create new residential neighborhoods.

1.3 Project Area

The South Capitol Street project area is located in the Southwest and Southeast quadrants of the District of Columbia adjacent to the Anacostia River (Figure 1). The northern boundary is at D Street at the US Capitol. The eastern boundary follows 2nd Street SE west of the Anacostia River and expands to the east of the Anacostia Metrorail station parking deck north of Interstate 295 east of the river. The western boundary is just west of 2nd Street from Independence Avenue SW from to T Street SW north of the Anacostia River and Mitscher Road SW in the Anacostia Naval Station. The southern boundary of the project area is just south of the Barry Farms neighborhood (near the intersection of Wade and Stevens Roads SE) and includes a portion of St. Elizabeths West Campus.

1.4 No-Build and Preferred Alternative

1.4.1 No Build Alternative

The No Build Alternative for the South Capitol Street Project consists of the existing street conditions and transportation projects that will be completed by the design year 2040 within the project area. The No Build Alternative does not meet the Project purpose and need and therefore is not evaluated in the SDEIS.

1.4.2 Overview of Build Alternatives in the FEIS

As described in Chapter 2 of the FEIS, the alternatives development process for the Project consisted of four iterations of alternatives: the Initial Build Alternatives; the Preliminary Build Alternatives; the Build Alternatives evaluated in the DEIS; and the Build Alternatives evaluated in the FEIS. Each iteration of alternatives development included consideration of planning, engineering, and environmental input with public and agency comments. All of the build alternatives included a new bridge to replace the existing Frederick Douglass Memorial Bridge, with an alignment that slanted or skewed from the existing bridge alignment. The rationale for this skewed bridge alignment, in part, was to provide adequate clearance for operating the swing-span on the existing bridge during the new bridge construction. The Build Alternatives of the FEIS only included a movable type bridge for the replacement.

1.4.3 Revised Preferred Alternative Description

The Revised Preferred Alternative presented in the SDEIS incorporates the design changes based on evaluations in the project area. For descriptive purposes, the proposed design changes to the Project are described by segments numbered 1 through 5 (Figure 2). Segment 1 includes the area over the Anacostia River, including the riverside areas immediately west and east of the river. Segment 2 includes I-295, but also the area where Suitland Parkway connects with South Capitol Street. Segment 3 includes Suitland Parkway east of Firth Sterling Avenue. Segment 4 includes South Capitol Street on the west side of the river from M Street to D Street, SE. Segment 5 encompasses the areas north of I-695 to Independence Avenue, but also includes New Jersey Avenue SE between M Street SE and D Street, SE.

Figure 1: Project Study Area

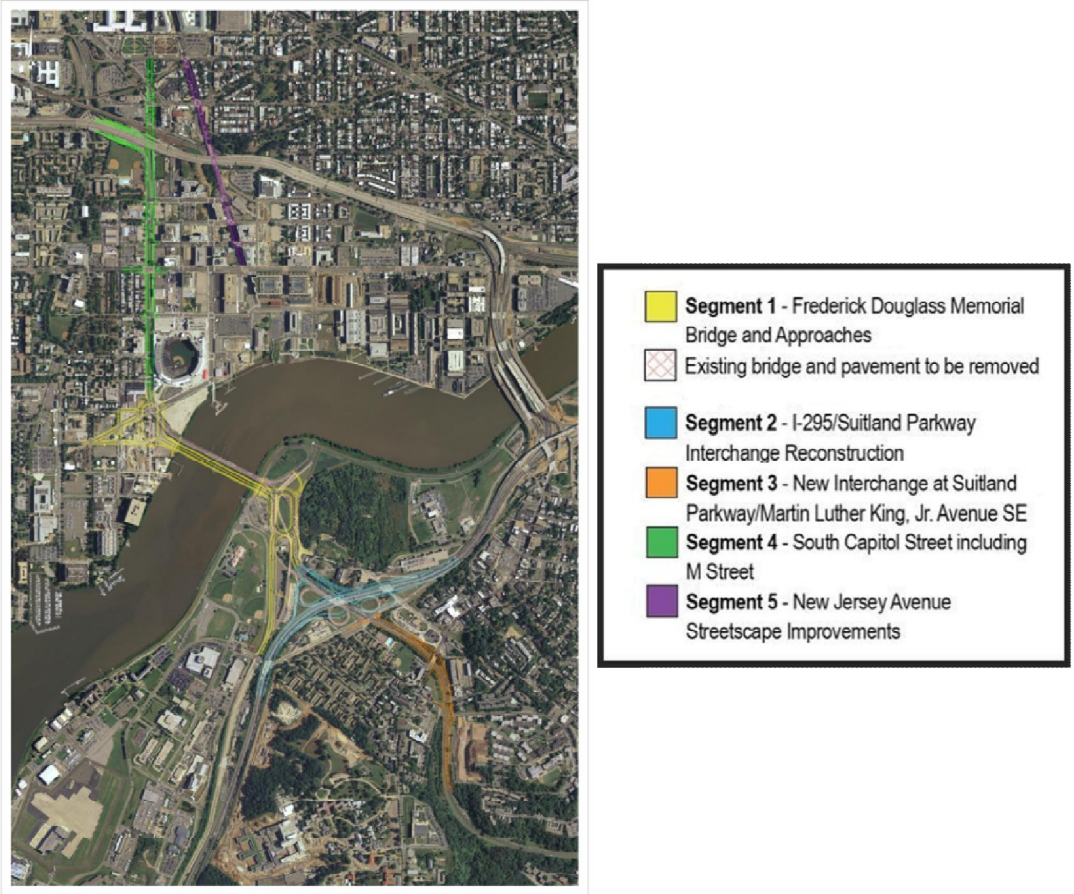


Figure 2: Segments of the South Capitol Street Project

1.4.4 Segment 1

Segment 1 encompasses the Anacostia River and the land areas immediately on both the west (near the Nationals Ballpark and Buzzard Point) and east (near Anacostia and Poplar Point) ends of the river. This segment includes the new Frederick Douglass Memorial Bridge.

The proposed new bridge alignment of the Revised Preferred Alternative would be located parallel to and approximately 30 feet from the south side or downstream from of the existing bridge superstructure. Similar to FEIS Preferred Alternative, the new proposed bridge under the Revised Preferred Alternative would support six travel lanes (three lanes in each direction), and bike/pedestrian paths. The bike/pedestrian paths would be located on opposite sides of the bridge, the same as what was proposed for the FEIS Preferred Alternative. However, each path would be approximately 18 feet wide, or two feet narrower than what was proposed in the FEIS. For each path, separate areas would be provided for cyclists and pedestrians. For cyclists, both paths would provide for two-way traffic.

The west end traffic oval was slightly reduced in size and would no longer require land from the Nationals Ballpark sidewalk and Reservation 245. The oval would still connect South Capitol Street, the new bridge, Potomac Avenue, G Street SW and R Street SW. On the west end of the bridge near the oval, the design could allow staircases to connect with the riverfront on both the north and south sides of the bridge.

The re-alignment of the proposed bridge necessitated a redesign of the traffic circle on the east end of the river to a traffic oval similar in size and scale to the traffic oval proposed on the west side of the river. The intention is to aesthetically match both the west and east end ovals. The east oval would be located completely within the DDOT right of way, and it would still allow connections between the new Frederick Douglass Memorial Bridge, and realigned South Capitol Street and Suitland Parkway.

Unlike the traffic circle proposed under the FEIS Preferred Alternative, the east traffic oval in the Revised Preferred Alternative would not directly connect~~ion~~ with Howard Road in the near term. Instead, the initial configuration of Howard Road would connect directly with Suitland Parkway. The east oval would sever the existing access roads into the Poplar Point section of Anacostia Park. To maintain park access, the northeast leg of the east oval would be used for both the park's ingress and egress at Poplar Point.

There are currently two design options for the Frederick Douglass Memorial Bridge. The first option is for a fixed span bridge and the second is for a moveable span.

1.4.5 Segment 2

Segment 2 encompasses I-295 and the area between this freeway and the proposed east traffic oval, including Suitland Parkway and South Capitol Street. The existing I-295 / Suitland Parkway Interchange would be modified from a partial cloverleaf interchange to an urban diamond interchange that would allow all movements between Suitland Parkway and I-295. The east side cloverleaf ramps would be removed and replaced with diamond ramps. A diamond ramp (Ramp B) would be provided for southbound I-295 to eastbound Suitland Parkway movements. The ramp would have a gradient of 6.5 percent to be within highway standards. The interchange modification would require replacing the I-295 bridge over Suitland Parkway and widening the southbound I-295 bridge over Howard Road SE for a ramp to Suitland Parkway. Suitland Parkway would be reconstructed from Firth Sterling Avenue SE to the proposed traffic circle. Firth Sterling Avenue would be reconstructed from Suitland Parkway to Howard Road SE.

Segment 2 will be completely built upon completion of Segment 3. The section of Suitland Parkway within Segment 2 will consist of three lanes in each direction when fully built. The eastbound side of Suitland Parkway will also have a sidewalk and bike path.

The I-295 bridges over Howard Road SE and Firth Sterling Avenue SE would also be replaced as they have been identified to be in poor condition. The bridge over Firth Sterling Avenue SE is also over an inactive railroad right-of-way owned by CSX Transportation, Inc. (CSX). Instead of bridging over the CSX right-of-way, the right-of-way would be replaced with earthen fill. Therefore, the new I-295 bridge over Firth Sterling Avenue SE would be shorter.

1.4.6 Segment 3

Segment 3 covers Suitland Parkway from Firth Sterling Avenue SE east to just south of Stanton Road SE. Suitland Parkway would be reconstructed from Firth Sterling Avenue SE to the segment of the Parkway just south of Stanton Road SE. This would include removing ramps connecting with Stanton Road SE and Sheridan Road SE. The Martin Luther King Jr. Avenue SE overpass would be converted into an urban diamond interchange where new ramps on both sides of the Suitland Parkway would provide for all possible movements between the Parkway and Martin Luther King Jr. Avenue SE. In addition, a sidewalk/bike path would be provided or upgraded along the north side of the reconstructed Suitland Parkway.

1.4.7 Segment 4

Segment 4 covers South Capitol Street, north of the Anacostia River, from Potomac Avenue to D Street, SE. The South Capitol Street and M Street interchange would be converted to an at-grade intersection with left-turn bays. The intersection work would include reconstruction of M Street SW roughly between Half Street SE and Half Street SW. South Capitol Street from M Street to I Street would be converted into an urban boulevard, with wider sidewalks and modified intersections with L and K Streets to allow cross-street movements. The ramp carrying northbound South Capitol Street traffic to westbound I-695 located just north of the I Street intersection would be removed and replaced with an urban interchange ramp from South Capitol Street that would be located underneath the I-695 Viaduct.

The segment of South Capitol Street north of I Street would be reconstructed due to the elimination of the northbound ramp. The eastbound Southeast-Southwest Freeway off-ramp to southbound South Capitol Street would be modified to an urban interchange ramp with South Capitol Street. The modified ramp would require a signalized intersection with South Capitol Street. It could allow right-of-way occupied by the old ramp to be used for slightly expanding the size of Randall Recreation Center. Other changes to the design include minor modifications to lane configurations along South Capitol Street. An enhanced streetscape, including pedestrian amenities, would be provided on South Capitol Street from I-695 to Independence Avenue.

1.4.8 Segment 5

Segment 5 New Jersey Avenue SE between M Street SE and D Street, SE. An enhanced streetscape would be provided along New Jersey Avenue SE between M Street SE and D Street, SE. Within the segment between M Street SE and I-695, the full 160-foot right-of-way would be restored.

2.0 Affected Environment

Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, or reducing human or animal health.

2.1 Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 (CAAA) and the Final Transportation Conformity Rule (40 CFR Parts 51 and 93) direct the US Environmental Protection Agency (USEPA) to implement environmental policies and regulations that will ensure acceptable levels of air quality.

The Clean Air Act and the Final Transportation Conformity Rule affect proposed transportation projects. According to Title I, Section 176 (c) 2:

> "No federal agency may approve, accept or fund any transportation plan, program or project unless such plan, program, or project has been found to conform to any applicable State Implementation Plan (SIP) in effect under this act."

The Final Conformity Rule defines conformity as follows:

> "Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards; and that such activities will not:
>
> - cause or contribute to any new violation of any NAAQS in any area;
> - increase the frequency or severity of any existing violation of any NAAQS in any area; or
> - delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area."

2.2 National and State Ambient Air Quality Standards

As required by the Clean Air Act of 1970 (CAA), NAAQS have been established for six major air pollutants. These pollutants, known as criteria pollutants, are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

The federal standards are summarized in Table 1. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

Table 1: National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide		primary	8-hour	9ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead		primary and secondary	Rolling 3 month average	0.15 $\mu g/m^3$ (1)	Not to be exceeded
Nitrogen Dioxide		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
Ozone		primary and secondary	8-hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution	$PM_{2.5}$	primary	Annual	12 $\mu g/m^3$	Annual mean, averaged over 3 years
		secondary	Annual	15 $\mu g/m^3$	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA Office of Air and Radiation, http://www.epa.gov/air/criteria.html

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

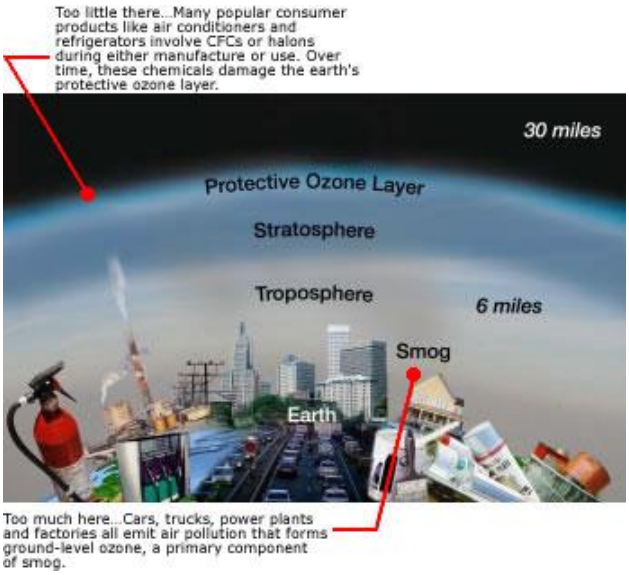
Abbreviations: ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter.

2.3 Criteria Pollutants and Effects

The sources of the criteria pollutants, their effects on human health and the nation's welfare, and their final deposition in the atmosphere vary considerably. A brief description of each of the six pollutants is given below.

2.3.1 Ozone

Ozone (O_3) is a colorless, toxic gas. As shown in Figure 3, O_3 is found in both the Earth's upper and lower atmospheric levels. In the upper atmosphere, O_3 is a naturally occurring gas that helps to prevent the sun's harmful ultraviolet rays from reaching the earth. In the lower layer of the atmosphere, O_3 is man-made. Although O_3 is not directly emitted, it forms in the lower atmosphere through a chemical reaction between reactive organic gases (ROG), also referred to as volatile organic compounds (VOCs), and nitrogen oxides (NOx), which are emitted from industrial sources and from automobiles. As shown in Figure 4 and Figure 5, mobile sources are primary significant source of O_3 precursors (VOCs and NOx) in the Washington D.C. area.



Source: www.epa.gov/oar/oaqps/gooduphigh/good.html

Figure 3: Ozone in the Atmosphere

Substantial O_3 formations generally require a stable atmosphere with strong sunlight, thus high levels of O_3 are generally a concern in the summer. O_3 is the main ingredient of smog. O_3 enters the blood stream through the respiratory system and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. O_3 also damages vegetation by inhibiting its growth.

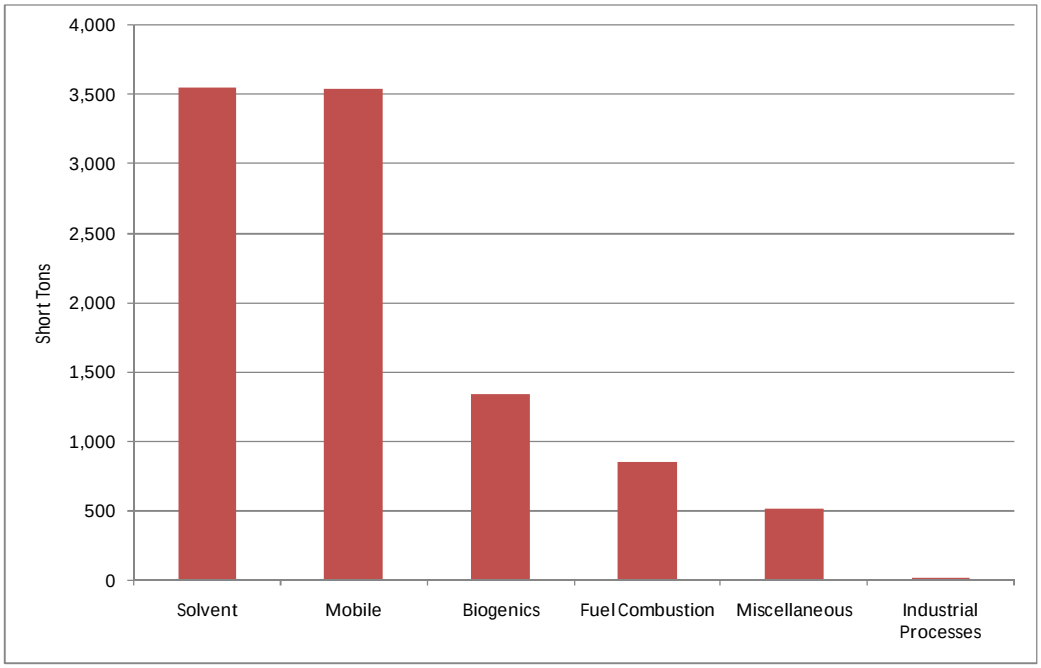


Figure 4: Sources of VOCs – District of Columbia (2011)

Source: http://www.epa.gov/air/emissions/index.htm

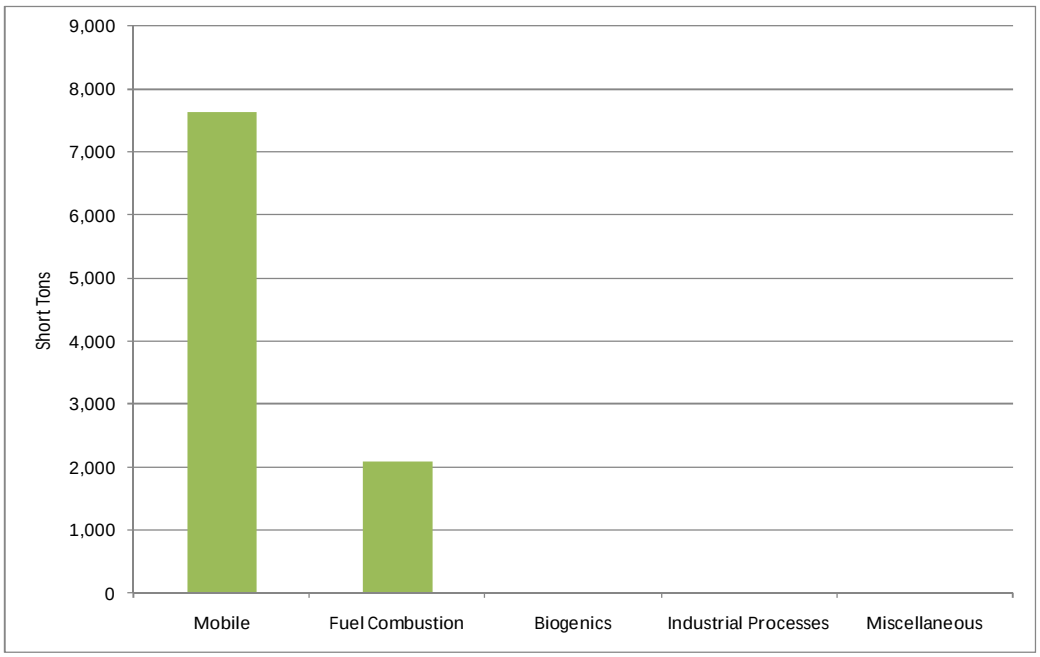


Figure 5: Sources of NOx – District of Columbia (2011)

Source: *http://www.epa.gov/air/emissions/index.htm*

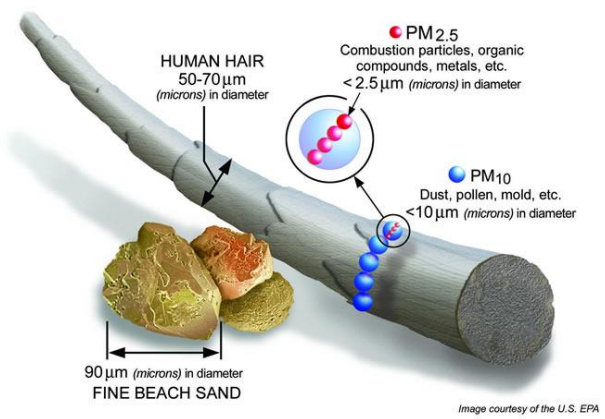
2.3.2 Particulate Matter

Particulate pollution is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. In general, particulate pollution can include dust, soot, and smoke; these can be irritating but usually are not poisonous.

Particulate pollution also can include bits of solid or liquid substances that can be highly toxic. Of particular concern are those particles that are smaller than, or equal to, 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) in size.

PM_{10} refers to particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair (Figure 6). Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gases emitted from motor vehicles undergo chemical reactions in the atmosphere. Major sources of PM_{10} include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Suspended particulates produce haze and reduce visibility.

Data collected through numerous nationwide studies indicate most PM_{10} comes from fugitive dust, wind erosion, and/or agricultural and forestry sources. A small portion of particulate matter is the product of fuel combustion processes. In the case of $PM_{2.5}$, the combustion of fossil fuels accounts for a significant portion of this pollutant. The main health effect of airborne particulate matter is on the respiratory system. $PM_{2.5}$ refers to particulates that are 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. Like PM_{10}, $PM_{2.5}$ can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Whereas, particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are small enough that they can penetrate deeper into the lungs and damage lung tissues. Figure 7 and Figure 8 show the sources of particulate matter in the Washington D.C area.



Source: EPA Office of Research and Development

Figure 6: Relative Particulate Matter Size

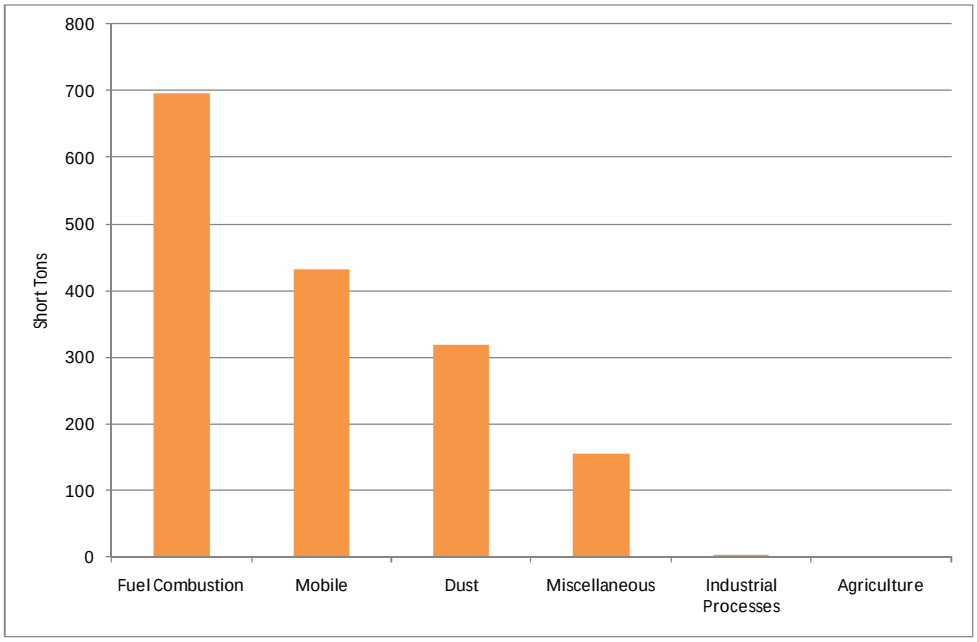


Figure 7: Sources of $PM_{2.5}$ – District of Columbia (2011)

Source: http://www.epa.gov/air/emissions/index.htm

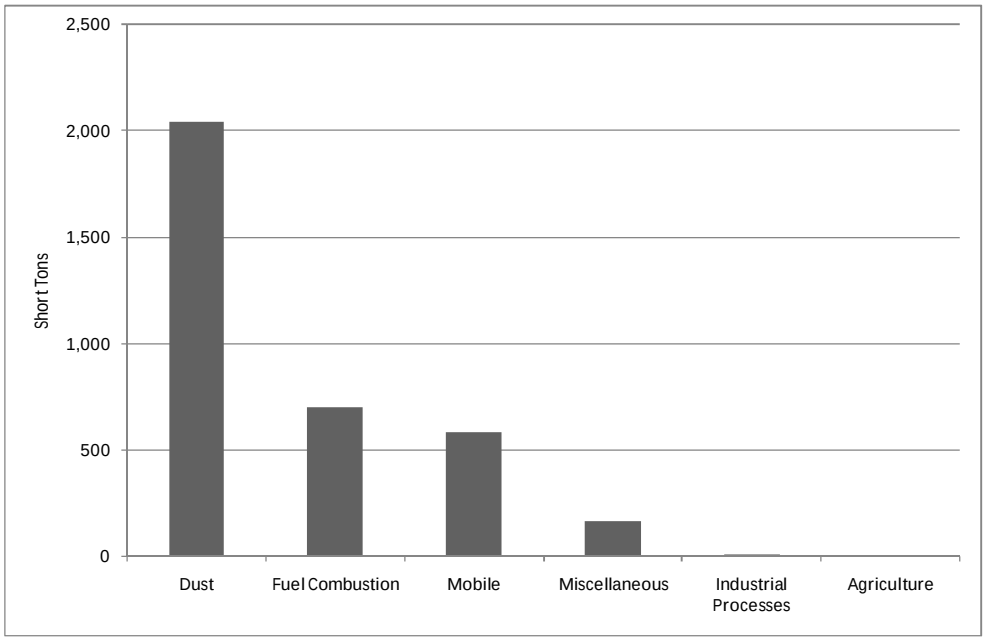


Figure 8: Sources of PM_{10} – District of Columbia (2011)

Source: *http://www.epa.gov/air/emissions/index.htm*

2.3.3 Carbon Monoxide

Carbon monoxide (CO), a colorless gas, interferes with the transfer of oxygen to the brain. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. As shown in Figure 9, on-road motor vehicle exhaust is the primary source of CO in the Washington D.C. area. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, or heart disease. CO levels are generally highest in the colder months of the year when inversion conditions (warmer air traps colder air near the ground) are more frequent. CO concentrations can vary greatly over relatively short distances. Relatively high concentrations of CO are typically found near congested intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban "street canyon" conditions. Consequently, CO concentrations must be predicted on a localized, or microscale, basis.

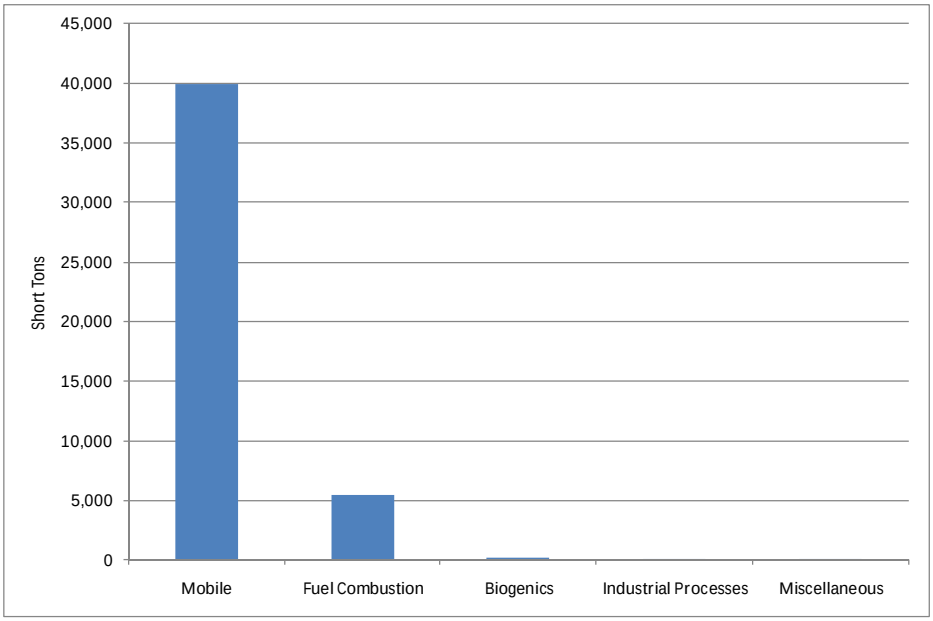


Figure 9: Sources of CO – District of Columbia (2011)

Source: http://www.epa.gov/air/emissions/index.htm

2.3.4 Nitrogen Dioxide

Nitrogen dioxide (NO_2), a brownish gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as nitrogen oxides (NOx) and are major contributors to ozone formation. NO_2 also contributes to the formation of PM_{10}, small liquid and solid particles that are less than 10 microns in diameter (see discussion of PM_{10} below). At atmospheric concentration, NO_2 is only potentially irritating. In high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in

children (two and three years old) has also been observed at concentrations below 0.3 parts per million (ppm).

2.3.5 Lead

Lead (Pb) is a stable element that persists and accumulates both in the environment and in animals. Its principal effects in humans are on the blood-forming, nervous, and renal systems. Lead levels in the urban environment from mobile sources have significantly decreased due to the federally mandated switch to lead-free gasoline.

2.3.6 Sulfur Dioxide

Sulfur dioxide (SO_2) is a product of high-sulfur fuel combustion. The main sources of SO_2 are coal and oil used in power stations, industry and for domestic heating. Industrial chemical manufacturing is another source of SO_2. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel.

2.4 Mobile Source Air Toxics

In addition to the criteria pollutants, USEPA also regulates air toxics. Most air toxics originate from human made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road mobile equipment. Some toxic compounds are present in fuel and are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The USEPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/ncea/iris/index.html). In addition, USEPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are:

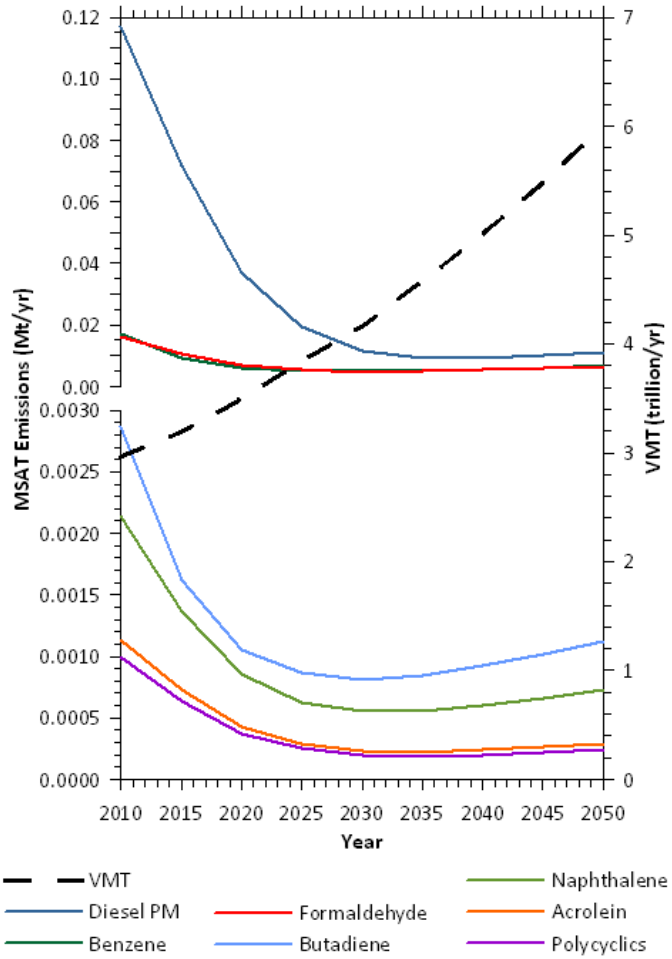
- **Benzene –** characterized as a known human carcinogen.
- **Acrolein –** the potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde –** a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- **1,3-butadiene –** characterized as carcinogenic to humans by inhalation.
- **Diesel Exhaust** (DE) **–** likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis.
- **Naphthalene –** the USEPA has classified naphthalene as a possible human carcinogen. Acute exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion.
- **Polycyclic Organic Matter (POM) –** defines a broad class of compounds that includes the polycyclic aromatic hydrocarbon compounds (PAHs), of which benzo[a]pyrene is a member. Cancer is the major concern from exposure to POM. The USEPA has classified seven PAHs (benzo[a]pyrene, benz[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) as probable human carcinogens.

While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future USEPA rules.

The USEPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (66 Federal Register 17229, March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel requirements. According to an FHWA analysis, future emissions likely would be lower than present levels as result of the USEPA's national control programs that are projected to reduce MSAT emission by 83 percent from 2010 to 2050, even if VMT increases by 102 percent, as shown in Figure 10.

On February 9, 2007 and under authority of CAA Section 202(l), USEPA signed a Final Rule, Control of Hazardous Air Pollutants from Mobile Sources, which sets standards to control MSATs from motor vehicles. Under this rule, USEPA is setting standards on fuel composition, vehicle exhaust emissions, and evaporative losses from portable containers. The new standards are estimated to reduce total emissions of MSATs by 330,000 tons in 2030, including 61,000 tons of benzene. Concurrently, total emissions of volatile organic compounds (VOCs) will be reduced by over 1.1 million tons in 2030 as a result of adopting these standards.



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents* (FHWA, 2012) - EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

Figure 10: National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using USEPA's MOVES2010b Model

2.5 Greenhouse Gases

In 2007, the Supreme Court decided in *Commonwealth of Massachusetts v. Environmental Protection Agency* that carbon dioxide is a pollutant, subject to regulation under the Clean Air Act. Since then, the federal government has taken a number of steps to regulate carbon dioxide emissions as part of an overall program addressing greenhouse gases (GHG). Thus, for example, EPA has adopted a Greenhouse Gas Monitoring, Recordkeeping and Reporting Rule requiring certain suppliers of fossil fuels or

industrial greenhouse gases to report to EPA on emissions from particular facilities. That rule does not apply to the activities contemplated by this Project.

Also, a number of federal agencies have concluded that it is not possible to link a project's emissions to particular climatic effects in a NEPA review. In particular, the 2010 Draft Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, authored by the Council on Environmental Quality, states that "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linage is difficult to isolate and to understand."

Some greenhouse gases, such as carbon dioxide, occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities include:

- Carbon Dioxide (CO_2);
- Methane (CH_4);
- Nitrous Oxide (N_2O); and
- Fluorinated Gases**.**

For transportation projects involving fossil fuel consumption, CO_2 is the predominant GHG emitted.

2.6 Attainment Status and Conformity with Regional Air Quality Planning

Section 107 of the 1977 CAAA requires that the USEPA publish a list of all geographic areas in compliance with the NAAQS, as well as those that are not in attainment of the NAAQS. The designation of an area is made on a pollutant-by-pollutant basis. The USEPA's area designations are shown in Table 2.

Table 2: Attainment Classifications and Definitions

Classification	Definition
Attainment	Area is in compliance with the NAAQS.
Unclassified	Area has insufficient data to make determination and is treated as being in attainment.
Maintenance	Area once classified as nonattainment but has since demonstrated attainment of the NAAQS.
Nonattainment	Area is not in compliance with the NAAQS.

The South Capitol Street project area is classified as a maintenance area for CO, a nonattainment area for $PM_{2.5}$ (for the 1997 standard), a marginal nonattainment area for O_3, and an attainment area for all other criteria pollutants.

The CAA requires that a State Implementation Plan (SIP) be prepared for each nonattainment area and a maintenance plan be prepared for each former nonattainment area that subsequently demonstrated compliance with the standards. A SIP is a compilation of a state's air quality control plans and rules that are approved by USEPA. Section 176(c) of the CAA provides that federal agencies cannot engage, support, or provide financial assistance for licensing, permitting, or approving any project unless the project conforms to the applicable SIP. The state and USEPAs' goals are to eliminate or reduce the severity and number of violations of the NAAQS and to achieve expeditious attainment of these standards.

The District of Columbia is part of the Metropolitan Washington Council of Governments (MWCOG), a regional organization of Washington area local governments. MWCOG is composed of 20 local governments surrounding the nation's capital, plus area members of the Maryland and Virginia legislatures, the US Senate and the US House of Representatives. Among other responsibilities, the MWCOG provides daily reports and forecasts of regional air quality. Through the MWCOG, the Metropolitan Washington Air Quality Committee (MWAQC) prepares the air quality plan for the District of Columbia, Maryland and Virginia metropolitan area as regulated under Section 174 of the CAA. The Transportation Planning Board (TPB), housed within the MWCOG, is the organization that brings together key decision makers to coordinate planning and funding for the region's transportation system. TPB members include local officials, representatives of state transportation agencies, the Washington Metropolitan Area Transit Authority (WMATA), state legislators, and others. The TPB is designated as a Metropolitan Planning Organization (MPO) and is therefore responsible for meeting federal metropolitan planning requirements for transportation. The TPB is staffed by the MWCOG.

The TPB produces two basic documents. The first is the *Financially Constrained Long-Range Transportation Plan* (CLRP) which includes all major transportation projects and programs that are planned in the Washington region over the next 25 years. The second document, the *Transportation Improvement Plan* (TIP), lists projects and programs that will be funded in the next six years. The CLRP and the TIP serve as the basis for the regional mobile source air quality analysis, which utilizes vehicle miles traveled (VMT) and emissions factors to determine emissions estimates for the entire transportation system. The analysis results, presented under the Transportation Conformity Rule, demonstrate that the plan and the TIP are consistent with the goals of the *State Implementation Plan* (SIP). The SIP includes a list of measures to reduce pollution in order for the area to become attainment by a designated date.

The South Capitol Street Project is listed in the 2010 CLRP (Project ID 1143), which was approved by TPB on November 17, 2010 and by the USDOT on February 9, 2011; the 2012 CLRP which was approved by TPB on July 18, 2012 and by the USDOT on May 30, 2013; and the 2013 CLRP, which was approved by TPB on July 17, 2013 and by the USDOT on January 22, 2014. The South Capitol Street Project is listed in the Washington Metropolitan Region's Fiscal Year 2005-2010 TIP (approved by TPB on November 17, 2004, USDOT on June 14, 2005), the FY 2006-2011 TIP (approved by TPB on October 19, 2005, USDOT on February 21, 2006), the FY 2007-2012 TIP (approved by TPB on October 18, 2006, USDOT on April 6, 2007), the FY 2008-2013 TIP (approved by TPB January 16, 2008, USDOT on June 11, 2008), and the FY 2009-2014 TIP (approved by TPB November 19, 2008, USDOT on February 17, 2009), the FY2010-2015 TIP

(approved by TPB on July 15, 2009, USDOT on January 28, 2010) and the FY 2011-2016 TIP (approved by TPB on November 17, 2010, USDOT on February 9, 2011) and the FY 2013-2018 TIP (approved by TPB on July 18, 2012, USDOT on May 30, 2013), where it is identified as TIP ID # 3423.

The Project comes from a conforming transportation plan and TIP that conforms with the SIP's purpose. MWAQC and TPB develop an Air Quality Conformity Report, which contains emissions ceilings (called "mobile emissions budgets") to which the TIP must conform. The analysis of the FY 2013-2018 TIP and the 2013 CLRP, which both include the South Capitol Street project. . The analysis in the Air Quality Conformity Report demonstrates that mobile source emissions, estimated for the TIP and for each analysis year of the long range plan, adhere to all carbon monoxide, ozone season volatile organic compound and nitrogen oxide, and fine particle (PM 2.5) pollutants (direct 2.5 and precursor nitrogen oxide) emissions budgets established by the Metropolitan Washington Air Quality Committee (MWAQC), which are either approved or under review by the USEPA. Additionally, the "action scenario" (forecast year) emissions for fine particles are not greater than the base year 2002 emissions, thus satisfying the requirement for pollutants without an established budget. These results provide a basis for a determination of conformity of the 2013 CLRP and the FY2013-2018 TIP.

2.7 Ambient Air Quality in the Project Area

2.7.1 Local Meteorology

The nature of the surrounding atmosphere is an important element in assessing the ambient air quality of an area. Summers in the District of Columbia area are warm and humid and winters are cold, but generally not severe. The summertime temperature is in the upper 80s and the winter is in the upper 20s. Thunderstorms can occur at any time but are most frequent during the late spring and summer. Annual precipitation has ranged from about 25 inches to more than 55 inches. Rainfalls of over 10 inches in a 24-hour period have been recorded during the passage of tropical storms. The seasonal snowfall is nearly 24 inches, but varies greatly from season to season. Snowfalls of 4 inches or more occur only twice each winter on average. Accumulations of over 20 inches from a single storm are extremely rare. Storm damage results mainly from heavy snows and freezing rains in winter and from hurricanes and severe thunderstorms during the other seasons.

Precipitation helps cleanse the atmosphere of pollutants. Very small particles in the atmosphere act as condensation nuclei, triggering the formation of raindrops, while larger particles are literally washed from the air during precipitation events. Precipitation also prevents the drying of the ground, alleviating the formation of fugitive dust; however, precipitation can combine with the oxides of sulfur and nitrogen to produce another form of pollution, namely acid rain.

Prevailing winds are from the south except during the winter months when they are from the northwest. The windiest periods are late winter and early spring. Winds are generally less during the night and early morning hours and increase to a high in the afternoon. Winds may reach 50 to 60 miles per hour or even higher during severe summer

thunderstorms, hurricanes, and winter storms. Wind speed direction and variability greatly influence on the dispersion of atmospheric pollutants.

2.7.2 Monitored Air Quality

MWCOG collects and distributes air quality data from monitors located throughout the District of Columbia. Five air quality monitors are located within the District of Columbia. The monitored air quality data collected from these locations for the years 2010-2012 is summarized and presented in Table 3.

Table 3: Ambient Air Quality Monitor Data 2010-2012

Pollutant		Verizon Phone Co. 2055 L St., NW			Riverside 420 34th St. NE			Takoma School, Piney Branch Road & Dahlia Street			2500 1st Street, N.W.			Park Services Office, 1100 Ohio Drive		
Carbon Monoxide (CO) [ppm]		**2010**	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
1-Hour	Maximum	2.8	5.0	2.5	3.7	2.7	2.9					3.1	2.5			
	2nd Maximum	2.7	4.2	2.2	3.7	2.7	2.9					3.0	2.4			
	# of Exceedences	0	0	0	0	0	0					0	0			
8-Hour	Maximum	2.4	2.2	2.0	3.5	2.5	2.8					2.5	1.9			
	2nd Maximum	2.0	1.9	1.9	3.1	2.3	2.5					2.4	1.8			
	# of Exceedences	0	0	0	0	0	0					0	0			
Particulate Matter [ug/m^3]																
PM_{10}	Maximum 24-Hour				91	52					99	45	42			
	# of Exceedences				0	0					0	0	0			
$PM_{2.5}$	98th Percentile				28	25	28				26	25	24	23	26	24
	Mean Annual				11.4	10.4	9.8				10.5	10.3	9.6	11.0	10.2	9.8
	# of Exceedences				0	0	0				0	0	0	0	0	0
Ozone (O_3) [ppm]																
8-Hour	Fourth Highest				0.086	0.080	0.076	0.079			0.082	0.085	0.087			
	# of Exceedences				15	6	4	6			16	11	11			
Nitrogen Dioxide (NO_2) [ppb]																
1-Hour	98th Percentile				59	55	51	55			57	52	50			
	# of Exceedences				0	0	0	0			0	0	0			
Sulfur Dioxide (SO_2) [ppb]																
1-Hour	99th Percentile				21	20						5				
	# of Exceedences				0	0						0				

Source: USEPA Office of Air Quality Planning and Standards (AIRSData); http://www.epa.gov/airquality/airdata/ad_reports.html
Note: Grey shaded blocks represent areas of no measurement.

3.0 Environmental Consequences

3.1 Sources of Emissions

Pollutants that can be traced principally to motor vehicles are relevant to the evaluation of the project impacts; these pollutants include carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), ozone (O_3), particulate matter of 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) and MSATs. Transportation sources account for a small percentage of regional emissions of sulfur oxides (SOx) and lead (Pb); thus, a detailed analysis is not required.

HCs (also known as volatile organic compounds [VOCs]) and NO_x emissions from automotive sources are a concern primarily because they are precursors to the formation of ozone (O_3) and particulate matter (PM). Ozone is formed through a series of reactions that occur in the atmosphere in the presence of sunlight. Since the reactions are slow and occur as the pollutants diffuse downwind, elevated ozone levels often are found many miles from sources of the precursor pollutants. Therefore, the effects of HC and NO_x emissions generally are examined on a regional or "mesoscale" basis.

PM_{10} and $PM_{2.5}$ impacts are both regional and local. A substantial portion of particulate matter, especially PM_{10}, comes from disturbed vacant land, construction activity and paved road dust. $PM_{2.5}$ also comes from these sources. Motor vehicle exhaust, particularly from diesel vehicles, is also a source of PM_{10} and $PM_{2.5}$. PM_{10}, and especially $PM_{2.5,}$ can also be created by secondary formation from precursor elements such as SO_2, NO_X, VOCs, and ammonia (NH_3). Secondary formation occurs due to chemical reactions in the atmosphere, which are generally downwind some distance from the original emission source. Thus, it is appropriate to predict concentrations of PM_{10} and $PM_{2.5}$ on both a regional and a localized basis.

CO impacts are generally localized. Even under the worst meteorological conditions and most congested traffic conditions, high concentrations are limited within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle emissions are the major sources of CO. The South Capitol Street Project could change traffic patterns within the project area. Consequently, it is appropriate to predict concentrations of CO on both a regional and a localized or "microscale" basis.

The MSAT impacts are both regional and local. Through the issuance of USEPA's Final Rule regarding emission control of Hazardous Air Pollutants from Mobile Sources [66 FR 17229], it was determined that many existing and newly promulgated mobile source emission control programs would result in a reduction of MSATs. The USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel requirements. Future emissions likely would be lower than present levels as result of the USEPA's national control programs that are projected to reduce MSAT emission by 83 percent from 2010 to 2050 even if VMT increases by 102 percent.

3.2 Analysis Methodology

3.2.1 Regional Analysis

The regional or mesoscale analysis of a project determines a project's overall impact on air quality levels beyond the immediate project area. A transportation project is analyzed as part of a regional transportation network developed by the County or State. Projects included in this network are found in the *Financially Constrained Long-Range Transportation Plan* (CLRP) and the *Transportation Improvement Plan* (TIP). The CLRP and the TIP are the basis for the regional analysis which utilizes VMT and vehicle hours traveled (VHT) within the region to determine daily "pollutant burden" levels. The results of this analysis determine if an area is in conformity with regulations set forth in the USEPA's Final Conformity Rule.

This project comes from a conforming transportation plan and TIP that conforms with the SIP's purpose. MWAQC and TPB develop an Air Quality Conformity Report, which contains emissions ceilings (called "mobile emissions budgets") to which the TIP must conform. The analysis of the FY 2013-2018 TIP and the 2013 CLRP, which both include the South Capitol Street project, was approved by the TPB on July 18, 2012 and July 17, 2013, respectively; and by the USDOT on May 30, 2013 and January 22, 2014, respectively. The analysis in the Air Quality Conformity Report demonstrates that mobile source emissions, estimated for the TIP and for each analysis year of the long range plan, adhere to all carbon monoxide, ozone season, volatile organic compound, and nitrogen oxide, and fine particle (PM 2.5) pollutants (direct 2.5 and precursor nitrogen oxide) emissions budgets established by the MWAQC, which are either approved or under review by the USEPA. As such, the Project's regional air quality has been found to conform with the goals of the SIP. To demonstrate the Project's regional impact, a regional analysis based on overall regional VMT and VHT has been conducted.

3.2.2 Particulate Matter (PM_{10} & $PM_{2.5}$) Analysis

In March 10, 2006, the USEPA issued a Final Rule regarding the localized or "hot-spot" analysis of $PM_{2.5}$ and PM_{10} (40 CFR Part 93). This rule requires that a $PM_{2.5}$ and/or PM_{10} hotspot analysis be performed only for transportation projects with substantial diesel traffic in areas not meeting $PM_{2.5}$ and/or PM_{10} air quality standards. The project area is classified as an attainment area for $PM_{10.}$ As such, a hotspot analysis is not required. The project area is classified as a nonattainment area for $PM_{2.5}$. As such, it must be determined if the project is classified as one of air quality concern, thus requiring a quantitative analysis. This evaluation will be determined following the USEPA's November 2013 guidance "*Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA420-B-13-053).

3.2.3 MSAT Analysis

On February 3, 2006, the FHWA released *Interim Guidance on Air Toxic Analysis in NEPA Documents.* This guidance was superseded on December 6, 2012 by FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents.* The purpose of FHWA's guidance is to advise on when and how to analyze Mobile Source Air Toxics

(MSATs) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As the science progresses, FHWA will update the guidance.

A quantitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The quantitative assessment presented is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* (FHWA, 2006b). The FHWA's Interim Guidance groups projects into the following tier categories:

1. No analysis for projects without potential for meaningful MSAT effects.
2. Qualitative analysis for projects with low potential MSAT effects.
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

3.2.4 Microscale CO Air Quality Analysis

Microscale air quality modeling was performed using the most recent version of the USEPA mobile source emission factor model (MOVES2010b) and the CAL3QHC (Version 2.0) air quality dispersion model to estimate future No Build Alternative and future Build Alternative CO levels at selected locations in the project area.

3.2.4.1. Dispersion Model

Mobile source models are the basic analytical tools used to estimate CO concentrations expected under given traffic, roadway geometry, and meteorological conditions. The mathematical expressions and formulations that comprise the various models attempt to describe an extremely complex physical phenomenon as closely as possible. The dispersion modeling program used in this project for estimating pollutant concentrations near roadway intersections is the CAL3QHC (Version 2.0) dispersion model developed by the USEPA and released in 1992.

CAL3QHC is a Gaussian model recommended in the *USEPA Guidelines for Modeling Carbon Monoxide from Roadway Intersections* (EPA-454/R-92-005). Gaussian models assume that the dispersion of pollutants downwind of a pollution source follow a normal distribution from the center of the pollution source.

Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating, and moving at different average speeds. CAL3QHC simplifies these different emission rates into two components:

- Emissions when vehicles are stopped (idling) during the red phase of a signalized intersection.
- Emissions when vehicles are in motion during the green phase of a signalized intersection.

The CAL3QHC (Version 2.0) air quality dispersion model has undergone extensive testing by the USEPA and has been found to provide reliable estimates of inert (nonreactive) pollutant concentrations resulting from motor vehicle emissions. A complete description of the model is in the *User's Guide to CAL3QHC (Version 2.0): A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections* (EPA-454/R-92-006).

3.2.4.2. Vehicular Emissions

Emission factors were developed using the latest version of USEPA's Motor Vehicle Emission Simulator (MOVES), MOVES2010b. MOVES2010b is the USEPA's state-of-the-art tool for estimating emissions from highway vehicles. The model is based on analyses of millions of emission test results and considerable advances in the agency's understanding of vehicle emissions. Compared to previous tools, MOVES2010b incorporates the latest emissions data, more sophisticated calculation algorithms, increased user flexibility, new software design, and significant new capabilities. Input parameters for MOVES2010b were obtained from MWCOG.

3.2.4.3. Site Selection and Receptor Locations

A screening evaluation was performed to identify which intersections in the project area are most congested and would be most affected by the SEIS Preferred Alternative. Eighty-four locations, listed in Table 4, were screened based on changes in intersection volumes, delay, and Levels of Service (LOS) from No Build to the SEIS Preferred Alternative. Sites fail the screening evaluation if the Level of Service decreases below D in one of the Build Alternatives as compared to the No Build Alternative, or if the delay and/or volume increase from the No Build Alternative to Build Alternative along with a LOS below D.

Sixteen of the 84 locations failed the screening analysis, including:

1. West Oval and Southbound (SB) South Capitol St Entrance
2. West Oval and R St Entrance
3. West Oval and SB South Capitol St Exit
4. West Oval and Northbound (NB) South Capitol St Entrance
5. South Capitol St and N St SW
6. South Capitol St and M St
7. South Capitol St and Firth Sterling Ave
8. Suitland Pkwy and Firth Sterling Ave
9. Suitland Pkwy and Stanton Rd
10. 11th St and O St
11. 11th St and Southeast-Southwest (SE-SW) Freeway Blvd
12. Suitland Pkwy and I-295 SB Ramps

13. East Oval and NB South Capitol St
14. East Oval and SB South Capitol St Entrance
15. East Oval and NB Suitland Pkwy
16. East Oval and Poplar Point Access Rd

Based on the screening analysis, geographical representation and community concerns, 10 analysis locations were chosen for detailed analysis. Due to the proximity of locations that failed the screening analysis to each other, some of the 10 analysis locations include more than one intersection. The sites chosen for detailed analysis, as shown in Figure 11, are:

1. Southbound I-395 and Ramp to SE-SW Freeway
2. North Carolina Avenue SE and 1st Street SE
3. M Street and South Capitol Street
4. N Street and South Capitol Street
5. South Capitol Street West Oval at Potomac Avenue
6. South Capitol Street West Oval at bridge leg, including Q street Potomac Avenue, west leg and South Capitol Street
7. South Capitol Street at East Oval including Howard Road and Suitland Parkway
8. Defense Road, Firth Sterling Avenue, South Capitol Street (including Stevens Road in the Build scenario)
9. SB I-295 Off Ramp and Suitland Parkway
10. NB I-295 off ramp to Suitland Parkway, and Firth Sterling Avenue

Table 4: Air Quality Microscale Screening Analysis

#	Intersection	2040 SDEIS No Build						2040 SDEIS Build					
		AM			PM			AM			PM		
		Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume
1	7th St and Capitol Square Pl/ I-395 Ramp	7.6	A	1505	2.5	A	1300	7.6	A	1505	2.5	A	1300
2	7th St and Frontage Rd	20.0	B	1835	16.9	B	1355	20.0	B	1835	16.7	B	1355
3	7th St and E St	2.8	A	1785	2.9	A	980	2.8	A	1785	2.9	A	980
4	South Capitol St and Potomac Ave	64.2	E	6705	218.4	F	6390	N/A	N/A	N/A	N/A	N/A	N/A
5	West Oval and NB South Capitol St Exit	N/A	N/A	N/A	N/A	N/A	N/A	23.8	C	5245	3.2	A	4865
6	West Oval and SB South Capitol St Entrance	N/A	N/A	N/A	N/A	N/A	N/A	120.4	F	3145	206.4	F	4010
7	West Oval and WB Potomac Ave Exit	N/A	N/A	N/A	N/A	N/A	N/A	3.7	A	885	3.1	A	560
8	West Oval and R St Entrance	N/A	N/A	N/A	N/A	N/A	N/A	5.1	A	2460	92.8	F	4545
9	West Oval and SB South Capitol St Exit	N/A	N/A	N/A	N/A	N/A	N/A	114.0	F	6520	23.5	C	6725
10	West Oval and NB South Capitol St Entrance	N/A	N/A	N/A	N/A	N/A	N/A	234.2	F	4340	29.7	C	2670
11	West Oval and Potomac Ave	N/A	N/A	N/A	N/A	N/A	N/A	47.1	D	4700	14.1	B	3195
12	South Capitol St and P St SW	3.4	A	5715	12.6	B	5190	5.3	A	5320	9.0	A	5020
13	South Capitol St and O St SW	0.4	A	5650	0.2	A	4985	6.1	A	5355	6.8	A	4845
14	South Capitol St and N St SW	24.0	C	5745	29.6	C	5055	60.6	E	5590	16.8	B	4950
15	South Capitol St SB and M St	33.6	C	3240	25.7	C	3870	N/A	N/A	N/A	N/A	N/A	N/A
16	South Capitol St NB and M St	55.3	E	3500	46.0	D	3885	N/A	N/A	N/A	N/A	N/A	N/A
17	South Capitol St and M St	N/A	N/A	N/A	N/A	N/A	N/A	104.7	F	7590	117.2	F	7490

#	Intersection	2040 SDEIS No Build						2040 SDEIS Build					
		AM			PM			AM			PM		
		Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume
18	South Capitol St SB and L St SW	10.6	B	655	10.9	B	540	N/A	N/A	N/A	N/A	N/A	N/A
19	South Capitol St NB and L St SW	18.0	C	920	12.9	B	660	N/A	N/A	N/A	N/A	N/A	N/A
20	South Capitol St and L St SW	N/A	N/A	N/A	N/A	N/A	N/A	6.0	A	5130	7.5	A	4485
21	South Capitol St SB and K St SW	N/A	N/A	5330	N/A	N/A	4710	5.4	A	5105	9.0	A	4580
22	South Capitol St and I St SW	85.7	F	5945	20.0	C	5120	10.6	B	5415	14.3	B	4785
23	South Capitol St SB and I-395 Ramp	30.0	C	1995	26.9	C	2245	15.4	B	4845	10.5	B	3910
24	South Capitol St and Virginia Ave	8.0	A	1290	4.9	A	1885	7.1	A	1220	5.0	A	1795
25	South Capitol St and Washington Ave	13.0	B	1355	27.6	C	2040	25.0	C	1285	24.4	C	1950
26	South Capitol St and Canal St/Washington Ave	27.1	C	1185	25.1	C	855	31.7	C	1015	31.8	C	665
27	3rd St and I St/ I-695 Ramp	6.7	A	545	24.7	C	1050	12.3	B	545	24.7	C	1050
28	5th St and Virginia Ave/ I-695 Ramp	11.9	B	476	17.9	B	600	11.8	B	476	17.7	B	600
29	8th St and I-695 Ramp	17.7	B	550	14.8	B	935	15.9	B	550	15.2	B	935
30	8th St and Virginia Ave	12.8	B	725	12.5	B	880	12.8	B	725	12.5	B	880
31	8th St and I St	19.3	B	1155	8.2	A	1055	19.2	B	1155	7.1	A	1055
32	11th St and N St	22.3	C	2175	11.2	B	2810	22.4	C	2175	10.4	B	2830
33	11th St and M St	62.3	E	3745	92.2	F	4920	62.3	E	3745	79.7	E	4840
34	11th St and I St	17.6	B	1685	22.1	C	1820	18.4	B	1685	22.5	C	1800
35	12th St and M St	39.5	D	1885	27.5	C	1620	39.5	D	1885	28.8	C	1610
36	MLK Jr. Ave and South Capitol St	41.2	D	2995	17.4	B	3135	46.9	D	3090	19.6	B	3310

#	Intersection	2040 SDEIS No Build						2040 SDEIS Build					
		AM			PM			AM			PM		
		Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume
37	Malcolm X Ave and West Access Rd	31.8	C	1970	18.3	B	1740	31.8	C	1970	17.9	B	1740
38	Malcolm X Ave and 2nd St	44.7	E	1610	50.4	F	1520	44.7	E	1610	50.3	F	1520
39	MLK Jr. Ave and Gate 1 West Campus/ UCC Visitor East	N/A	N/A	N/A	18.5	B	2725	4.1	A	2465	18.5	B	2725
40	MLK Jr. Ave and Sumner Rd/ Stanton Rd	20.3	C	2190	18.9	B	2535	6.1	A	2380	8.9	A	2615
43	South Capitol St and Firth Sterling Ave	88.4	F	2982	77.8	E	2982	99.5	F	3077	61.7	E	3207
44	Firth Sterling Ave and West Access Rd	31.2	C	1450	43.0	D	2230	31.9	C	1350	39.2	D	2105
45	Firth Sterling Ave and Barry Rd	13.7	B	1300	18.1	B	2030	4.3	A	950	7.7	A	1615
46	Suitland Pkwy and Firth Sterling Ave	53.8	D	4785	262.0	F	5510	68.2	E	6530	91.0	F	6740
47	Howard Rd and Anacostia Metro Parking Garage	12.6	B	1070	28.5	C	1435	N/A	N/A	N/A	N/A	N/A	N/A
48	Howard Rd and Anacostia Metro Parking Garage	N/A	N/A	N/A	N/A	N/A	N/A	3.4	A	765	11.1	B	790
49	Howard Rd and Firth Sterling Ave	68.0	E	3115	62.6	E	3335	22.7	C	1120	15.5	B	1355
50	Howard Rd and Anacostia Metro Station	1.9	A	1465	1.7	A	1385	4.1	A	670	3.3	A	830
51	Howard Rd Street Car Crossing	5.1	A	1447	6.5	A	1367	6.6	A	652	8.3	A	812
52	MLK Jr. Ave and Howard Rd	101.0	F	2370	103.9	F	2905	32.3	C	1395	37.7	D	2050
53	MLK Jr. Ave and Talbert St	9.7	A	1335	14.4	B	2115	10.3	B	1285	6.4	A	1885
54	MLK Jr. Ave and Morris Rd	8.8	A	1065	9.3	A	1745	9.7	A	1015	8.5	A	1595
55	MLK Jr. Ave and Chicago St	15.7	B	1250	10.5	B	2000	16.5	B	1200	7.7	A	1850
56	MLK Jr. Ave and W St	8.9	A	1155	33.4	C	2080	8.6	A	1105	36.9	D	2020

#	Intersection	2040 SDEIS No Build						2040 SDEIS Build					
		AM			PM			AM			PM		
		Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume
57	MLK Jr. Ave and U St	9.6	A	780	5.5	A	1685	9.7	A	730	6.1	A	1695
58	MLK Jr. Ave and Good Hope Rd	104.2	F	2525	160.7	F	3505	99.7	F	2475	160.4	F	3535
59	Good Hope Rd and 13th St	15.7	B	2045	8.6	A	1940	15.7	B	2045	8.8	A	1980
60	Suitland Pkwy and Stanton Rd	151.6	F	4215	129.1	F	4695	157.6	F	4290	127.3	F	4675
61	11th St and O St	112.7	F	2666	62.2	E	3816	112.9	F	2646	61.2	E	3826
62	11th St and SE Freeway Blvd	59.8	E	4715	35.2	D	5355	60.7	E	4715	34.7	C	5335
63	12th St and SE Freeway Blvd	17.4	B	3560	9.9	A	3045	15.8	B	3560	8.0	A	3045
64	Firth Sterling Ave and Eaton Rd	13.5	B	1160	16.8	B	1775	6.9	A	980	7.7	A	1600
65	MLK Jr. Ave and Suitland Pkwy EB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	26.8	C	2310	26.7	C	2500
66	MLK Jr. Ave and Suitland Pkwy WB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	14.0	B	1645	17.8	B	1740
67	Suitland Pkwy and I-295 NB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	38.5	D	6765	21.3	C	6725
68	Suitland Pkwy and I-295 SB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	13.6	B	5155	120.6	F	6050
69	South Capitol St and Howard Rd	13.3	B	685	24.5	C	1005	N/A	N/A	N/A	N/A	N/A	N/A
70	South Capitol St and Suitland Pkwy	31.7	C	3740	28.3	C	1565	N/A	N/A	N/A	N/A	N/A	N/A
71	East Oval and NB South Capitol St	N/A	N/A	N/A	N/A	N/A	N/A	113.2	F	6520	67.1	E	6725
72	East Oval and SB South Capitol St Entrance	N/A	N/A	N/A	N/A	N/A	N/A	9.0	A	2430	115.3	F	4430
73	East Oval and SB South Capitol St Exit	N/A	N/A	N/A	N/A	N/A	N/A	1.0	A	895	7.1	A	1595
74	East Oval and SB Suitland Pkwy	N/A	N/A	N/A	N/A	N/A	N/A	42.4	D	3035	13.0	B	3650

#	Intersection	2040 SDEIS No Build						2040 SDEIS Build					
		AM			PM			AM			PM		
		Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume
75	East Oval and NB Suitland Pkwy	N/A	N/A	N/A	N/A	N/A	N/A	174.3	F	4270	113.0	F	2565
76	East Oval and Poplar Point Access Rd	N/A	N/A	N/A	N/A	N/A	N/A	64.6	E	4735	26.4	C	2955
77	I-295 SB Ramps and West Access Rd	17.3	B	1590	11.8	B	850	17.3	B	1590	11.5	B	820
78	South Capitol St SB Ramps and Malcolm X Ave	37.2	D	1705	22.4	C	2015	37.2	D	1705	22.3	C	2015
79	South Capitol St NB Ramps and Malcolm X Ave	16.3	B	1345	10.5	B	1560	16.3	B	1345	9.9	A	1560
80	M St and Half St SW	9.3	A	2855	23.1	C	3615	8.2	A	2805	20.1	C	3495
81	M St and Half St SE	16.5	B	2364	10.6	B	3094	12.6	B	2370	9.6	A	2964
82	South Capitol St and G St	5.1	A	1250	10.2	B	1815	N/A	N/A	N/A	N/A	N/A	N/A
83	South Capitol St and I-695 WB Ramp	N/A	N/A	N/A	N/A	N/A	N/A	60.3	E	3360	59.6	E	2940
84	5th St and Virginia Ave	25.7	C	121	30.3	C	525	26.9	C	111	31.5	C	525

Note: Gray shaded areas highlight intersections projected to have unacceptable (E) or failing (F) levels of service due to the project.

Figure 11: Air Quality Analysis Sites

3.2.4.4. Meteorological Conditions

The transport and concentration of pollutants emitted from motor vehicles are influenced by three principal meteorological factors: wind direction, wind speed, and the atmosphere's profile. The values for these parameters were chosen to maximize pollutant concentrations at each prediction site (that is, to establish a conservative, worst-case situation).

3.2.4.5. Wind Direction

Maximum CO concentrations normally are found when the wind is assumed to blow parallel to a roadway adjacent to the receptor location. At complex intersections, it is difficult to predict which wind angle will result in maximum concentrations. Therefore, the approximate wind angle that would result in maximum pollutant concentrations at each receptor location was used in the analysis. All wind angles from 0° to 360° (in 5° increments) were considered.

3.2.4.6. Wind Speed

Concentrations of CO are greatest at low wind speeds. A conservative wind speed of one meter per second (2.2 miles per hour) was used to predict CO concentrations during peak traffic periods.

3.2.4.7. Temperature and Profile of the Atmosphere

A minimum temperature of 33°F, a maximum temperature of 53°F, a "mixing" height (the height in the atmosphere to which pollutants rise) of 1000 meters, and neutral atmospheric stability (stability class D) conditions were used in estimating microscale CO concentrations. The selection of these meteorological parameters was based on recommendations from the MWCOG.

The CO levels estimated by the model are the maximum concentrations which could be expected to occur at each air quality receptor site analyzed, given the assumed simultaneous occurrence of a number of worst-case conditions: peak-hour traffic conditions, conservative vehicular operating conditions, low wind speed, low atmospheric temperature, neutral atmospheric conditions, and maximizing wind direction.

3.2.4.8. Persistence Factor

Peak eight-hour concentrations of CO were obtained by multiplying the highest peak hour CO estimates by a persistence factor. The persistence factor accounts for the fact that:

- Over eight-hours (as distinct from a single hour) vehicle volumes will fluctuate downward from the peak hour.
- Vehicle speeds may vary.
- Meteorological conditions including wind speed and wind direction will vary compared to the conservative assumptions used for the single hour.

A persistence factor of 0.7 was used in this analysis. This factor is recommended by MWCOG, and approved by the USEPA.

3.2.4.9. Background Concentrations

Microscale modeling is used to predict CO concentrations resulting from emissions from motor vehicles using roadways immediately adjacent to the locations at which predictions are being made. A CO background level must be added to this value to account for CO entering the area from other sources upwind of the receptors. The CO background level should be located away from the influence of local traffic congestion. For the project area, the data collected at the Riverside Monitor Station, located at 420 34th Street, NW DC was used. In previous analyses, the monitor at Annandale, VA monitoring station, located southwest of Washington, DC at 6507 Columbia Pike, in the State of Virginia was used but this site has been discontinued. The second highest monitored one-hour CO concentration during the period of 2010 – 2012 was 3.7 ppm; the second highest eight-hour average was 3.1 ppm. These values were conservatively used as the background for all CO modeling analyses. Future CO background levels are anticipated to be lower than existing levels due to mandated emission source reductions.

3.2.4.10. Traffic Information

Traffic data for the air quality analysis were derived from traffic counts and other information developed as part of an overall traffic analysis for the Project using methodology accepted by DDOT. Output from the "Synchro 8" signal timing traffic model was used to obtain signal timing parameters. The microscale CO analysis was performed based on data from this analysis for the AM and PM peak traffic periods. These are the periods when maximum traffic volumes occur on local streets and when the greatest traffic and air quality effects of the proposed Project are expected.

The percentages of each type of vehicle, for the existing and future year conditions, were determined using data for the Metropolitan Washington Area provided by the MWCOG. Vehicle speeds used in the analysis were obtained from traffic information developed for the Project.

3.2.4.11. Analysis Years

CO concentrations were predicted for the existing (2013), opening (2020) and design (2040) years for the project.

3.3 Regional Emission Burden Assessment

The regional emission burden analysis of a project determines a project's overall impact on air quality levels beyond the immediate project area.

As shown in Table 5, an emission burden analysis based on the DC region's 2040 daily vehicle miles traveled (VMT) and daily vehicle hours traveled (VHT) was conducted for the Build Alternative and compared to the No Build Alternative. This is a refinement from previous analyses which analyzed the entire MWCOG region. Emission factors were calculated using USEPA's MOVES2010b mobile source emission factor program. The Build Alternative is expected to reduce regional emissions by approximately 0.3%. Based on these results, the Build Alternative is predicted to have no measurable impact on regional pollutant burdens.

Table 5: Regional Emission Burden Assessment

	Pollutant (Tons per day)					Percent change from No Build				
	CO	NO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	PM_{10}	$PM_{2.5}$	VOC
No Build	37.19	2.83	0.31	0.29	0.91	-	-	-	-	-
Build	37.08	2.83	0.31	0.29	0.90	-0.30%	-0.30%	-0.30%	-0.30%	-0.30%

Notes:

CO= Carbon Monoxide

NO_x= Nitrogen Oxides

PM_{10}= Particulate Matter

$PM_{2.5}$= Fine Particulate Matter

VOC= Volatile Organic Compounds

3.4 Greenhouse Gas Analysis

Based on the regional traffic data, the project is predicted to decrease VMT by approximately 0.3% as compared to the no build scenario and have no measurable effect on average network speed. Operational energy requirements for the vehicles using the facility are expected to demonstrate no measurable change. As such, the project is not predicted to measurably affect greenhouse gas levels.

3.5 $PM_{2.5}$ Assessment

Following the guidelines in the USEPA's *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*, a $PM_{2.5}$ hot-spot analysis should be conducted only if the project is a project of air quality concern, defined in 40 CFR 93.123(b)(1) as:

(i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

(ii) Projects affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E or F because of increased traffic volumes from a significant number of diesel vehicles;

(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

As shown in Table 6, the average annual daily traffic and truck percentage in the project area show minor changes between the SDEIS No Build Alternative and the SDEIS Revised Preferred Alternative.

In 2040, the overall truck percentage under the No Build Alternative is predicted to be 5.8 percent. The 2040 overall truck percentage under the SDEIS Revised Preferred Alternative is predicted to be 5.4 percent. This difference is considered beyond the accepted accuracy of the traffic model; therefore, both alternatives are considered to have a truck percentage of 6 percent. As such, the project is not projected to cause an increase in diesel vehicles. In 2020, similar truck percentages are expected between No Build and Build alternatives. In essence, the project is not expected to increase overall truck percentages within the study area.

The percentage of truck volumes under the No Build Alternative and the Build Alternative does not change; rather, there is an overall increase in volume at these sites, as shown in Table 6. As such, the changes do not indicate a significant increase in diesel vehicles due to the project.

The largest increase in truck percentages due to the project is estimated to occur at N and O Streets and at Firth Sterling, near Defense Road and Summer Road. The project is estimated to increase truck traffic by approximately 2 percent in 2040. The 2040 Build AADT at O and N streets are approximately 2,000 and at Firth Sterling Avenue it is approximately 5,500 to 6,500. Considering the relatively low AADT at this location, the predicted increase in truck traffic is not substantial.

Based on the results of the air quality analysis, the project is not considered to meet the criteria of a project of air quality concern as established in 40 CFR 93.123(b)(1). As such, the project is not considered a project of $PM_{2.5}$ concern, and the USEPA has determined that such projects do not require any further hot-spot analysis. Therefore, no $PM_{2.5}$ impacts are expected with the Build Alternative.

Table 6: Annual Average Daily Traffic (AADT) and Truck Percentage

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
I-295 Northbound							
between Malcolm X Avenue and Suitland Parkway	46,523	46,867	7.0%	7.0%	3,260	3,280	20
between Suitland Parkway and 11th Street Bridges	58,997	61,602	7.0%	7.0%	4,130	4,310	180
I-295 Southbound							
between Malcolm X Avenue and Suitland Parkway	47,368	48,253	7.0%	6.0%	3,320	2,900	-420
between Suitland Parkway and 11th Street Bridges	57,961	59,674	7.0%	6.0%	4,060	3,580	-480
Suitland Parkway Northbound							
between Stanton Road and Martin Luther King Jr. Avenue	24,613	24,671	1.0%	1.0%	250	250	0
between Martin Luther King Jr. Avenue and Firth Sterling Avenue	23,184	33,193	1.0%	1.0%	230	330	100
under I-295 Overpass	21,632	22,438	1.0%	1.0%	220	220	0
Suitland Parkway Southbound							
between Stanton Road and Martin Luther King Jr. Avenue	22,251	23,477	2.0%	1.0%	450	230	-220
between Martin Luther King Jr. Avenue and Firth Sterling Avenue	19,289	31,599	2.0%	1.0%	390	320	-70
under I-295 Overpass	20,897	33,643	2.0%	1.0%	420	340	-80
South Capitol Street Northbound							
between Malcolm X Avenue and Defense Boulevard	18,414	17,995	4.0%	4.0%	740	720	-20
between Defense Boulevard and Suitland Parkway	20,045	19,081	4.0%	4.0%	800	760	-40
on Frederick Douglass Bridge	40,298	42,121	6.0%	6.0%	2,420	2,530	110
between Potomac Avenue and N Street	31,599	31,625	6.0%	6.0%	1,900	1,900	0

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
at M Street Interchange (between N Street and I Street)	23,212	32,268	6.0%	6.0%	1,390	1,940	550
between I Street and I-395 Overpass	40,920	35,560	6.0%	6.0%	2,460	2,130	-330
between I-395 Overpass and E Street	17,273	15,032	14.0%	14.0%	2,420	2,100	-320
between E Street and D Street	1,993	1,587	14.0%	14.0%	280	220	-60
South Capitol Street Southbound							
between Malcolm X Avenue and Defense Boulevard	15,559	15,918	3.0%	3.0%	470	480	10
between Defense Boulevard and Suitland Parkway	17,031	17,157	3.0%	3.0%	510	510	0
on Frederick Douglass Bridge	32,339	40,198	5.0%	5.0%	1,620	2,010	390
between Potomac Avenue and N Street	25,648	30,643	6.0%	6.0%	1,540	1,840	300
at M Street Interchange (between N Street and I Street)	19,129	26,415	6.0%	6.0%	1,150	1,580	430
between I Street and I-395 Overpass	28,887	30,763	6.0%	6.0%	1,730	1,850	120
between I-395 Overpass and E Street	10,124	11,695	13.0%	13.0%	1,320	1,520	200
between E Street and D Street	2,947	3,108	13.0%	13.0%	380	400	20
I-395 Eastbound							
upstream of South Capitol Street Off-Ramp	56,901	56,896	6.0%	6.0%	3,410	3,410	0
at South Capitol Street	49,339	48,434	6.0%	6.0%	2,960	2,910	-50
upstream of Virginia Avenue Off-Ramp	70,289	69,226	6.0%	6.0%	4,220	4,150	-70
I-395 Westbound							
upstream of I-395 SB On-Ramp	61,920	61,592	4.0%	4.0%	2,480	2,460	-20
at South Capitol Street	52,543	53,489	4.0%	4.0%	2,100	2,140	40
downstream of Virginia Avenue On-Ramp	67,444	68,755	4.0%	4.0%	2,700	2,750	50
New Jersey Avenue Northbound							
between D Street and E Street	1,509	1,613	2.0%	2.0%	30	30	0

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
between E Street and I Street	1,720	2,226	2.0%	2.0%	30	40	10
between I Street and K Street	1,231	1,362	2.0%	2.0%	20	30	10
between K Street and L Street	1,322	1,341	2.0%	2.0%	30	30	0
between L Street and M Street	1,367	1,357	2.0%	2.0%	30	30	0
New Jersey Avenue Southbound							
between D Street and E Street	1,693	1,631	2.0%	2.0%	30	30	0
between E Street and I Street	1,797	1,575	2.0%	2.0%	40	30	-10
between I Street and K Street	980	938	2.0%	2.0%	20	20	0
between K Street and L Street	936	881	2.0%	2.0%	20	20	0
between L Street and M Street	866	845	2.0%	2.0%	20	20	0
I Street Eastbound							
between Half St SW and South Capitol Street	3,249	2,204	2.0%	2.0%	60	40	-20
between South Capitol Street and Half St SE	2,230	2,188	2.0%	2.0%	40	40	0
between Half St SE and First Street SE	2,552	2,659	2.0%	2.0%	50	50	0
between First Street SE and New Jersey Avenue SE	2,630	2,879	2.0%	2.0%	50	60	10
I Street Westbound							
between Half St SW and South Capitol Street	3,191	2,712	2.0%	2.0%	60	50	-10
between South Capitol Street and Half St SE	8,114	5,528	2.0%	2.0%	160	110	-50
between Half St SE and First Street SE	6,323	4,747	2.0%	2.0%	130	90	-40
between First Street SE and New Jersey Avenue SE	2,993	2,601	2.0%	2.0%	60	50	-10
K Street Eastbound							
between Half St SW and South Capitol Street	3,618	2,005	2.0%	2.0%	70	40	-30
between South Capitol Street and Half St SE	2,230	1,852	2.0%	2.0%	40	40	0

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
between Half St SE and First Street SE	795	833	2.0%	2.0%	20	20	0
between First Street SE and New Jersey Avenue SE	1,032	1,032	2.0%	2.0%	20	20	0
K Street Westbound							
between Half St SW and South Capitol Street	1,754	1,428	2.0%	2.0%	40	30	-10
between South Capitol Street and Half St SE	915	2,549	2.0%	2.0%	20	50	30
between Half St SE and First Street SE	940	975	2.0%	2.0%	20	20	0
between First Street SE and New Jersey Avenue SE	1,127	1,000	2.0%	2.0%	20	20	0
L Street Eastbound							
between Half St SW and M Street Off-Ramp	158	1,507	2.0%	2.0%	0	30	30
between M Street On-Ramp and Half St SE	696	1,402	2.0%	2.0%	10	30	20
between Half St SE and First Street SE	774	748	2.0%	2.0%	20	10	-10
between First Street SE and New Jersey Avenue SE	1,054	1,027	2.0%	2.0%	20	20	0
L Street Westbound							
between Half St SW and M Street Off-Ramp	470	1,428	2.0%	2.0%	10	30	20
between M Street On-Ramp and Half St SE	1,391	996	2.0%	2.0%	30	20	-10
between Half St SE and First Street SE	1,966	2,224	2.0%	2.0%	40	40	0
between First Street SE and New Jersey Avenue SE	1,219	1,086	2.0%	2.0%	20	20	0
M Street Eastbound							
between Half St SW and South Capitol Street	25,218	24,779	9.0%	7.0%	2,270	1,730	-540
between South Capitol Street and Half St SE	22,711	22,814	9.0%	7.0%	2,040	1,600	-440
between Half St SE and First Street SE	19,112	18,946	9.0%	7.0%	1,720	1,330	-390
between First Street SE and New Jersey Avenue SE	20,878	19,623	9.0%	7.0%	1,880	1,370	-510

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
M Street Westbound							
between Half St SW and South Capitol Street	22,149	23,407	11.0%	9.0%	2,440	2,110	-330
between South Capitol Street and Half St SE	20,639	19,861	11.0%	9.0%	2,270	1,790	-480
between Half St SE and First Street SE	18,204	16,806	11.0%	9.0%	2,000	1,510	-490
between First Street SE and New Jersey Avenue SE	21,344	19,797	11.0%	9.0%	2,350	1,780	-570
N Street Eastbound							
between Half St SW and South Capitol Street	one-way	2,028	0.0%	2.0%	n.a	40	NA
between South Capitol Street and Half St SE	3,027	2,086	2.0%	2.0%	60	40	-20
between Half St SE and First Street SE	1,722	968	2.0%	2.0%	30	20	-10
N Street Westbound							
between Half St SW and South Capitol Street	1,389	1,378	2.0%	2.0%	30	30	0
between South Capitol Street and Half St SE	2,268	1,435	2.0%	2.0%	50	30	-20
between Half St SE and First Street SE	1,106	797	2.0%	2.0%	20	20	0
O Street Eastbound							
between Half St SW and South Capitol Street	one-way	1,652	0.0%	2.0%	n.a	30	NA
O Street Westbound							
between Half St SW and South Capitol Street	968	1,178	2.0%	2.0%	20	20	0
P Street Eastbound							
between Half St SW and South Capitol Street	3,345	2,091	2.0%	2.0%	70	40	-30
P Street Westbound							
between Half St SW and South Capitol Street	1,096	944	2.0%	2.0%	20	20	0

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
Potomac Avenue Eastbound							
between Half St SW and South Capitol Street	7,519	6,766	2.0%	2.0%	150	140	-10
between South Capitol Street and First St SE	5,506	5,338	2.0%	2.0%	110	110	0
Potomac Avenue Westbound							
between Half St SW and South Capitol Street	7,304	5,744	2.0%	2.0%	150	110	-40
between South Capitol Street and First St SE	3,282	4,080	2.0%	2.0%	70	80	10
Sumner Road Eastbound							
between Firth Sterling Avenue and Martin Luther King Jr. Avenue	2,896	2,716	2.0%	2.0%	60	50	-10
between Martin Luther King Jr. Avenue and Dunbar Road	2,306	523	2.0%	2.0%	50	10	-40
Sumner Road Westbound							
between Firth Sterling Avenue and Martin Luther King Jr. Avenue	2,907	2,248	2.0%	2.0%	60	40	-20
between Martin Luther King Jr. Avenue and Dunbar Road	55	9	2.0%	2.0%	0	0	0
Martin Luther King Jr. Avenue Northbound							
south of Sumner Road	14,372	15,557	6.0%	4.0%	860	620	-240
Sumner Road and Howard Road	11,680	15,788	6.0%	4.0%	700	630	-70
north of Howard Road	5,157	5,467	2.0%	2.0%	100	110	10
Martin Luther King Jr. Avenue Southbound							
south of Sumner Road	14,079	16,271	4.0%	4.0%	560	650	90
Sumner Road and Howard Road	13,646	8,112	4.0%	4.0%	550	320	-230
north of Howard Road	8,575	6,977	2.0%	2.0%	170	140	-30

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
Howard Road Eastbound							
between Suitland Parkway and I-295 Southbound Off-Ramp	1,772	2,842	2.0%	2.0%	40	60	20
between I-295 Southbound Off-Ramp and Firth Sterling Avenue	8,219	2,842	2.0%	2.0%	160	60	-100
between Firth Sterling Avenue and Martin Luther King Jr. Avenue	8,039	3,106	2.0%	2.0%	160	60	-100
Howard Road Westbound							
between Suitland Parkway and I-295 Southbound Off-Ramp	3,116	2,550	2.0%	2.0%	60	50	-10
between I-295 Southbound Off-Ramp and Firth Sterling Avenue	1,733	2,550	2.0%	2.0%	30	50	20
between Firth Sterling Avenue and Martin Luther King Jr. Avenue	10,901	3,642	2.0%	2.0%	220	70	-150
Firth Sterling Avenue Northbound							
between Defense Boulevard and Sumner Road	5,144	5,470	8.0%	10.0%	410	550	140
between Sumner Road and Suitland Parkway	7,748	6,487	8.0%	10.0%	620	650	30
between Suitland Parkway and Howard Road	4,515	2,902	6.0%	6.0%	270	170	-100
between Howard Road and I-295 NB	10,361	n.a	6.0%	0.0%	620	n.a	NA
Firth Sterling Avenue Southbound							
between Defense Boulevard and Sumner Road	5,046	5,086	8.0%	7.0%	400	360	-40
between Sumner Road and Suitland Parkway	6,073	5,377	8.0%	7.0%	490	380	-110
between Suitland Parkway and Howard Road	3,502	3,734	6.0%	6.0%	210	220	10
between Howard Road and I-295 NB	n.a	n.a	0.0%	0.0%	n.a	n.a	NA

Roadway and Direction	2040 AADT		Truck Percentages		Truck Volumes		Change between No Build and Build Truck Volumes
Segment Details	SDEIS No-Build	SDEIS Build	SDEIS No-Build	SDEIS Build	SDEIS 2040 No-Build	SDEIS 2040 Build	
Ramps in the vicinity of South Capitol St project							
off-ramp from EB I-695 to SB South Capitol St	7,562	8,462	7.5%	7.5%	570	630	60
off-ramp from 3rd St Tunnel to SB South Capitol St	11,214	11,572	7.5%	7.5%	840	870	30
off-ramp from SB South Capitol St to M St	4,528	n.a	7.5%	n.a	340	n.a	NA
on-ramp from M St to SB South Capitol St	6,876	n.a	7.5%	n.a	520	n.a	NA
off-ramp from NB South Capitol St to M St	7,875	n.a	7.5%	n.a	590	n.a	NA
on-ramp from M St to NB South Capitol St	6,523	n.a	7.5%	n.a	490	n.a	NA
off-ramp from NB I-295 to Suitland Pkwy	n.a	6,910	n.a	7.5%	n.a	520	NA
on-ramp from Suitland Pkwy to NB I-295	n.a	21,646	n.a	7.5%	n.a	1,620	NA
off-ramp from SB I-295 to Suitland Pkwy (NB and SB)	n.a	18,952	n.a	7.5%	n.a	1,420	NA
off-ramp from SB Suitland Pkwy to MLK Jr. Ave	n.a	10,588	n.a	7.5%	n.a	790	NA
on-ramp from MLK Jr. Ave to SB Suitland Pkwy	n.a	2,464	n.a	7.5%	n.a	180	NA
off-ramp from NB Suitland Pkwy to MLK Jr. Ave	n.a	2,952	n.a	7.5%	n.a	220	NA
on-ramp from MLK Jr. Ave to NB Suitland Pkwy	n.a	11,473	n.a	7.5%	n.a	860	NA
on-ramp from South Capitol St to WB I-695	9,378	8,103	7.5%	7.5%	700	610	-90
Washington Ave SW Northbound							
between D St and South Capitol St	18,265	16,951	14.0%	14.0%	2,560	2,370	-190
Washington Ave SW Southbound							
between D St and South Capitol St	10,595	11,737	13.0%	13.0%	1,380	1,530	150

3.6 MSAT Assessment

Based on the recommended tiering approach, the project falls within the Tier 2 approach, as it does not:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000 or greater by the design year.

As such, the amount of MSATs emitted would be proportional to the VMT assuming the vehicle mix does not change. The Build Alternative is predicted to decrease regional VMT by 0.3 percent. These small changes cannot be considered measurable, thus the project is predicted to generally produce no meaningful MSAT effects.

The reconfigured travel lanes contemplated as part of the Build Alternative may have the effect of moving some traffic closer to nearby homes, schools and businesses. As a result, there may be localized areas where ambient concentrations of MSATs could be higher under the Build Alternatives than under the No Build Alternative. Locations that may experience this include areas near Suitland Parkway and the Naval Station. When new travel lanes are constructed, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, the USEPA's vehicle and fuel regulations coupled with fleet turnover will cause region-wide MSAT levels to be substantially lower than today in almost all cases.

Sensitive receptors include those facilities most likely to contain large concentrations of the more sensitive population. These include hospitals, schools, licensed day cares, and elder care facilities. Dispersion studies have shown that the "roadway" air toxics start to drop off at about 100 meters (328 feet). By 500 meters (1,640 feet), most studies have found it difficult to distinguish the roadway from background toxic concentrations in any given area.

Regardless of the alternative, emissions would likely be lower than present levels in the design year as a result of the USEPA's national control programs that are projected to reduce MSAT emissions by 83 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future in nearly all cases.

Due to the MSATs analysis limitations, the following discussion is included in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22[b]) regarding incomplete or unavailable information.

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The USEPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (USEPA, *http://www.epa.gov/iris/*). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's *Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents*. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, *http://pubs.healtheffects.org/view.php?id=282*) or in the future as vehicle emissions substantially decrease (HEI, *http://pubs.healtheffects.org/view.php?id=306*).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts. Each of these is a step in the process which build on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable. There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (*http://pubs.healtheffects.org/view.php?id=282*). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The USEPA

(*http://www.epa.gov/risk/basicinformation.htm#g*) and the HEI (*http://pubs.healtheffects.org/getfile.php?u=395*) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the USEPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires USEPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld USEPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

In this technical report, FHWA has provided a qualitative analysis of MSAT emissions relative to the alternatives. The FHWA also has acknowledged that the project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

3.7 Microscale Assessment

Maximum one-hour and eight-hour CO levels were predicted at receptor sites along the South Capitol Street Corridor. Maximum existing, 2020 and 2040 one-hour CO concentrations are shown in Table 7. Maximum eight-hour CO concentrations for existing, 2020 and 2040 are shown in Table 8. MOVES2010b data used in the CO analysis is contained in Appendix A. CAL3QHC (Version 2) input and output information for each site is contained in Appendix B. As shown in these tables, no violations of the NAAQS are predicted under the No Build and Build alternatives.

Table 7: Predicted Worst-Case 1-hour 2020 and 2040 CO Concentrations (ppm)

Site #	Site Description	Existing		SDEIS 2020 No Build Alternative		SDEIS 2020 Build Alternative		SDEIS 2040 No Build Alternative		SDEIS 2040 Build Alternative	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Southbound I-395 and Ramp to SE-SW Freeway	4.5	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
2	North Carolina Avenue SE and 1st Street SE	4.1	4.2	3.9	3.9	4.0	3.8	3.8	3.9	3.9	3.8
3	M Street and South Capitol Street	5.5	4.9	4.7	4.7	4.8	4.8	4.6	4.8	4.6	4.7
4	N Street and South Capitol Street	5.0	5.1	4.4	4.4	4.6	4.4	4.4	4.3	4.6	4.6
5	South Capitol Street West Oval at Potomac Avenue	5.1	6.1	4.5	4.7	4.7	5.1	4.5	4.7	4.4	4.4
6	Q Street, Potomac Avenue, and South Capitol Street	5.4	5.1	4.6	4.5	4.8	5.1	4.5	4.5	4.6	4.5
7	South Capitol Street at East Oval including Howard Road and Suitland Parkway	5.1	5.2	4.5	4.6	4.9	4.6	4.5	4.5	4.8	4.6
8	Defense Road, Firth Sterling South Capitol Street	5.5	5.4	4.5	4.6	5.1	4.5	4.4	4.6	5.1	4.5
9	SB I-295 Off Rampand Suitland Parkway	5.1	4.8	4.5	4.5	4.5	4.7	4.4	4.6	4.4	4.7
10	NB I-295 off ramp to Suitland Parkway, Firth Sterling Avenue	4.6	4.8	4.1	4.3	4.8	5.0	4.2	4.3	4.6	4.8

Note: Concentrations include one hour CO background = 3.7 ppm, One hour CO Standard = 35 ppm

Table 8: Predicted Worst-Case 8-Hour 2020 and 2040 CO Concentrations (ppm)

Site #	Site Description		2020		2040	
		Existing	SDEIS No Build	SDEIS Build	SDEIS No Build	SDEIS Build
1	Southbound I-395 and Ramp to SE-SW Freeway	3.7	3.4	3.4	3.4	3.4
2	North Carolina Avenue SE and 1st Street SE	3.5	3.2	3.3	3.2	3.2
3	M Street and South Capitol Street	4.4	3.8	3.9	3.9	3.8
4	N Street and South Capitol Street	4.1	3.6	3.7	3.6	3.7
5	South Capitol Street West Oval at Potomac Avenue	4.8	3.8	4.1	3.8	3.6
6	Q Street, Potomac Avenue, and South Capitol Street	4.3	3.7	4.1	3.7	3.7
7	South Capitol Street at East Oval including Howard Road and Suitland Parkway	4.2	3.7	3.9	3.7	3.9
8	Defense Road, Firth Sterling South Capitol Street	4.4	3.7	4.1	3.7	4.1
9	SB I-295 Off Ramp and Suitland Parkway	4.1	3.7	3.8	3.7	3.8
10	NB I-295 off ramp to Suitland Parkway, Firth Sterling Avenue	3.9	3.5	4.0	3.5	3.9

Note: Concentrations include eight-hour CO background = 3.1 ppm, eight-hour CO Standard = 9 ppm

4.0 Construction Impacts on Air Quality

Construction-related effects of the Project would be limited to short-term increased fugitive dust and mobile-source emissions during construction. State and local regulations regarding dust control and other air quality emission reduction controls should be followed.

4.1 Fugitive Dust Emissions

Fugitive dust is airborne particulate matter, generally of a relatively large particulate size. Construction-related fugitive dust would be generated by haul trucks, concrete trucks, delivery trucks, and earth-moving vehicles operating around the construction sites. This fugitive dust would be due primarily to particulate matter re-suspended ("kicked up") by vehicle movement over paved and unpaved roads, dirt tracked onto paved surfaces from unpaved areas at access points, and material blown from uncovered haul trucks.

Generally, the distance that particles drift from their source depends on their size, the emission height, and the wind speed. Small particles (30 – 100 micron range) can travel several hundred feet before settling to the ground. Most fugitive dust, however, is comprised of relatively large particles (that is, particles greater than 100 microns in diameter). These particles are responsible for the reduced visibility often associated with this type of construction. Given their relatively large size, these particles tend to settle within 20 to 30 feet of their source.

In order to minimize the amount of construction dust generated, the guidelines below should be followed. The following preventive and mitigative measures, consistent with the *DDOT Division 100 General Requirements*, should be taken to minimize the potential particulate pollution problem:

4.1.1 Site Preparation

- Minimize land disturbance.
- Use watering trucks to minimize dust.
- Cover trucks when hauling dirt.
- Stabilize the surface of dirt piles if they are not removed immediately.
- Use windbreaks to prevent accidental dust pollution.
- Limit vehicular paths and stabilize these temporary roads.
- Pave all unpaved construction roads and parking areas to road grade for a length no less than 50 feet from where such roads and parking areas exit the construction site. This prevents dirt from washing onto paved roadways.

4.1.2 Construction

- Cover trucks when transferring materials.
- Use dust suppressants on unpaved traveled paths.
- Minimize unnecessary vehicular and machinery activities.
- Minimize dirt track-out by washing or cleaning trucks before leaving the construction site. An alternative to this strategy is to pave a few hundred feet of the exit road just before entering the public road.

4.1.3 Post-Construction

- Re-vegetate any disturbed land not used.
- Remove unused material.
- Remove dirt piles.
- Re-vegetate all vehicular paths created during construction to avoid future off-road vehicular activities.

4.2 Mobile Source Emissions

Since CO emissions from motor vehicles generally increase with decreasing vehicle speed, disruption of traffic during construction (such as the temporary reduction of roadway capacity and the increased queue lengths) could result in short-term, elevated concentrations of CO. In order to minimize the amount of emissions generated, every effort should be made during the construction phase to limit disruption to traffic, especially during peak travel hours.

5.0 Conclusions

The project is part of the approved 2013 *Financially Constrained Long-Range Transportation Plan* as well as part of the approved 2013-2018 *Transportation Improvement Plan.* As such, it is part of the region's plan to achieve their air quality goals. The SDEIS Build Alternative is predicted to decrease regional VMT by 0.03 percent, as compared to the SDEIS No Build Alternative. This small change cannot be considered measurable. The project is therefore not expected to measurably affect project level emission burdens, including greenhouse gases, or to cause a violation of the $PM_{2.5}$ standard. The project is also not expected to measurably increase MSAT levels. The project is not predicted to cause or exacerbate a violation of the NAAQS.

Construction-related effects of the project would be limited to short-term increased fugitive dust and mobile-source emissions during construction. District regulations regarding dust control and other air quality emission reduction controls would be followed.

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THE FOLLOWING APPENDICES ARE AVAILABLE UPON REQUEST TO DDOT.

APPENDIX A
MOVES2010b DATA

APPENDIX B
CAL3QHC INPUT & OUTPUT FILES

District Department of Transportation

appendix D

noise technical report

february 2011

PARSONS BRINCKERHOFF

FINAL NOISE TECHNICAL REPORT

February 2014

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1.0 Introduction

The District of Columbia Department of Transportation (DDOT), in cooperation with the Federal Highway Administration (FHWA) is proposing transportation improvements in the South Capitol Street Corridor in the District of Columbia. The focus of the South Capitol Street project includes improvements within the South Capitol Street Corridor between Suitland Parkway at Martin Luther King, Jr. Avenue and Independence Avenue, including the replacement of the Frederick Douglass Memorial Bridge. The project also includes improvements along New Jersey Avenue between M Street, SE and D Street, SE.

A Supplemental Draft Environmental Impact Statement (SDEIS) is being prepared to examine the proposed changes to the South Capitol Street Project (the Project) as described in the FEIS released in March 2011. Decisions about the Project made since approval of the 2011 FEIS resulted in major changes to the design of the project. The most notable decision was to reconsider obtaining right-of-way within the northernmost portion of the Joint Base Anacostia Bolling (JBAB) for the Project. This decision resulted in additional engineering to set the proposed new Frederick Douglass Memorial Bridge on an alignment immediately south of and parallel to the existing bridge. In addition, new information about current and planned navigation, including the navigation requirements of the U.S. Navy along the Anacostia River influenced the decision to include a fixed bridge among the Project alternatives.

As part of the Draft Environmental Impact Study (DEIS) finalized in 2008, a Noise Technical Report was completed in September 2007. The 2007 Noise Technical Report documented the evaluation of the Project's feasible alternatives and determined highway traffic noise impact based on those alternatives. This noise analysis also supported the findings of the 2011 FEIS.

This SDEIS Noise Report provides an update of the noise analysis for the preferred alternative to determine changes between the alternatives evaluated during the FEIS and the Revised Preferred Alternative. This report documents the evaluation of the Revised Preferred Alternative, identification of highway traffic noise impacts, and determination of appropriate feasible and reasonable noise mitigation measures. Potential noise impacts that would be expected to occur as a result of Revised Preferred Alternative were identified for construction and traffic operation of the South Capitol Street Project. This noise analysis predicted future noise levels (design year of 2040) for the Revised Preferred Alternative and compares those levels with existing noise levels and the DDOT noise abatement criteria (NAC).

The noise analysis was completed in accordance with FHWA traffic noise regulations, as prescribed in 23 CFR 772 (July 2011) and *Highway Traffic Noise Analysis Abatement Policy and Guidance* (January 2011), and in conformance to the DDOT *Noise Policy* (April 11, 2011). Traffic-related noise impacts evaluation consists of the following elements:

- Identification of existing activities. (Section 2.3)
- Measurement of existing noise levels. (Section 2.4)

- Prediction of future noise levels and identification of potential impacts. (Section 2.5)
- Evaluation of appropriate abatement measures. (Section 3.1)
- Qualitative assessment of potential short-term construction-related noise effects, and outline of potential measures procedures. (Section 4.0)

1.1 Setting

South Capitol Street was a primary corridor in L'Enfant's 1791 Plan for the City of Washington and has always been envisioned as a symbolic gateway to the city and its Monumental Core. South Capitol Street connects downtown Washington to neighborhoods in the southeast and southwest quadrants of the District of Columbia and Prince George's County, Maryland.

Today for most of its length, South Capitol Street is classified as a principal arterial between Independence Avenue and M Street and as an expressway/freeway between M Street and Firth Sterling Avenue SE. It was designed to carry high volumes of motor vehicle traffic through the corridor and it is a primary transportation link between the Monumental Core and the southeast and southwest neighborhoods of the District of Columbia, northern Virginia, and Prince George's County (Maryland). It is one of the District of Columbia's primary commuter routes, providing access between the District of Columbia, northern Virginia, and southern Maryland. Portions of South Capitol Street, including the Frederick Douglass Memorial Bridge, Interstate 295 (I-295) and Suitland Parkway are included on the National Highway System. In addition, DDOT has identified South Capitol Street and Suitland Parkway as emergency event/evacuation routes.

1.2 Purpose and Need

The purpose of the South Capitol Street project is to improve safety, accessibility, multimodal mobility and support economic development in the project area. The proposed transportation improvements incorporate long-term environmental sustainability and context sensitive design. Specifically, the project addresses the following needs:

- **Safety:** The design and deteriorating condition of the transportation infrastructure in the corridor creates safety concerns for motorists, bicyclists, pedestrians, and transit riders.
- **Mobility:** Missing critical regional roadway connections and the lack of facilities for bicyclists and pedestrians, establish the need to improve multimodal mobility in the South Capitol Street Corridor.
- **Accessibility:** There are several key destinations in or adjacent to the corridor, but these locations are difficult to reach using the existing transportation infrastructure. Grade separations, median barriers, and ramp and intersection configurations limit access to activity centers for motorists, bicyclists, pedestrians, and transit riders.

- **Economic Development:** The density of employment and residential development forecasted for the area demonstrate the need to support economic growth. Public-driven development will add jobs and create new residential neighborhoods.

1.3 Project Area

The South Capitol Street project area is located in the Southwest and Southeast quadrants of the District of Columbia adjacent to the Anacostia River (Figure 1). The northern boundary is at D Street at the US Capitol. The eastern boundary follows 2nd Street SE west of the Anacostia River and expands to the east of the Anacostia Metrorail station parking deck north of Interstate 295 east of the river. The western boundary is just west of 2nd Street from Independence Avenue SW from to T Street SW north of the Anacostia River and Mitscher Road SW in the Anacostia Naval Station. The Southern boundary of the project area is just south of the Barry Farms neighborhood (near the intersection of Wade and Stevens Roads SE) and includes a portion of St. Elizabeths West Campus.

1.4 No-Build and Preferred Alternative

1.4.1 No Build Alternative

The No Build Alternative for the South Capitol Street Project consists of the existing street conditions and transportation projects that will be completed by the design year 2040 within the project area. The No Build Alternative does not meet the Project purpose and need and therefore is not evaluated in the SDEIS.

1.4.2 Overview of Build Alternatives in the FEIS

As described in Chapter 2 of the FEIS, the alternatives development process for the Project consisted of four iterations of alternatives: the Initial Build Alternatives; the Preliminary Build Alternatives; the Build Alternatives evaluated in the DEIS; and the Build Alternatives evaluated in the FEIS. Each iteration of alternatives development included consideration of planning, engineering, and environmental input with public and agency comments. All of the build alternatives included a new bridge to replace the existing Frederick Douglass Memorial Bridge, with an alignment that slanted or skewed from the existing bridge alignment. The rationale for this skewed bridge alignment, in part, was to provide adequate clearance for operating the swing-span on the existing bridge during the new bridge construction. The Build Alternatives of the FEIS only included a movable type bridge for the replacement.

Figure 1: Project Study Area

1.4.3 Revised Preferred Alternative Description

The Revised Preferred Alternative presented in the SDEIS incorporates the design changes based on evaluations in the project area. For descriptive purposes, the proposed design changes to the Project are described by segments numbered 1 through 5 (Figure 2). Segment 1 includes the area over the Anacostia River, including the riverside areas immediately west and east of the river. Segment 2 includes I-295, but also the area where Suitland Parkway connects with South Capitol Street. Segment 3 includes Suitland Parkway east of Firth Sterling Avenue. Segment 4 includes South Capitol Street on the west side of the river from M Street to D Street, SE. Segment 5 encompasses the areas north of I-695 to Independence Avenue, but also includes New Jersey Avenue SE between M Street SE and D Street, SE.

Segment 1

Segment 1 encompasses the Anacostia River and the land areas immediately on both the west (near the Nationals Ballpark and Buzzard Point) and east (near Anacostia and Poplar Point) ends of the river. This segment includes the new Frederick Douglass Memorial Bridge.

The proposed new bridge alignment of the Revised Preferred Alternative would be located parallel to and approximately 30 feet from the south side or downstream from of the existing bridge superstructure. Similar to FEIS Preferred Alternative, the new proposed bridge under the Revised Preferred Alternative would support six travel lanes (three lanes in each direction), and bike/pedestrian paths. The bike/pedestrian paths would be located on opposite sides of the bridge, the same as what was proposed for the FEIS Preferred Alternative. However, each path would be approximately 18 feet wide, or two feet narrower than what was proposed in the FEIS. For each path, separate areas would be provided for cyclists and pedestrians. For cyclists, both paths would provide for two-way traffic.

The west end traffic oval was slightly reduced in size and would no longer require land from the Nationals Ballpark sidewalk and Reservation 245. The oval would still connect South Capitol Street, the new bridge, Potomac Avenue, G Street SW and R Street SW. On the west end of the bridge near the oval, the design could allow staircases to connect with the riverfront on both the north and south sides of the bridge.

The re-alignment of the proposed bridge necessitated a redesign of the traffic circle on the east end of the river to a traffic oval similar in size and scale to the traffic oval proposed on the west side of the river. The intention is to aesthetically match both the west and east end ovals. The east oval would be located completely within the DDOT right of way, and it would still allow connections between the new Frederick Douglass Memorial Bridge, and realigned South Capitol Street and Suitland Parkway.

Unlike the traffic circle proposed under the FEIS Preferred Alternative, the east traffic oval in the Revised Preferred Alternative would not directly connect~~ion~~ with Howard Road in the near term. Instead, the initial configuration of Howard Road would connect directly with Suitland Parkway. The east oval would sever the existing access roads into the Poplar Point section of Anacostia Park. To maintain park access, the northeast leg of the east oval would be used for both the park's ingress and egress at Poplar Point.

There are currently two design options for the Frederick Douglass Memorial Bridge. The first option is for a fixed span bridge and the second is for a moveable span.

Segment 2

Segment 2 encompasses I-295 and the area between this freeway and the proposed east traffic oval, including Suitland Parkway and South Capitol Street. The existing I-295 / Suitland Parkway Interchange would be modified from a partial cloverleaf interchange to an urban diamond interchange that would allow all movements between Suitland Parkway and I-295. The east side cloverleaf ramps would be removed and replaced with diamond ramps. A diamond ramp (Ramp B) would be provided for southbound I-295 to eastbound Suitland Parkway movements. The ramp would have a gradient of 6.5 percent to be within highway standards. The interchange modification would require replacing the I-295 bridge over Suitland Parkway and widening the southbound I-295 bridge over Howard Road SE for a ramp to Suitland Parkway. Suitland Parkway would be reconstructed from Firth Sterling Avenue SE to the proposed traffic circle. Firth Sterling Avenue would be reconstructed from Suitland Parkway to Howard Road SE.

Segment 2 will be completely built upon completion of Segment 3. The section of Suitland Parkway within Segment 2 will consist of three lanes in each direction when fully built. The eastbound side of Suitland Parkway will also have a sidewalk and bike path.

The I-295 bridges over Howard Road SE and Firth Sterling Avenue SE would also be replaced as they have been identified to be in poor condition. The bridge over Firth Sterling Avenue SE is also over an inactive railroad right-of-way owned by CSX Transportation, Inc. (CSX). Instead of bridging over the CSX right-of-way, the right-of-way would be replaced with earthen fill. Therefore, the new I-295 bridge over Firth Sterling Avenue SE would be shorter.

Segment 3

Segment 3 covers Suitland Parkway from Firth Sterling Avenue SE east to just south of Stanton Road SE. Suitland Parkway would be reconstructed from Firth Sterling Avenue SE to the segment of the Parkway just south of Stanton Road SE. This would include removing ramps connecting with Stanton Road SE and Sheridan Road SE. The Martin Luther King Jr. Avenue SE overpass would be converted into an urban diamond interchange where new ramps on both sides of the Suitland Parkway would provide for all possible movements between the Parkway and Martin Luther King Jr. Avenue SE. In addition, a sidewalk/bike path would be provided or upgraded along the north side of the reconstructed Suitland Parkway.

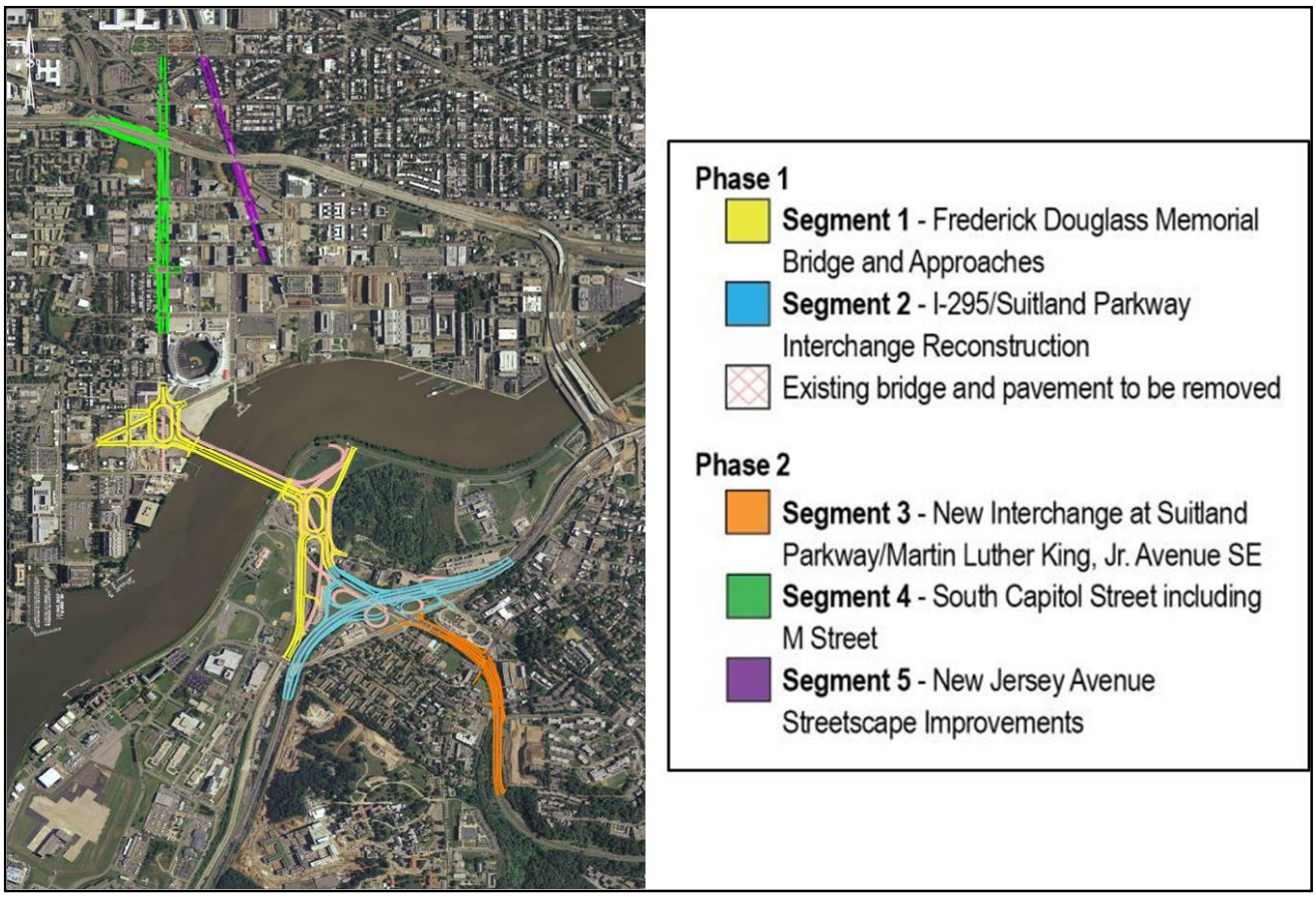


Figure 2: Segments of the South Capitol Street Project

Segment 4

Segment 4 covers South Capitol Street, north of the Anacostia River, from Potomac Avenue to D Street, SE. The South Capitol Street and M Street interchange would be converted to an at-grade intersection with left-turn bays. The intersection work would include reconstruction of M Street SW roughly between Half Street SE and Half Street SW. South Capitol Street from M Street to I Street would be converted into an urban boulevard, with wider sidewalks and modified intersections with L and K Streets to allow cross-street movements. The ramp carrying northbound South Capitol Street traffic to westbound I-695 located just north of the I Street intersection would be removed and replaced with an urban interchange ramp from South Capitol Street that would be located underneath the I-695 Viaduct.

The segment of South Capitol Street north of I Street would be reconstructed due to the elimination of the northbound ramp. The eastbound Southeast-Southwest Freeway off-ramp to southbound South Capitol Street would be modified to an urban interchange ramp with South Capitol Street. The modified ramp would require a signalized

intersection with South Capitol Street. It could allow right-of-way occupied by the old ramp to be used for slightly expanding the size of Randall Recreation Center. Other changes to the design include minor modifications to lane configurations along South Capitol Street. An enhanced streetscape, including pedestrian amenities, would be provided on South Capitol Street from I-695 to Independence Avenue.

Segment 5

Segment 5 New Jersey Avenue SE between M Street SE and D Street, SE. An enhanced streetscape would be provided along New Jersey Avenue SE between M Street SE and D Street, SE. Within the segment between M Street SE and I-695, the full 160-foot right-of-way would be restored.

2.0 Traffic Noise Analysis

2.1 Sound Descriptors

Noise levels are measured in units called decibels. The human ear does not respond equally to all frequencies (or pitches), so measured noise levels are often adjusted or weighted to correspond to human response to the range of sound frequencies and the perception of loudness. To achieve this adjustment, noise measuring instruments incorporate an electronic weighting process to simulate the subjective response of the human ear. One of the commonly used weightings in noise measurement equipment (sound level meter) is called “A-weighting,” and the resultant noise level as measured by a sound level meter is called the “A-weighted sound level” (dBA).

Traffic noise levels are expressed in terms of hourly equivalent continuous noise level which is abbreviated as L_{eq} (1-hr) dBA. The L_{eq} (1-hr) is defined as the equivalent steady-state sound level that, in a period of one hour, contains the same acoustic energy as the time-varying sound level during that hour. This descriptor correlates well with human response to changes in noise levels. The one-hour equivalent noise level during the loudest traffic hour, expressed as L_{eq} (1-hr) dBA, is used by FHWA and DDOT as the descriptor for assessing the effects of traffic noise. Measurement of existing noise level, prediction of future noise levels, and noise impact assessments contained in this report were evaluated using the L_{eq} (1-hr) dBA descriptor.

2.1.1 Human Perception of Changes in Noise Levels

Noise is unwanted sound as defined by the FHWA *Highway Traffic Noise Analysis Abatement Policy and Guidance*. Environmental noise varies from place to place; it also varies during different time periods consistent with the daily cycle of human activities. For reference and orientation to the decibel scale, representative environmental noise sources and their respective dBA levels are shown in Table 1 and Figure 3.

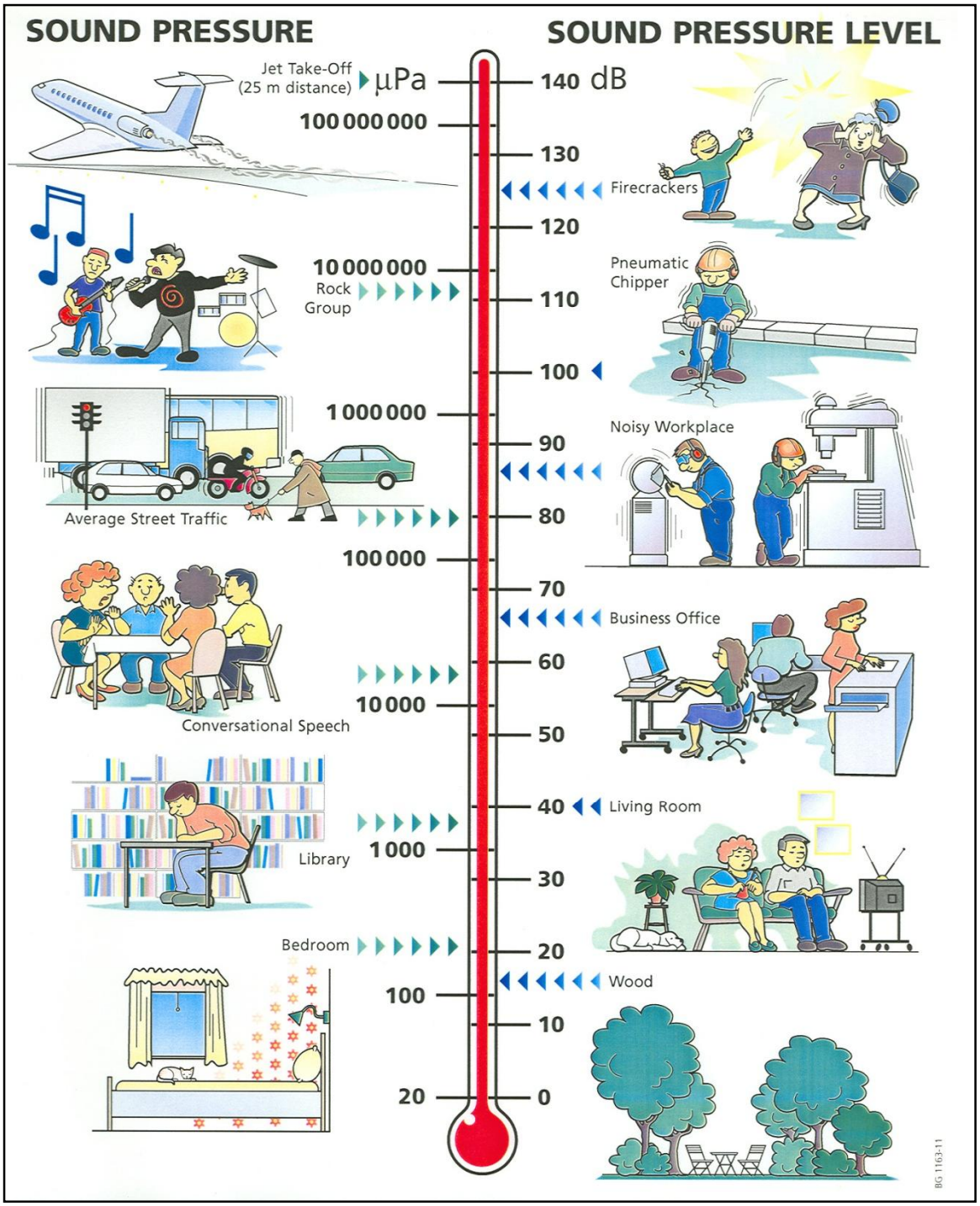
The average individual’s ability to perceive changes in community noise levels is well documented. Generally, changes in noise levels on the order of 3 dBA or less will be barely noticed by most listeners, a change of 5 dBA is readily perceptible, whereas a 10 dBA change will be perceived as doubling (or halving) of loudness. The general principle on which most noise acceptability criteria is based is that an increase in noise level is

likely to affect speech intelligibility whenever such increase intrudes upon the existing noise from all other sources.

Table 1: Common Noise Levels and Typical Reactions

Sound Source	Noise Level (dBA)	Apparent Loudness	Typical Reaction
Military jet, Air raid siren	130	64x as loud	Limit amplified speech
Amplified rock music	110	16x as loud	Maximum vocal effort
Jet takeoff at 500 meters	100	8x as loud	Cover ears extreme annoyance
Freight train at 15 meters	95	6x as loud	Very annoying
Heavy truck at 15 meters, Busy city street	90	4x as loud	Very annoying
Busy traffic intersection	80	2x as loud	Annoying
Highway traffic at 15 meters	70	Base reference	Telephone use difficult
Light car traffic at 15 meters	60	½ as loud	Intrusive
Noisy office	50	¼ as loud	Beginning of speech interference
Public library	40	$^{1}/_{8}$ as loud	Quiet
Soft whisper at 5 meters	30	$^{1}/_{16}$ as loud	Very quiet
Threshold of hearing	10	$^{1}/_{62}$ as loud	Just audible

Source: Road and Rail Noise: Effects on Housing, Canada Mortgage and Housing Corporation (1981)



Source: Brüel and Kjær. Environmental Noise, Sound and Vibration Measurements (2000)

Figure 3: Sound Pressure and Sound Pressure Levels

2.2 Criteria for Determining Noise Impacts

The basic goals of noise criteria, as they apply to transportation projects, are to minimize the adverse noise impacts on the community and, where necessary, to provide feasible and reasonable measures to abate noise impacts.

FHWA regulations 23 CFR 772 contain the Noise Abatement Criteria (NAC), which represent the upper limit of highway traffic L_{eq} (1-hr) noise levels for exterior land uses and activities, and also for certain indoor activities. The NAC represents the noise impact criteria level above which traffic noise will begin to intrude on the existing noise environment for a given land use. FHWA and DDOT traffic noise abatement criteria are presented in Table 2.

Table 2: Noise Abatement Criteria for Highway Projects

Activity Category	Activity Criteria Leq(h)	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quietness of extraordinary significance serve an important public purpose and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	Exterior	Residential
C	67	Exterior	Active spot areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, busy yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retails facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

Source: Federal Highway Administration 23 CFR 772 and DDOT Noise Policy (2011).

Federal regulations state that: "noise impacts occur when the predicted traffic noise levels approach or exceed the NAC levels or when the predicted traffic noise levels substantially exceed the existing noise levels." Accordingly, the DDOT Noise Policy indicates that a traffic noise impact occurs when predicted noise levels approach or exceed the NAC, or when the predicted future noise levels substantially exceed existing noise levels. DDOT defines "approach noise level" as 1 dBA below the NAC. For example, for receptor sites falling under FHWA Category "B" land use (Table 2), an impact is considered to have occurred when exterior traffic noise level within the project is equal to or exceed a L_{eq} (1-hr) of 66 dBA (i.e., 1 dBA less than the NAC of 67 dBA for that category of land use). For interior spaces falling under FHWA land use "Category B," a noise impact is considered to have occurred when the interior noise level within the project is equal to or exceeds a L_{eq} (1-hr) of 51 dBA.

In addition to the NAC criteria presented in Table 2, a traffic noise impact can occur when future noise levels resulting from the Build Alternative exceed existing noise levels by a substantial margin. DDOT guidelines define a substantial noise increase as an increase in noise levels of 10 decibels or more in the design year over the existing noise level. This guideline is derived on the basis of interference with speech communication. Minor speech interference occurs when build noise levels rise in the 5 to 10 decibel range and moderate interference can be expected to occur when build noise levels increase by 10 to 15 decibels. Noise level increases of less than 5 decibels will not affect speech intelligibility.

2.3 Existing Activities

2.3.1 Land Use Activities

The DDOT Noise Policy recommends an inventory of existing/planned land uses to identify existing activities. Also, undeveloped lands within the project area are further investigated to determine if there is a commitment to develop the property (typically by issuance of a building permit).

Land uses within the project area were identified through field visits in August 2013 and use of recent aerials, topographic maps, the District of Columbia DC Atlas Plus on-line mapping tool, and Capitol Riverfront Business Improvement District project inventory (August 2013). Noise activity categories from Table 2 were assigned to appropriate land uses within the project area. Vacant properties with known future land use, or undeveloped properties, were further researched to determine if there is a commitment to develop the property and the appropriate noise activity category was assigned to these land uses.

Table 3 details how the project area was divided geographically into twelve common noise environments (CNEs) and describes the corresponding land use and noise activity categories for the noise-sensitive receptors within each. The CNEs were selected based on how project traffic volumes were graphically presented in a spreadsheet, which were identified based on changes in traffic related to land use activities. The spreadsheet which presents Project traffic volumes is referenced in Appendix D. The CNEs throughout the project area are listed beginning from south to north:

1. Suitland Parkway between west of Stanton Road SE and Martin Luther King Jr. Avenue SE;
2. Suitland Parkway between Martin Luther King Jr. Avenue SE and I-295;
3. Suitland Parkway between I-295 and South Capitol Street;
4. I-295 between south of Defense Boulevard and 11th Street Bridge exit;
5. South Capitol Street between south of Defense Boulevard and Potomac Avenue;
6. South Capitol Street between Potomac Avenue and N Street;
7. South Capitol Street between N Street and M Street;
8. South Capitol Street between M Street and I Street;
9. South Capitol Street between I Street and Southeast-Southwest Freeway (I-395);
10. South Capitol Street between I-395 and Independence Avenue;
11. New Jersey Avenue between M Street and I-395; and
12. New Jersey Avenue between I-395 and Independence Avenue.

Table 3: Land Use Activities

Location	Activity	Identified Categories
CNE-1 Suitland Parkway between west of Stanton Road SE and Martin Luther King Jr. Avenue SE	• Land uses on the west side include Martin Luther King Child Development Center (south of Pomeroy Road), multi-story townhomes (along Pomeroy Road), Parkway House (multi-story apartments north of Pomeroy Road), Matthews Memorial Baptist Church campus (south of Stanton Road SE - includes multi-story apartment, playground and educational center), the Campbell AME Church campus (north of Stanton Road SE - includes a church and residence), and churches adjacent to the west side of Martin Luther King Jr. Avenue SE. • Land uses on the east side include multi-story single family homes (south of Pomeroy Road), Sayles Place Cooperative (multi-story apartments with playground and basketball court on both sides of Pomeroy Road), Macedonia Baptist Church on Stanton Road SE, single-family residences north of Bowen Road, multi-story apartments (Oxford Manor) south of Bowen Road, Sheridan Station (multi-story condominiums and apartments and playground at the northeast quadrant of Sheridan Road and Bowen Road, Children's Center on Sheridan Road, Bethlehem Baptist Church and Dr. Calvin W. Rolark Memorial Building (both on Howard Road SE south of Martin Luther King Jr. Avenue SE). • A large vacant property east of Sheridan Road between Pomeroy Road and Bowen Road was observed to be	B/C/G

Table 3: Land Use Activities

Location	Activity	Identified Categories
	under construction during the field visit in August 2013 (no permit - Category G). However, what appears to be construction associated with residential development was observed during the field visit. Two Category B noise receptors were provided in the front and back of the property.	
CNE-2 Suitland Parkway between Martin Luther King Jr. Avenue SE and I-295	• Land uses on the west side include Excel Academy (former Birney School – north side of Martin Luther King Jr. Avenue SE), Barry Farm facilities (including pavilion, basketball courts, baseball field and outdoor swimming pool) and housing (multi-story multi-family residences), and single-family residences and multi-story apartments west of Sumner Road. • Barry Farm's baseball field was observed to be under construction during the field visit in August 2013, and signs indicate this is the future location of a multi-story building Barry Farm Recreation Center. • Land uses on the east side include the Anacostia Metro Station, United House of Prayer for All People Church (adjacent to Suitland Parkway), A. Kiger Savoy School (west of Howard Road SE – includes playground and basketball court), and Thurgood Marshall Academy.	B/C/F
CNE-3 Suitland Parkway between I-295 and South Capitol Street	• Land uses on the west side include DDOT-owned properties used for parking and maintenance operations. • Land uses on the east side include the Washington D.C. Mental Health building and Howard Road Academy and playground, single-family residences, industrial buildings, a parking structure for the Anacostia Metro Station (currently Category F but planned for residential redevelopment – Category B), and vacant properties (no future land use/permit - Category G) adjacent to Anacostia Park on Howard Road SE. Category B noise receptors were provided for these properties based on information that adjacent properties likely are planned for residential developments.	B/C/F/G

Table 3: Land Use Activities

Location	Activity	Identified Categories
CNE-4 I-295 between south of Defense Boulevard and 11th Street Bridge exit	• Land uses west of Suitland Parkway include the Joint Bolling Air Base JBAB, multi-story apartments on the south side of Firth Sterling Avenue SE and Verizon building. • Land uses east of Suitland Parkway include offices and parking structure at Anacostia Park, and St. Philips Episcopal Church, multi-story apartments, townhomes and single-family residences all located south of I-295 along Shannon Place SE.	B/C/F
CNE-5 South Capitol Street between south of Defense Boulevard and Potomac Avenue	• Land uses on the west side include the JBAB office buildings and outdoor recreational facilities (baseball field, tennis courts, park benches and pavilions), DDOT-owned property used for maintenance operations and the Superior Concrete property (north of the Anacostia River). • Land uses on the east side include DDOT-owned properties used for parking and maintenance operations, Anacostia Park, and vacant property north of the Anacostia River (future mixed residential/commercial development Riverfront on the Anacostia).	B/C/E/F
CNE-6 South Capitol Street between Potomac Avenue and N Street	• Land uses on the west side include industrial/automotive buildings north of Potomac Avenue, U-Haul (south side of P Street), multi-story townhomes at the northeast quadrant of Half Street and Q Street, Syphax Gardens Apartments (at the southwest quadrant of Half Street and P Street), multi-story townhomes between P Street and O Street, Camden South Capitol Apartments (north of O Street), multi-story townhomes on Half Street, multi-story townhomes on South Capitol Street south of N Street, multi-story townhomes on N Street, and retail establishments south of N Street. • Nationals Stadium, stadium entry and parking structure are on the east side of South Capitol Street.	B/E/F
CNE-7 South Capitol Street between N Street and M Street	• Land uses on the west side include paved parking lots, retail and restaurant establishments, Washington DC Superior Court offices, and multi-story townhomes (behind retail/restaurant/offices to Half Street). • Land uses on the east side include paved parking lots (between South Capitol Street and Half Street) and Public Storage.	B & E

Table 3: Land Use Activities

Location	Activity	Identified Categories
CNE-8 South Capitol Street between M Street and I Street	• Land uses on the west side include 7-Eleven and paved parking lot (north of M Street), gravel parking lot and UPS (between L Street and K Street), and Capitol Skyline Hotel. • Land uses on the east side include St. Vincent De Paul Church (northeast quadrant of South Capitol Street and M Street), business offices north side of M Street, business offices on Half Street, vacant property at the northeast quadrant of South Capitol Street and L Street (future business office), vacant property at the southeast quadrant of South Capitol Street and I Street (no future land use/permit - Category G), vacant property at the southwest quadrant of Half Street and I Street (future residential development) and vacant property on the south side of I Street (future residential development Congressional Square).	B/C/E
CNE-9 South Capitol Street between I Street and (I-395	• Land uses on the west side include Washington DC owned recreation center building and Randall Pool and Recreation Center facilities (outdoor swimming pool, basketball court, tennis courts, baseball fields, and multi-purpose field) at the northwest quadrant of South Capitol Street and I Street, Capitol Park Plaza Condominium and multi-story apartments with playground along the I-395 off ramp to South Capitol Street. • Land uses on the east side include McDonald's, industrial buildings/facilities adjacent to I-395 and Capital Yards Apartments and restaurants on I Street.	B/C/E/F
CNE-10 South Capitol Street between I-395 and Independence Avenue	• Railroad tracks and railroad facilities are located adjacent to the north side of I-395. • Land uses on the west side include Verizon office building north of I-395, Fairchild office building north of E Street and business/government offices between C Street and Independence Avenue. • The Spirit of Justice Park is located on the west and east side of South Capitol Street. • Land uses on the east side include a power plant for the US Capitol and its maintenance and office buildings between I-395 and E Street, business office buildings and auto garage at the northeast quadrant of South Capitol Street and E Street, multi-story townhomes at the southeast quadrant of South Capitol Street and D Street, and business/government offices between C Street and Independence Avenue.	B/C/F

Table 3: Land Use Activities

Location	Activity	Identified Categories
CNE-11 New Jersey Avenue between M Street and I-395	• Land uses on the west side include vacant property at the northwest quadrant of New Jersey Avenue and M Street (future residential development), multi-story apartment and business office on 1st Street, St. Matthews Baptist Church (south of L Street), Eagle Academy (preschool/daycare – north of L Street), multi-story apartment with an outdoor swimming pool (between K Street and I Street), and vacant property between I Street and I-395 (no future land use/permit – Category G). • Land uses on the east side include business office (between M Street and L Street), Marriott Courtyard Hotel and residential condominiums (between L Street and K Street), Washington Canal Park (behind Marriot Courtyard Hotel), property undergoing earthwork at the northeast quadrant of New Jersey Avenue and K Street during the field review August 2013 (future residential developments Park Chelsea and Square 739), and property undergoing earthwork at the southeast quadrant of New Jersey Avenue and I-395 during the field review August 2013 (former parking lot, no permit – Category G).	B/C/G
CNE-12 New Jersey Avenue between I-395 and Independence Avenue	• Land uses on the west side include railroad tracks and a power plant facility for the US Capitol and maintenance buildings, multi-story townhomes (between E Street and D Street), the Spirit of Justice Park (between D Street and C Street) and business/government offices (between C Street and Independence Avenue. • Land uses on the east side include Garfield Park north of I-395, a commercial establishment at the southeast quadrant of New Jersey Avenue and E Street, multi-story townhomes north of Garfield Park to D Street, paved parking lot (between D Street and C Street) and business office (between C Street and Independence Avenue.	B/C/E/F

2.3.2 Noise-Sensitive Receptors

According to DDOT Noise Policy, a noise-sensitive receptor is a location that registers measurable sound levels, typically a residence or other use that could potentially be negatively affected by traffic noise. A receptor is a discrete or representative location of a noise sensitive area, for any of the land uses listed in Table 2.

Noise-sensitive receptors to be used in the noise model are established based on land use assignments completed in Section 2.3.1 and presented in Table 3.

The DDOT Noise Policy states noise-sensitive receptors are typically limited to within 600 feet of the proposed improvements. A noise-sensitive receptor is typically located within 600 feet of the proposed improvement in areas of the project where the primary noise sources roadways are proximal (e.g., at I-295 and Suitland Parkway and at I-395 and South Capitol Street) and it is anticipated based on proximity of roadways and roadway traffic volumes that noise propagation would be significant.

However, in areas where noise-sensitive receptors consists mostly of the exterior areas of medium to high density and multi-story residential land uses (Category B) and business offices (Category E), direct line-of-sight noise propagation was mostly limited to first row land uses with receptors adjacent to the primary noise source roadways (e.g., along Suitland Parkway and South Capitol Street). At these areas, second row, third row, and other land uses beyond the typical exposure distance to highway noise were generally shielded by intervening mid-rise to high-rise buildings. Hence, noise propagation likely would be obstructed by intervening buildings and significant noise likely would not reach up to 600 feet of the proposed improvement. At these areas, noise sensitive receptors are located proximal to the primary noise source roadway and not necessarily up to 600 feet of the proposed improvements.

Based on the initial results of the noise model, areas where noise-sensitive receptors are deemed necessary for the noise study are then further expanded to account for all potentially impacted noise-sensitive receptors. At the minimum, a noise receptor was provided for each land use within the project area for activity categories B through E. Receptors were also provided for Category G properties determined to have future noise-sensitive land use (categories B, C, or E). For select Category B and E properties, upper floor receptors (for multi-story buildings with areas of frequent exterior human use such as balconies or elevated outdoor recreation areas) were added to determine if noise levels would approach or exceed the NAC at these elevated locations, specifically when the first floor noise receptor did not approach or exceed the NAC. Procedures outlined in Appendix A of the DDOT Noise Policy were followed in determining placement of noise receptors for Category C properties (parks and recreation areas) that may potentially approach or exceed the NAC. The noise-sensitive receptors included in this study are shown in plans in Appendix A.

2.4 Existing Noise Measurements and Model Validation

Representative monitoring locations were established for measurements of existing noise conditions, which were then used for validation of the noise model. The locations were distributed along primary noise source roadways and adjacent to categories B (residential) and E (business offices) uses which represent the majority of land uses found in the project area. Four noise measurement locations were identified for the project area (Figure 4).

Validation noise measurements were collected during the period covering August 5 through 7, 2013. Noise measurements were made during the mid-morning or mid-afternoon peak traffic periods, between 9:30 AM to 11:30 AM and 1:30 PM to 3:30 PM, when traffic was observed to be at free-flow in most cases. Noise measurements were taken in conformance with national standards in accordance with procedures described

in *the FHWA Highway Traffic Noise: Analysis and Abatement Guidance (June 2010 revised December 2010).*

All measurements were taken at locations adjacent to roadways where development currently exists or where development has been planned and programmed, and may be affected by traffic noise from the project due to proximity to the primary noise source roadway.

The duration of each measurement was 20 minutes to provide a statistically representative data sample. Two measurements were taken at each of the four sites. Measured noise levels were typical of traffic noise conditions near major roadways, which are characterized by higher noise levels closer to the roadways and lower noise levels farther from the roadways.

Noise measurements were collected by using a tri-pod mounted CEL 593 sound level meter and a Bruel & Kjaer 4231 acoustical calibrator, both of which are ANSI Type 1 instruments. The CEL 593 sound level meter and its microphone were calibrated in the laboratory on June 4, 2010 by Casella USA, and on October 15, 2013 by West Caldwell Calibration Laboratories, Inc. The Bruel & Kjaer 4231 acoustical calibrator was calibrated on June 14, 2012 by West Caldwell Calibration Laboratories, Inc. Laboratory calibration certificates are included in Appendix B.

Figure 4: Noise Measurement Locations

Field calibration of all noise equipment was performed before each measurement was recorded. The microphones were mounted at an approximate height of five feet above ground level, which correlates to the average position of the human ear. Traffic speeds were observed from posted speeds or the highest overall speed of vehicles in the traffic flow (approximated by pacing traffic) during the time of field measurement. Traffic volumes by vehicle classification and vehicle speeds were observed and counted during each 20-minute measurement period. All measurements were performed under acceptable climatic and street surface conditions. Field noise measurement data sheets are included in Appendix C.

Per FHWA and DDOT policy, for a noise model to be validated the difference between measured and predicted noise levels must be 3 dBA or less. Table 4 presents the field measurements and validation results, showing that the model meets the validation requirement.

Table 4: Existing Noise Measurements and Model Validation Results

Site	Site Address	Land Use	Date	Start/End Time	Measured Noise Level L_{eq} (h) (dBA)	Predicted Noise Level L_{eq} (h) (dBA)	Difference (dBA)[1]
1	2502 Stanton Street	Single-Family Residential	8/5/13	10:21 AM 10:46 AM	64	66	2
2	1345 South Capitol Street	Apartments Residential	8/5/13	1:45 PM 2:14 PM	73	71	2
3	K Street and South Capitol Street	Office	8/6/13	11:18 AM 11:47 AM	73	70	3
4	100 I Street SE	Residential/ Mixed Use	8/7/13	10:57 AM 11:21 AM	62	61	2

2.5 Predicted Noise Levels

The primary source of noise in the project area is motor vehicles traveling along Suitland Parkway SE, I-295, South Capitol Street (including the Frederick Douglass Memorial Bridge), and I-395. Other local connecting roadways such as Martin Luther King, Jr. Avenue SE, Firth Sterling Avenue SE and M Street are also significant sources of noise. Predicted noise levels for the Revised Preferred Alternative were calculated using the FHWA's Traffic Noise Model® (TNM), Version 2.5, released in 2004, and compared to the No-Build Alternative and to the existing condition. The noise model results are also compared to the previous noise study results from the FEIS and presented in Section 6.0.

[1] Values are rounded to the nearest whole decibel.

2.5.1 Noise Model Development and Traffic Volumes

Noise Model Development

DDOT Noise Policy states that construction of an adequate noise model requires three-dimensional coordinates for the existing condition and proposed alternatives. The existing, No-Build Alternative, and Revised Preferred Alternative noise model elements (noise receptors, roadways, ground zones, and intervening buildings represented by fixed-height noise barriers) were developed by Parsons Brinckerhoff in MicroStation® using field review information, GIS, and available recent aerial photography (in digital state-plane coordinates). MicroStation® files of topographic maps, existing and build condition contour elevations, and proposed improvement engineering design (includes roadway improvements only) for segments 1 through 5 were provided by CH2MHill. All noise model elements were digitized in TNM® 2.5 based on MicroStation® output of three dimensional coordinates (northing and easting coordinates and ground elevation). TNM® 2.5 noise model inputs are included in Appendix C.

The noise study area was defined to encompass noise-sensitive receptors (for all noise activity categories identified in Table 2 with exception of Category F) adjacent to the primary noise source roadways within the project area, including both impacted noise receptors and as well as noise receptors beyond the threshold of the NAC (non-impacted noise receptors).

Existing, 2040 No-Build, and 2040 Build Traffic Volumes

DDOT Noise Policy states that prediction of future noise levels relies on the certified/project traffic volumes for the peak noise hour in the design year, because the peak noise hour is often the peak truck hour. The FHWA *Highway Traffic Noise: Analysis and Abatement Guidance* indicates highway traffic noise also depends on the speed of traffic. The AM and PM peak hour volumes are available from the Draft South Capitol Street Interchange Modification Report (DDOT, October 2013). However, the peak traffic hour is not necessarily the peak noise hour specially when the peak traffic hour shows modeled traffic speeds that are lower than posted speeds, and does not necessarily predict the peak truck hour. Field observations determined that South Capitol Street and Suitland Parkway traffic tend to be at free flow or moves at the posted speed limits between 9:30 am and 10:30 am, and between 2:30 pm and 3:30 pm at daytime operating hours.

Two off-peak hours were selected for noise modeling based on field observation. The loudest-hour noise levels in the study area would be determined by comparing noise model results, specifically for receptors adjacent to primary noise source roadways. Off-peak hour volumes conditions:

- Mid-morning off-peak hour volume when traffic is still moving at LOS C/D conditions. This was defined as the hour between 9:30 am -10:30 am.
- Mid-afternoon off-peak hour volume when traffic is still moving at LOS C/D conditions. This was defined as the hour between 2:30 pm to 3:30pm.

The methodology of estimating these two off-peak hour traffic volumes involved four steps:

1. Developing Average Daily Traffic (ADT) volumes for the project area roadways from the MWCOG travel demand model outputs for 2010, 2040 No-Build and 2040 Build scenarios.
2. Applying appropriate "k" factors to project area roadways to estimate mid-morning and mid-afternoon off-peak hour volumes. These "k" factors were selected based on automatic traffic recorder (ATR) data from St. Elizabeths Study (2009), M Street SE/SW Transportation Study (2012), and M Street Special Events Study (2013).
3. Applying medium and heavy truck percentages based on data from the South Capitol Street FEIS (2011).
4. Estimating the number of buses (e.g., WMATA, regional commuter, DC Circulator, school, and tourist buses) in the area based on traffic counts and current and future transit services in the study area.

The resulting mid-morning and mid-afternoon peak traffic volumes were evaluated in TNM® 2.5 and results were compared to determine the traffic volume which yields the loudest hourly results. Based on the model results, it was determined that use of the mid-afternoon off-peak traffic volumes generally predicted higher noise levels for receptors adjacent to primary noise source roadways. Thus, the mid-afternoon traffic volumes were used for noise analysis of the existing, No-Build, and Revised Preferred Alternative scenarios.

Traffic volumes were entered into the noise model for Suitland Parkway SE, I-295, South Capitol Street (including the Frederick Douglass Memorial Bridge) and local connecting roadways within the project limits. The noise model requires input of hourly traffic volumes and speeds by vehicle type (automobiles, medium trucks, heavy trucks, buses, and motorcycles) for each of the 2010, 2040 No-Build and 2040 Build scenarios. Traffic speeds were based on posted speeds or the highest overall speed of vehicles in the traffic flow (approximated by pacing traffic). The existing condition, 2040 No-Build, and 2040 Build condition traffic volumes are included in Appendix D.

2.5.2 Noise Model Results

The predicted noise levels for the existing, No-Build, and Revised Preferred Alternative conditions were determined from TNM® 2.5. Table 5 summarizes the noise level impact predictions for the Existing, No-Build, and Revised Preferred Alternative scenarios. The full table of predicted noise levels is presented in Appendix E.

Table 5: Summary of Predicted Location Noise Impacts

Project Area	2013 Existing	2040 No-Build	2040 Revised Preferred Alternative
CNE-1	0	0	0
CNE-2	5	5	5
CNE-3	2	1	0
CNE-4	29	26	28
CNE-5	1	1	0
CNE-6	8	8	12
CNE-7	3	5	10
CNE-8	2	2	2
CNE-9	3	4	4
CNE-10	0	0	0
CNE-11	0	0	0
CNE-12	0	1	1

Differences in predicted noise levels between the Revised Preferred Alternative and the No-Build Alternative or existing conditions are also shown in Appendix E. The results showed slight increases in predicted noise levels between the existing condition and the 2040 design year. Front row (adjacent to primary noise source roadways and typically unshielded) noise-sensitive receptors have predicted design year increases over existing condition of up to 3 dBA for receptors adjacent to Suitland Parkway, less than 1 dBA for receptors adjacent to I-295, up to 5 dBA for receptors adjacent to South Capitol Street, and up to 3 dBA for receptors adjacent to South Capitol Street/I-395. These increases can generally be explained by increased traffic volumes and changes to the roadway geometry that shift traffic closer to a noise-sensitive receptor location.

Predicted noise levels presented in Appendix E indicate several noise receptors with noise levels predicted to decrease in the design year (i.e., a negative value in the *Difference Preferred vs. Existing* column). In general, these noise reductions are anticipated in the future because of the fact that traffic volumes (from primary noise source roadways) are expected to reduce from local roadways due to improvements of the I-295 and I-395 interchanges within the project area. The Revised Preferred Alternative allows more vehicular throughput during peak hours along I-295 and I-395 corridors as well as the South Capitol Street corridor. However, the growth of auto traffic demand in the project area freeways and arterials from existing to future conditions is modest, and often negative, because more trips are projected to shift from auto to the transit modes such as buses, metro and street car[2].

The location-specific traffic trends that are contributing to the changes in the noise levels are discussed below:

[2] Draft South Capitol Street Interchange Modification Report, DDOT, October 2013

- **CNE-1:** This segment of Suitland Parkway is projected to have lower traffic volumes in the design year compared to the existing condition. In contrast, future traffic volumes on Martin Luther King Jr. Avenue SE, south of Sumner Road, is projected to increase significantly in the design year. Consequently, the noise-sensitive receptors located on the west side of Suitland Parkway and adjacent to Martin Luther King Jr. Avenue SE are projected to have slightly higher noise levels than existing condition as the traffic increase along Martin Luther King Jr. Avenue SE was partially offset by a traffic decrease along Suitland Parkway.
- **CNE-2:** Several noise-sensitive receptors are located on the south side of Sumner Road and their nearest primary noise source is the northbound lanes of I-295 (and not Suitland Parkway). I-295 northbound lanes are projected to have slightly lower traffic volumes in design year than existing condition.
- **CNE-3:** Due to distance of receptors from adjacent roadways, the primary noise source is Howard Road SE (not Suitland Parkway or I-295). Howard Road SE westbound lanes between I-295 and South Capitol Street have significantly higher traffic volumes in existing condition compared to design year.
- **CNE-4:** This segment of I-295 is projected to have slightly lower traffic volumes in design year than existing condition, which resulted in the drop of noise level.
- **CNE-5:** The proposed Frederick Douglass Bridge would be located south of the existing bridge. Hence, traffic is shifted away from noise-sensitive receptors at Anacostia Park resulting in reduced noise levels in the existing condition compared to the design year.

2.6 Potential Impacts

According to the DDOT Noise Policy, a highway traffic noise impact is deemed to occur when predicted design year noise levels approach or exceed the NAC (listed in Table 2), or are a substantially increase over existing noise levels. Table 5 summarizes the predicted impacts for noise-sensitive receptors throughout the project area. Predicted design year noise impacts are also shown in red and bold in the TNM® 2.5 Predicted Noise Levels in Appendix E for the *2040 Revised Preferred Alternative* (design year) column. Predicted noise levels in Appendix E also presents results of the design year increase over existing noise levels in the *Difference Preferred vs. Existing* column, and shows that a substantial noise increase (10 dBA or more) is not predicted for any noise-sensitive receptor.

3.0 Traffic Noise Abatement

3.1 Evaluation of Abatement Measures

The FHWA and DDOT require that noise abatement measures be considered at all locations where traffic-related noise impacts are identified. As indicated in Table 2, the need to consider abatement is based on the potential for impacts at exterior areas where human activity may occur (i.e., abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit). In accordance with

FHWA and DDOT requirements, abatement measures were evaluated in terms of their effectiveness to substantially reduce predicted design year noise levels at locations where noise levels exceeded the FHWA and DDOT noise abatement criteria. The following list details all possible noise abatement measures. However, noise barriers are typically the most practical and effective noise abatement measure, and are thus the only measure evaluated in detail.

- **Constructing noise barriers within the proposed right-of-way:** as indicated in the DDOT Noise Policy, construction of noise barriers within the proposed right-of-way is usually the most practical and effective measure; however, the District of Columbia is a dense urban area with existing roadways with narrow right-of-way and historic character with view sheds of national importance (which should be considered when evaluating the implementation of noise barriers).
- **Modifying the proposed horizontal and/or vertical alignment of the roadway:** alteration of horizontal and vertical alignments along South Capitol Street would be constrained by the existing terrain, underlying geology, and surrounding land uses.
- **Acquiring property to serve as a buffer zone:** in general, acquisition of property can reduce noise impacts where unimproved property exists between prediction locations and the proposed alignment.
- **Modifying speed limits and/or restricting truck traffic:** enforcing lower speed limits and limiting roadway use to automobiles only may not be practical on Suitland Parkway, I-295, or South Capitol Street because these roadways are major routes for the movement of a mix of vehicles, including heavy trucks.
- **Providing noise insulation:** noise insulation would likely be implemented on properties that are far from the roadway right-of-way and have no exterior use areas, and would be at the discretion of the property owner.

Non-barrier noise abatement measures such as roadway alignment modifications, buffer zones, traffic and speed modifications, and noise insulations were considered for impacted noise receptors. However, non-barrier abatement measures were determined not viable due to the following reasons:

- **Roadway alignment modification:** Horizontal and vertical roadway alignments were set during the FEIS. As shown in Table 5 of Section 2.5.2, the number of impacted noise receptors between the 2040 No-Build and the 2040 Revised Preferred Alternative are almost similar for most CNEs. This shows that the horizontal and vertical roadway alignments were located at a sufficient distance from noise sensitive receptors that minimizes impacts. To further reduce noise impacts with adjustment to the vertical roadway alignment, the noise line-of-sight between the noise source (roadway traffic) and noise receptor would need to be broken. This is done by significantly lowering the roadway below existing grade to create a cut section, which could act similarly as an earth berm that absorbs noise (depending on the relative location of noise receptors). At this point in the

planning and design phase, adjustments to the horizontal and vertical roadway alignments may not be a viable.

- **Traffic speed modifications:** Traffic speed modifications are already proposed on South Capitol Street in form of at-grade circles on intersections north and south of Anacostia River. The proposed speed limits in these areas would be much lower than the typical speed on South Capitol Street, and would result in generally lower traffic noise. This has been included in future build noise models. Prohibition of heavy trucks (which is a significant source of noise) along South Capitol Street is not practical because the roadway is a major route for the movement of a mix of vehicles, including heavy trucks.

- **Noise insulation:** Noise insulation would likely be implemented on properties that are not in the roadway right-of-way and would be at the discretion of the property owner. Since no traffic noise impacts are predicted to occur for interior noise-sensitive areas (NAC Activity Category D), interior noise insulation was not considered as a potential noise impact mitigation measure. It should be noted that St. Vincent De Paul located in CNE-8 was considered a NAC Activity Category D receptor. Per FHWA guidance, a 25 dB interior/exterior noise reduction factor was used to estimate the interior noise levels based on the predicted outdoor noise level. The resulting interior noise level is below NAC Activity Category D threshold; there is no interior noise impact.

The evaluation of traffic noise impacts and appropriate noise abatement measures are summarized below for each project sub-area (a map of the noise-sensitive receptors is included in Appendix A):

- **CNE-1:** Noise-sensitive receptors in this area are not predicted to approach or exceed the NAC for identified activity category land uses.

- **CNE-2:** Noise abatement measures were considered for impacted Category C (recreational land use) noise-sensitive receptors 1758, 1759, 1760, 1762, and 1764. Noise barrier evaluations followed the procedures provided in Appendix A of the DDOT Noise Policy. Construction of a noise barrier within the existing and proposed Suitland Parkway right-of-way is further evaluated and discussed in detail in Section 3.2.

- **CNE-3:** Noise-sensitive receptor 1859 is currently a parking structure (owned by the Anacostia Metro Station). This site is also a known future residential development (proposed Poplar Point development with a residential component – information obtained from the Office of the Deputy mayor for Planning and Economic Development website); however, engineering plans and building permits are not available (no documentations obtained from developers and no records with local planning agencies). Since there was no concrete information obtained regarding the actual proposed land use as a residential property, this receptor was included in this study for the current land use as Category F

(parking structure). Receptor 1859 would not approach or exceed the NAC of 71 dBA.

- **CNE-4:** Noise abatement measures were considered for impacted Category B noise-sensitive receptors 1860 through 1865, 1874 through 1880 1885 through 1898, 1903 and 1904. Construction of a noise barrier within the existing I-295 right-of-way is further evaluated and discussed in detail in Section 3.2.
- **CNE-5:** Noise-sensitive receptors in this area are not predicted to approach or exceed the NAC for identified activity category land uses.
- **CNE-6:** Noise abatement measures were considered for impacted receptors on the west side of South Capitol Street. Typically 1st row receptors were impacted while back row receptors were shielded by intervening buildings. Impacts included categories B and E noise-sensitive receptors for the following land uses: townhomes with front doors facing South Capitol Street (where frequent exterior human use was observed), Camden South Capitol Apartments (with 2nd story and higher level balconies facing South Capitol Street), and retail establishments (with entrances facing South Capitol Street). To be minimally effective, a continuous noise barrier would need to extend from north of N Street to south of P Street. Such a noise barrier would restrict a pedestrian's ability to cross South Capitol Street anywhere along its length and restrict vehicular access from South Capitol Street to N Street, O Street, P Street, and a parking lot. As a result, the placement of a noise barrier at this location was determined not to be feasible.
- **CNE-7:** noise abatement measures were considered for impacted categories B and E noise-sensitive receptors for the following land uses: townhomes with front doors facing South Capitol Street or M Street and a retail establishment with its entrance facing South Capitol Street. The townhomes are behind business and retail buildings adjacent to South Capitol Street. However, some are directly exposed to noise from M Street or South Capitol Street and are impacted when there are no intervening buildings on the property adjacent to these roadways. The appropriate mitigation is a noise barrier located adjacent to impacted noise receptors, within the M Street and South Capitol Street existing rights-of-way. Such a barrier would restrict pedestrian and vehicular access (through an alley) from the townhomes to M Street. It would also restrict pedestrian access to business/retail establishments to South Capitol Street. As a result, the placement of a noise barrier at this location was determined not to be feasible.
- **CNE-8:** noise abatement measures were considered for impacted Category C noise-sensitive receptors 1400 and 1401 (i.e., St. Vincent De Paul entrance on South Capitol Street and outdoor seating on M Street.) To be effective, a continuous noise barrier would need to be constructed around the church property. The placement of a noise barrier was determined not to be feasible because it would restrict pedestrian access to the cross walks at the north-east corner of South Capitol Street and M Street. Receptor 1400 could potentially also be considered a Category D receptor with interior noise-sensitive use. The church structure is masonry and has no operable windows, so per FHWA guidance a 25 dB interior/exterior noise reduction factor would be used to

estimate the interior noise levels based on the predicted outdoor noise level. The resulting interior noise level would be 45 dBA (70 – 25), which is below the 51 dBA Category D NAC. As a result, there is no interior noise impact at Receptor 1400 which to consider for mitigation.

- **CNE-9:** Noise abatement measures were considered for impacted Category C (recreational land use) noise-sensitive receptors 1171 and 1172 (i.e., Randall Pool and Recreation Center tennis courts and baseball field spectator seating). Noise barrier evaluations followed procedures provided in Appendix A of the DDOT Noise Policy. Construction of a noise barrier within the existing I-395 and South Capitol Street right-of-way is further evaluated and discussed in detail in Section 3.2.
- **CNE-10:** Noise-sensitive receptors in this area are not predicted to approach or exceed the NAC for identified activity category land uses.
- **CNE-11:** Noise-sensitive receptors in this area are not predicted to approach or exceed the NAC for identified activity category land uses.
- **CNE-12:** Noise abatement measures were considered for impacted Category B receptor 1140, which is a townhome near the intersection of E Street and New Jersey Avenue. This receptor is impacted due to its close proximity to North Carolina Avenue SE. To be minimally effective, a continuous noise barrier would need to start at the northeast corner of the New Jersey and North Carolina Avenue intersection and extend northeast around the corner of First Street and North Carolina Avenue. Such a barrier would restrict a pedestrian's ability to cross First Street SE. As a result, the placement of a noise barrier at this location was determined not to be feasible.

3.2 Noise Barriers

For a noise barrier to be incorporated into a project, the barrier must be determined to be both feasible and reasonable. DDOT has defined criteria for assessing the feasibility and reasonableness of constructing noise barriers. For a noise abatement measure to be considered feasible, all of the following must be true:

1. Achieve at least a 5 dBA noise reduction at impacted receptors. DDOT requires that 50 percent or more of the impacted receptors experience 5 dBA or more of insertion loss to be feasible.
2. Determination that it is possible to design and construct the noise abatement measure. An initial determination can be done during the planning stage with use of existing engineering conditions and proposed engineering design improvement. Final determination is conducted the final design noise analysis when engineering design factors are available.
3. Placement of a noise barrier will not restrict pedestrian or vehicular access.
4. Construction of a noise barrier will not cause safety or maintenance problems.

For a noise abatement measure to be considered reasonable, all of the following must be true:

1. A majority of all benefited receptors express a desire for the proposed noise abatement measure. This is determined during a final survey when the viewpoints of benefited receptors are solicited after the approved final design noise analysis (i.e., post NEPA process).
2. A noise barrier would cost no more than $40,000 per benefited receptor. A benefited residence is defined as a dwelling unit that receives at least 5 dBA noise reductions. The estimated cost of construction (i.e., material and labor) would be $25 per square foot.
3. At least one benefited receptor must receive a 7 dBA or greater noise reduction from the barrier.

3.2.1 Noise Barrier Evaluations

DDOT Noise Policy states the intent of the Final Noise Report (for the SDEIS) after identifying noise impact is to document the development of appropriate mitigation measures (noise barriers) that are both feasible and reasonable. Noise barriers were evaluated in TNM® 2.5 within the existing or proposed right-of-way of the primary noise source roadway (or on existing/proposed structure), and at noise wall heights of 10 to 22 feet (at 2 feet intervals). It is generally acceptable practice to evaluate noise barrier beginning at a height of 10 feet, which breaks the noise line-of-sight of trucks with noise-emitting exhaust stacks at about 10 feet from the ground. Most highway agencies have the capacity to build and have noise barrier and foundation design specifications for noise wall heights up to 22 feet. Noise wall height intervals at 2 feet were selected because of the generally flat topography and grade separation between roadways and adjacent noise receptors. Noise wall height interval at 1 foot is typically used for areas with significant grade separation between roadways and noise receptors. The resultant feasible and reasonable barriers are presented for project areas with noise receptors that approach or exceed the NAC.

CNE-2: Suitland Parkway between Martin Luther King Jr. Avenue SE and I-295

A single-continuous 1,223-foot long noise barrier was modeled adjacent to impacted Category C noise receptors on the west side of Suitland Parkway. The wall was cited 10 feet behind the existing Suitland Parkway edge of pavement and proposed Suitland Parkway southbound off-ramp (to Martin Luther King Jr. Avenue SE) edge of pavement. Procedures for determining the feasibility and reasonableness for Activity Category C (recreation areas), presented in Appendix A of the DDOT Noise Policy, were followed to determine the number and spacing of additional noise receptors needed so that park lands and other outdoor activities within Category C can be treated in a similar manner as Category B residential areas. Thirty-one additional noise receptors, appropriately spaced according to guidelines set forth in Appendix A of the DDOT Noise Policy, were included in the noise model barrier evaluation.

The results of the noise barrier evaluation are as follows:

- At heights of 12, 14, 18, and 20 feet, the noise barrier would provide at least the minimum insertion loss of 5 dBA for 10 to 16 benefited receptors (including all seven impacted noise receptors).
- The noise barrier total costs range from $366,900 to $611,500, depending on height and for a fixed length of 1,223 feet. The noise barrier at these heights would cost no more than $40,000 per benefited receptor.
- The benefited receptors would have calculated noise reductions ranging from 6 dBA to 11 dBA depending on noise barrier height. The design noise reduction of at least 7 dBA was met for at least one benefited receptor for each noise barrier height.
- A 1,223-foot long noise barrier at heights of 12, 14, 18, and 20 feet are considered feasible and reasonable, pending DDOT solicitation of benefited receptor viewpoints regarding the noise wall desirability.

The proposed noise barrier and representative Category C receptors are shown in Appendix F. Details of the noise barrier evaluation are shown in Appendix G.

CNE-4: I-295 between south of Defense Boulevard and 11th Street Bridge Exit

A single-continuous 1,603-foot long noise barrier was modeled adjacent to impacted Category B and C (i.e., church) noise receptors on the south side of I-295, 2.5 feet behind the existing and proposed I-295 roadway barrier. The results of the noise barrier evaluation are as follows:

- At two-foot contours of 10 to 22 feet, the noise barrier would provide at least the minimum insertion loss of 5 dBA for 39 to 45 benefited receptors (including all 28 impacted noise receptors).
- The noise barrier total costs range from $400,750 to $881,650, depending on height and for a fixed length of 1,603 feet. The noise barrier at these heights would cost no more than $40,000 per benefited receptor.
- The benefited receptors would have calculated noise reductions from 5 dBA to 12 dBA depending on noise barrier height. The design noise reduction of at least 7 dBA was met for at least one benefited receptor for each noise barrier height.
- A 1,603-foot long noise barrier at heights from 10 to 22 feet is considered feasible and reasonable, pending DDOT solicitation of benefited receptor viewpoints regarding the noise wall desirability.

The proposed noise barrier and Category B and C receptors are shown in Appendix F. Details of the noise barrier evaluation are shown in Appendix G.

CNE-9: I-395 Eastbound Ramp at South Capitol Street

A single-continuous 947-foot long noise barrier was modeled, adjacent to impacted Category C noise receptors, on the I-395 eastbound off ramp (to South Capitol Street) structure and on the west side of South Capitol Street, varying from a minimum of 10

feet behind the existing South Capitol Street edge of pavement. Procedures for determining the feasibility and reasonableness for Activity Category C (i.e., recreation areas), presented in Appendix D of the DDOT Noise Policy, were followed to determine the number and spacing of additional noise receptors needed so that park lands and other outdoor activities within Category C can be treated in a similar manner as Category B residential areas. Twenty-three additional noise receptors, appropriately spaced according to guidelines set forth in Appendix A of the DDOT Noise Policy, were included in the noise model barrier evaluation. The results of the noise barrier evaluation are as follows:

- At heights of 10, 12, 14, and 22 feet, the noise barrier would provide at least the minimum insertion loss of 5 dBA for 8 to 15 benefited receptors, which includes 86 percent (6 of 7) of the impacted receptors. At 22 feet height, the barrier would also provide at least 5 dBA noise reduction for the remaining impacted noise receptor.
- The noise barrier total costs range from $236,750 to $520,850, depending on height and for a fixed length of 947 feet. The noise barrier at these heights would cost no more than $40,000 per benefited receptor. Only the noise barrier height at 22 feet would provide at least the minimum noise reduction for all seven impacted noise receptors, and cost no more than $40,000 per benefited receptor.
- The benefited receptors would have calculated noise reductions from 5 dBA to 15 dBA depending on noise barrier height. The design noise reduction of at least 7 dBA was met for at least one benefited receptor for each noise barrier height.
- A 947-foot long noise barrier at heights of 10, 12, 14, and 22 feet are considered feasible and reasonable, pending DDOT solicitation of benefited receptor viewpoints regarding the noise wall desirability. The proposed noise barrier and representative Category C receptors are shown in Appendix F. Details of the noise barrier evaluation are shown in Appendix G.

DDOT Noise Policy states the final component of a highway traffic noise analysis is conducted in project design (i.e., post SDEIS and Record of Decision), where the analysis is updated, as necessary, and the noise barrier is designed and included in the construction plans. It is likely that the recommended noise barrier length and height would be selected during project design and included in final construction plans.

4.0 Project Related Construction Noise Impacts

Construction activities within the project area would cause short-term noise effects on noise-sensitive receptors in the immediate vicinity of the construction site. Effects on community noise levels during construction would result from noise from construction equipment operation and movement of construction and delivery vehicles. The level of effect would depend on the noise emission levels of the equipment and activities involved, the duration of the activity, construction schedule and work hours, and the distance from noise sensitive properties.

Resulting noise levels at a given location would depend on the type and number of pieces of construction equipment operating and the distance from the construction site.

Noise levels from construction activities can vary, depending on the phase of construction, which include land clearing and excavation, building of new roadways, and building of retaining walls. At a typical site, noise levels would be highest during the early phases of construction, when excavation and heavy daily truck traffic would occur.

Noise from pile driving associated with the construction of any proposed new ramps is expected to create annoyance to nearby properties. It is anticipated that pile driving would be limited to daytime hours and would last for a short duration. There are several nearby residential areas, which may also experience annoyance. When feasible, quieter methods, such as vibratory driving or pre-augering prior to driving piles should be used. These methods would be recommended where geological conditions permit their use. Identification and specification of noise abatement measures will be developed during final design of the project.

Typical noise levels from construction equipment, which may be employed during the construction period, are presented in Table 6. Typical equipment noise emission limits, which may be incorporated into a project specification, are also provided in the table. This information comes from the FHWA Construction Noise Handbook (2006), which along with the FHWA Roadway Construction Noise Model (RCNM), can be used to estimate potential construction noise impacts at nearby receptor locations. Further information on both the RCNM model and Construction Noise Handbook can be found at:

http://www.fhwa.dot.gov/environment/noise/construction_noise/

Construction noise is regulated by the District of Columbia Municipal Regulations (DCMR) local ordinances, which are described and outlined in 20 DCMR, Chapter 31. The DCMR requirements mandate that certain classifications of construction equipment and motor vehicles meet specified noise emission standards; that except under very special circumstances require construction activities to be limited to weekdays between the hours of 7:00 AM and 7:00 PM and that construction material be handled and transported in a manner to not create unnecessary noise. A description and full scope of these requirements are described in 20 DCMR.

Table 6: Typical Roadway Construction Equipment Noise Levels and Emission Limits (dBA)

Equipment Description	Impact Device?	Acoustical Usage Factor (%)	Noise Limit L_{max} @ 50 feet (dBA, slow)	Measured Emission Level L_{max} @ 50 feet (dBA, slow)
All Other Equipment > 5 HP	No	50	85	N/A
Auger Drill Rig	No	20	85	84
Backhoe	No	40	80	78
Bar Bender	No	20	80	N/A
Blasting	Yes	N/A	94	N/A
Boring Jack Power Unit	No	50	80	83
Chain Saw	No	20	85	84
Clam Shovel (dropping)	Yes	20	93	87
Compactor (ground)	No	20	80	83
Compressor (air)	No	40	80	78
Concrete Batch Plant	No	15	83	N/A
Concrete Mixer Truck	No	40	85	79
Concrete Pump Truck	No	20	82	81
Concrete Saw	No	20	90	90
Crane	No	16	85	81
Dozer	No	40	85	82
Drill Rig Truck	No	20	84	79
Drum Mixer	No	50	80	80
Dump Truck	No	40	84	76
Excavator	No	40	85	81
Flat Bed Truck	No	40	84	74
Front End Loader	No	40	80	79
Generator	No	50	82	81
Generator (<25KVA, VMS Signs)	No	50	70	73
Gradall	No	40	85	83
Grader	No	40	85	N/A
Grapple (on backhoe)	No	40	85	87
Horizontal Boring Hydraulic Jack	No	25	80	82
Hydra Break Ram	Yes	10	90	N/A

Table 6: Typical Roadway Construction Equipment Noise Levels and Emission Limits (dBA)

Equipment Description	Impact Device?	Acoustical Usage Factor (%)	Noise Limit L_{max} @ 50 feet (dBA, slow)	Measured Emission Level L_{max} @ 50 feet (dBA, slow)
Impact Pile Driver	Yes	20	95	101
Jackhammer	Yes	20	85	89
Man Lift	No	20	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90
Pavement Scarifier	No	20	85	90
Paver	No	50	85	77
Pickup Truck	No	40	55	75
Pneumatic Tools	No	50	85	85
Pumps	No	50	77	81
Refrigerator Unit	No	100	82	73
Rivit Buster/Chipping Gun	Yes	20	85	79
Rock Drill	No	20	85	81
Roller	No	20	85	80
Sand Blasting (single nozzle)	No	20	85	96
Scraper	No	40	85	84
Sheers (on backhoe)	No	40	85	96
Slurry Plant	No	100	78	78
Slurry Trenching Machine	No	50	82	80
Soil Mix Drill Rig	No	50	80	N/A
Tractor	No	40	84	N/A
Vacuum Excavator (Vac-Truck)	No	40	85	85
Vacuum Street Sweeper	No	10	80	82
Ventilation Fan	No	100	85	79
Vibrating Hopper	No	50	85	87
Vibratory Concrete Mixer	No	20	80	80
Vibratory Pile Driver	No	20	95	101
Warning Horn	No	5	85	83
Welder/Torch	No	40	73	74

Source: FHWA Construction Noise Handbook (2006)

4.1 Construction Noise Abatement Measures

To abate or minimize expected construction noise impacts, mitigation measures should be noted directly in contract plans and specifications subject to the provisions as described in 20 DCMR, Chapter 31. Project-specific construction noise abatement that can be utilized to minimize noise impact in areas outside the construction site boundary, include the following:

- Identify land uses and activities that may be affected during construction of the project.
- Determine the measures, which are needed to minimize or eliminate adverse construction-noise effects on the community.
- When feasible, incorporate abatement measures in the project plans and specifications.
- Keep the public informed when work would take place.
- Keep a telephone log of complaints.
- Limit the number and duration of idling equipment on site.
- Provide mufflers or silencers for construction equipment operated by internal combustion engines, and maintain construction equipment in good repair.
- Where possible, reduce noise from stationary site equipment and facilities by utilizing a suitable enclosure.
- When possible, minimize use of back-up alarms during nighttime work hours.
- When possible, schedule truck loading, unloading, and handling operations to minimize on-site construction noise.

5.0 Public Involvement

The FHWA highway traffic noise regulations require DDOT to consider the viewpoints of benefited receptors in determining the reasonableness of noise abatement. The DDOT presented information about the alternatives under consideration and environmental impacts (including noise) in public meetings and hearings during the DEIS and the FEIS. The DEIS public hearings were held on March 4 and 5, 2008. Community members and organizations provided oral and written comments concerning the DEIS. Community member comments on noise included concerns about construction noise impacts, general neighborhood noise, and noise abatement alternatives. The FEIS public meetings were held on April 26 and 28, 2011. There were no documented community member comments on noise. The community members' comments regarding noise were addressed during the FEIS.

The DDOT also met on March 26, 2008 with representatives of the US Navy at the US Naval Support Facility Anacostia to discuss the Navy's comments on the DEIS, including potential noise impacts to the Child Development Center (as one of the key issues). The US Department of the Navy commented on noise mitigation after review of the DEIS. US

Navy concerns regarding the Child Development Center were addressed during the FEIS.

The next step is to solicit the viewpoints of property owners and residents of benefited noise receptors and obtain enough responses to determine their decision for or against noise abatement. DDOT Noise Policy states this is completed during a final survey when the viewpoints of benefited receptors are solicited after the approved final design noise analysis (which occurs post-SDEIS and Record of Decision).

6.0 Conclusion

6.1 Comparison of the SDEIS and FEIS Noise Studies

The result of the noise analysis for the SDEIS was compared with results from the FEIS (Noise Technical Report, September 2007). Thirteen (13) noise-sensitive receptors were included in the noise study for the FEIS for activity category land uses based on the June 1995 FHWA *Highway Traffic Noise Analysis Abatement Policy and Guidance* and the May 1997 DDOT Noise Policy Guidelines.

Four hundred fifteen (415) noise-sensitive receptors are included in the noise study for the SDEIS for activity category land uses based on the July 2011 *Procedures for Abatement of Highway Traffic Noise and Construction Noise* and the April 2011 DDOT Noise Policy. The noise study for the FEIS selected noise receptor locations that cover the general project limits, despite having fewer receptors to represent land uses.

Hence, a general comparison that identifies predicted noise levels and predicted noise impacts (between Build Alternative 2 of the FEIS and the Revised Preferred Alternative for the SDEIS) is feasible for noise receptors at similar locations within the noise study project areas previously listed in Section 2.3.1. The comparison is presented in Table 7.

Table 7: Comparison of the SDEIS and FEIS Noise Study Results

Noise Study Project Area	Predicted Noise Levels in FEIS/ Receptor Number (dBA)[3]	Predicted Noise Levels in SDEIS/ Receptor Number (dBA)	Land Use	Noise Receptor Impacts? (Yes/No)	Proposed Noise Abatement Measure
CNE-1: Suitland Parkway between west of Stanton Road SE and Martin Luther King Jr. Avenue SE	73 (R-10)	63 (1774)	Church	Yes for FEIS, No for SDEIS	None

[3] Predicted exterior noise levels were obtained for receptors R-2 to R-12 from Table C of the Noise Technical Report for Build Alternative 2, which used peak AM traffic volumes in TNM® 2.5; and from Table D for receptor R-1, which used peak PM traffic volumes. These results represent the loudest noise.

Table 7: Comparison of the SDEIS and FEIS Noise Study Results

Noise Study Project Area	Predicted Noise Levels in FEIS/ Receptor Number (dBA)[3]	Predicted Noise Levels in SDEIS/ Receptor Number (dBA)	Land Use	Noise Receptor Impacts? (Yes/No)	Proposed Noise Abatement Measure
CNE-2: Suitland Parkway between Martin Luther King Jr. Avenue SE and I-295	No receptor	69 (1762)	Recreation	Yes for SDEIS	Noise barrier
CNE-3: Suitland Parkway between I-295 and South Capitol Street	65 (R-7)	61 (1850)	School	No	None
CNE-4: I-295 between south of Defense Boulevard and 11th Street Bridge exit	63 (R-9) 65 (R-8)	62 (1705) 68 (1904)	Residential	No for FEIS, Yes for SDEIS	Noise barrier
CNE-5: South Capitol Street between south of Defense Boulevard and Potomac Avenue	59 (R-11) 59 (R-13)	58 (1672) 57 (1669)	Child Develop. Center/park	No	None
CNE-6: South Capitol Street between Potomac Avenue and N Street	72 (R-5) 61 (R-6)	69 (1484) 56 (1663)	Residential	Yes	None
CNE-7: South Capitol Street between N Street and M Street	71 (R-3)	69 (1412)	Residential	Yes	None
CNE-8: South Capitol Street between M Street and I Street	72 (R-2) 71 (R-4)	70 (1185) 70 (1400)	School/ church	Yes	None
CNE-9: South Capitol Street between I Street and I-395	No receptor	68 (1171)	Recreation	Yes for SDEIS	Noise barrier
CNE-10: South Capitol Street between I-395 and Independence Avenue	No receptor	62 (1111)	Residential	No for SDEIS	None
CNE-11: New Jersey Avenue between M Street and I-395	No receptor	60 (1195)	Residential	No for SDEIS	None
CNE-12: New Jersey Avenue between I-395 and Independence Avenue	66 (R-1) 72 (R-12)	66 (1140) 61 (1155)	Residential/ park	Yes for FEIS, Yes for SDEIS	None

6.2 Noise Abatement Statement of Likelihood

Noise-sensitive noise receptors with design year noise levels that approach or exceed the NAC for Activity Category B and C (i.e., church and recreation areas) based on the Revised Preferred Alternative were evaluated for appropriate noise abatement measures and traffic noise mitigation feasibility and reasonableness. Noise abatement measures were evaluated for all impacted noise-sensitive receptors. Noise barriers were determined to be the only preliminarily feasible and reasonable noise abatement measure for this project.

Three noise barriers were determined to be preliminarily feasible and reasonable and are likely to be incorporated in the project (the recommended noise barrier length and height will be selected during project design):

- A 1,223-foot long noise barrier at heights of 12, 14, 18, and 20 feet on the west side of Suitland Parkway between Martin Luther King Jr. Avenue SE and I-295;
- A 1,603-foot long noise barrier at heights from 10 to 22 feet on the south side of I-295 between south of Defense Boulevard and 11th Street Bridge exit; and
- A 947-foot long noise barrier at heights of 10, 12, 14, and 22 feet on the west side of South Capitol Street between I Street and I-395.

The three preliminarily feasible and reasonable noise barriers are likely to be constructed upon final determination that it is possible to construct the noise barriers and viewpoints of all benefited receptors are determined during a final survey of residents and property owners after the approved final design noise analysis. The final design noise analysis and coordination with property owners and residents will be conducted during project design after the approval of the SDEIS and the Record of Decision (ROD).

Noise impacts for which no noise abatement measures are feasible and reasonable are:

- **CNE-6:** noise abatement measures were considered for impacted receptors on the west side of South Capitol Street. Typically, 1st row receptors were impacted while back row receptors were shielded by intervening buildings. Impacts included categories B and E noise-sensitive receptors for the following land uses: townhomes with front doors facing South Capitol Street (where frequent exterior human use was observed), Camden South Capitol Apartments (with 2nd story and higher level balconies facing South Capitol Street), and retail establishments (with entrances facing South Capitol Street). The placement of a noise barrier was determined not to be feasible because it would restrict pedestrian access to South Capitol Street. Allowance for pedestrian access would result in a non-continuous and in-effective noise barrier.
- **CNE-7:** noise abatement measures were considered for impacted categories B and E noise-sensitive receptors for the following land uses: townhomes with front doors facing South Capitol Street or M Street and a retail establishment with its entrance facing South Capitol Street. An effective noise barrier will need to be located adjacent to impacted noise receptors within the M Street existing right-of-way. The placement of a noise barrier was determined not to be feasible

because it would restrict pedestrian and vehicular access to M Street. Allowance for pedestrian/vehicular access would result in an in-effective noise barrier.

- **CNE-8:** noise abatement measures were considered for impacted Category C noise-sensitive receptors 1400 and 1401 (i.e., St. Vincent De Paul entrance on South Capitol Street and outdoor seating on M Street.) To be effective, a continuous noise barrier would need to be constructed around the church property. The placement of a noise barrier was determined not to be feasible because it would restrict pedestrian access to South Capitol Street and M Street. Receptor 1400 could potentially also be considered a Category D receptor with interior noise-sensitive use. The church structure is masonry and has no operable windows, so per FHWA guidance a 25 dB interior/exterior noise reduction factor would be used to estimate the interior noise levels based on the predicted outdoor noise level. The resulting interior noise level would be 45 dBA (70 – 25), which is below the 51 dBA Category D NAC. As a result, there is no interior noise impact at Receptor 1400 which to consider for mitigation.

6.3 Noise Abatement Incorporation into the Record of Decision

Per 23 CFR part 772.13(g)(3) the ROD for the SDEIS will include locations where noise impacts are predicted to occur, where noise abatement is feasible and reasonable, and locations with impacts that have no feasible or reasonable noise abatement alternatives. The statement of likelihood will also be included in the SDEIS and ROD.

7.0 References

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Appendix A

Noise Study Plans

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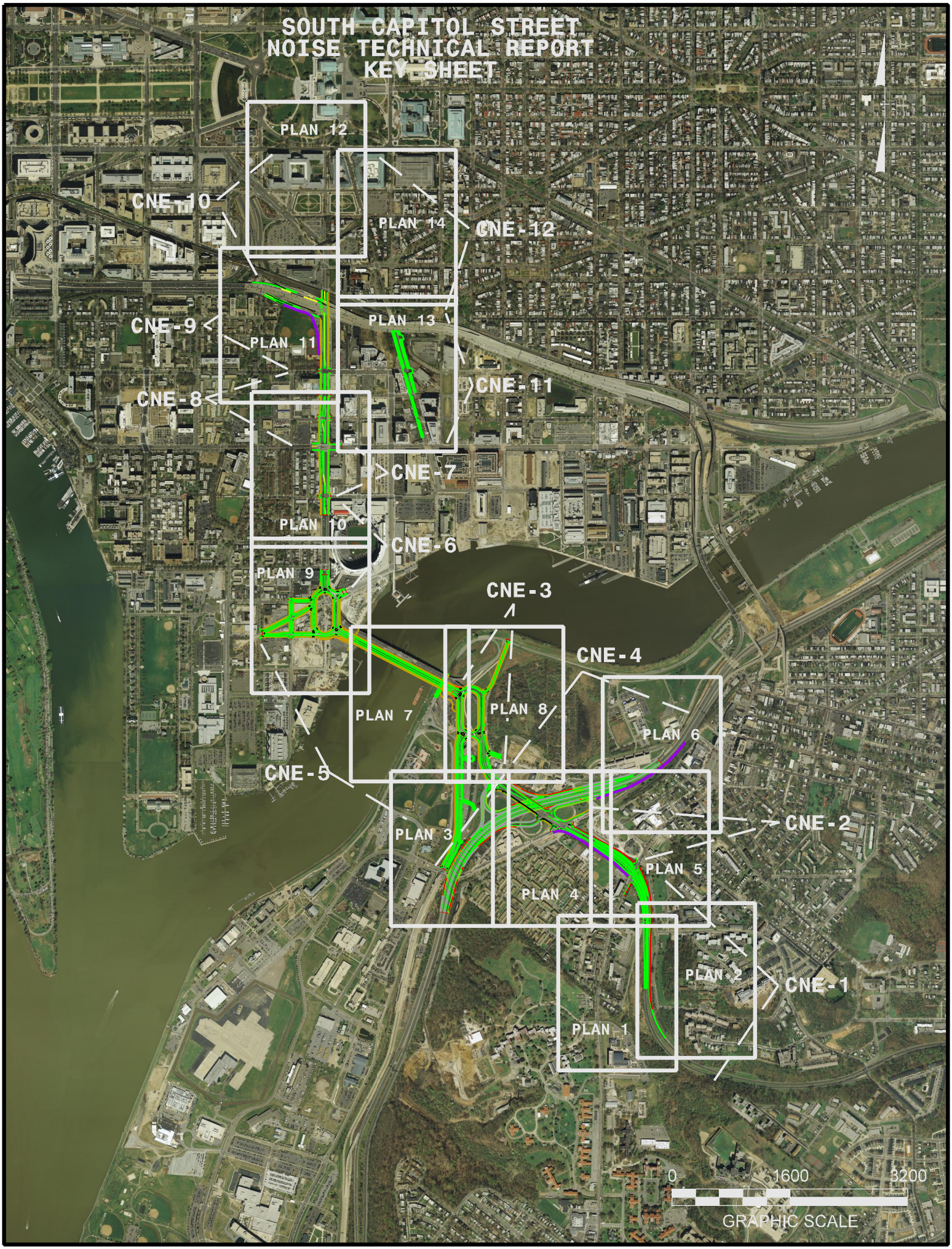
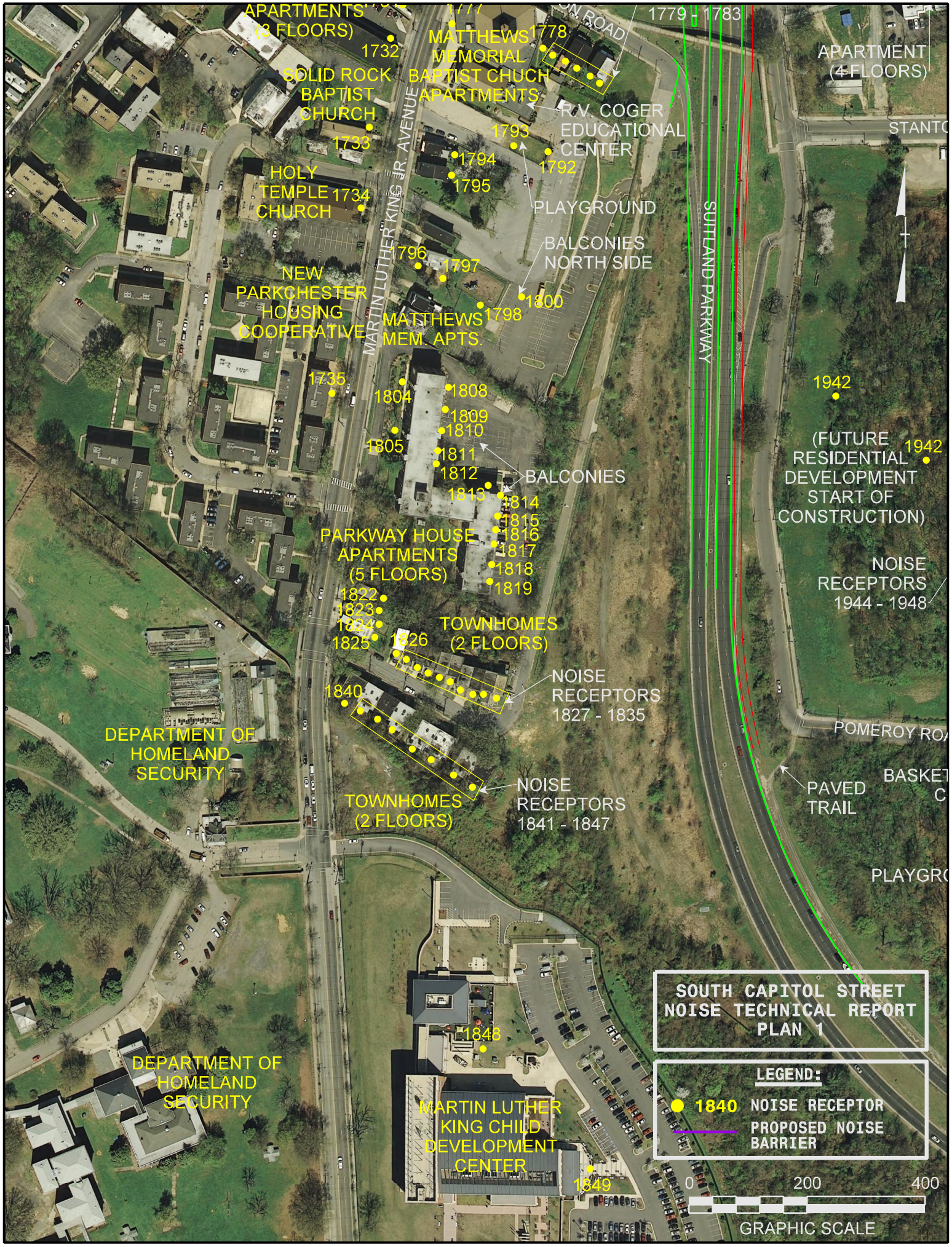
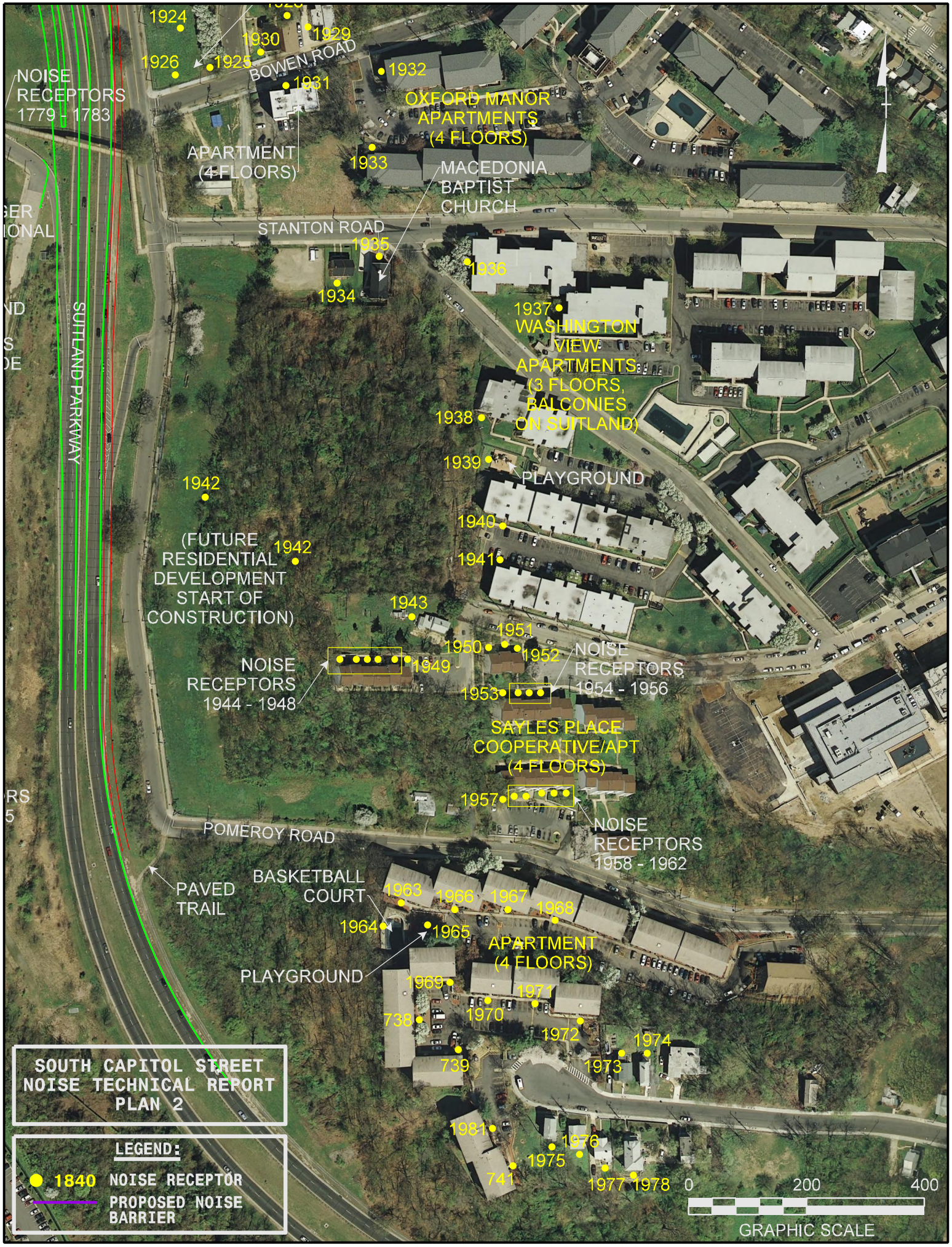
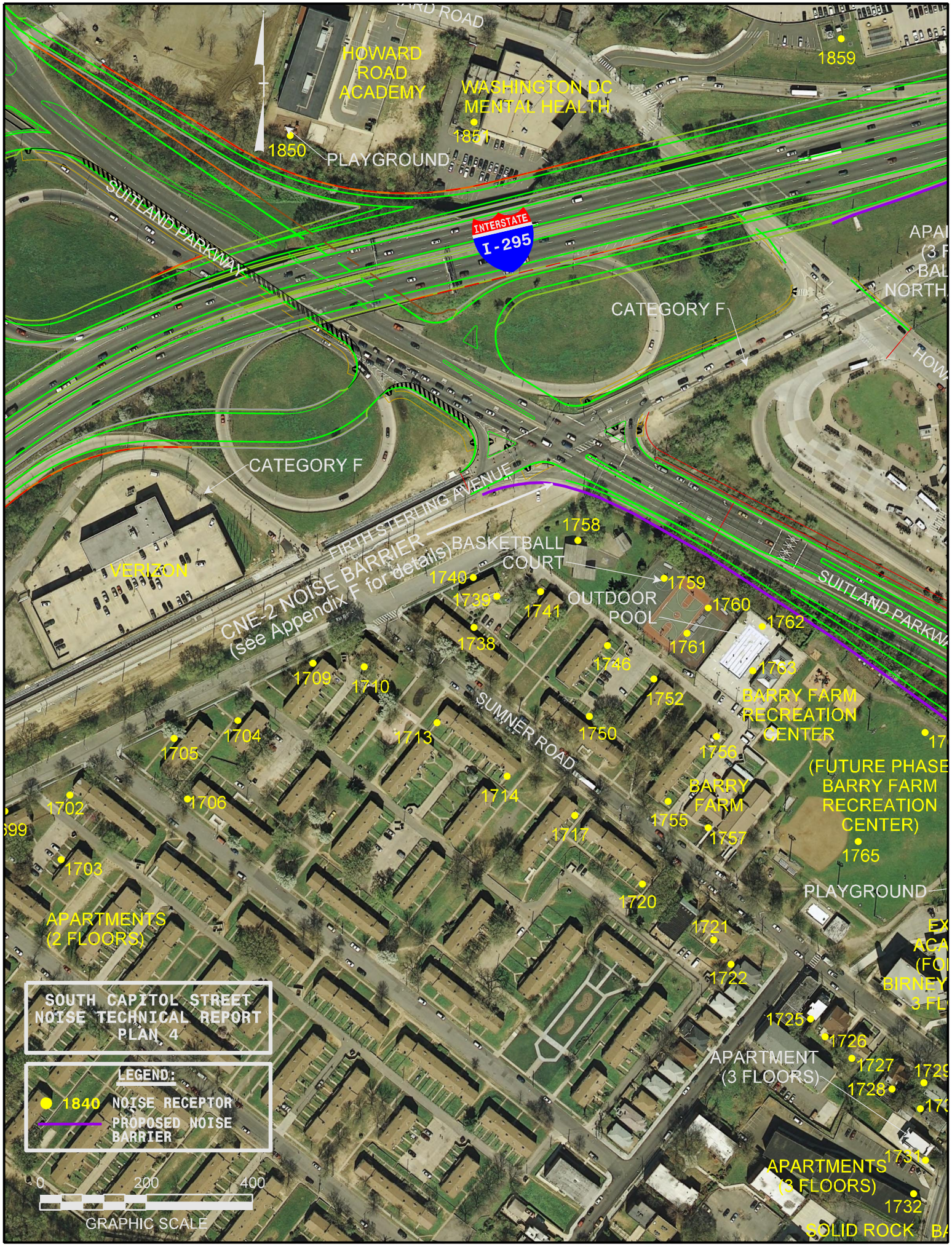
SOUTH CAPITOL STREET NOISE TECHNICAL REPORT KEY SHEET



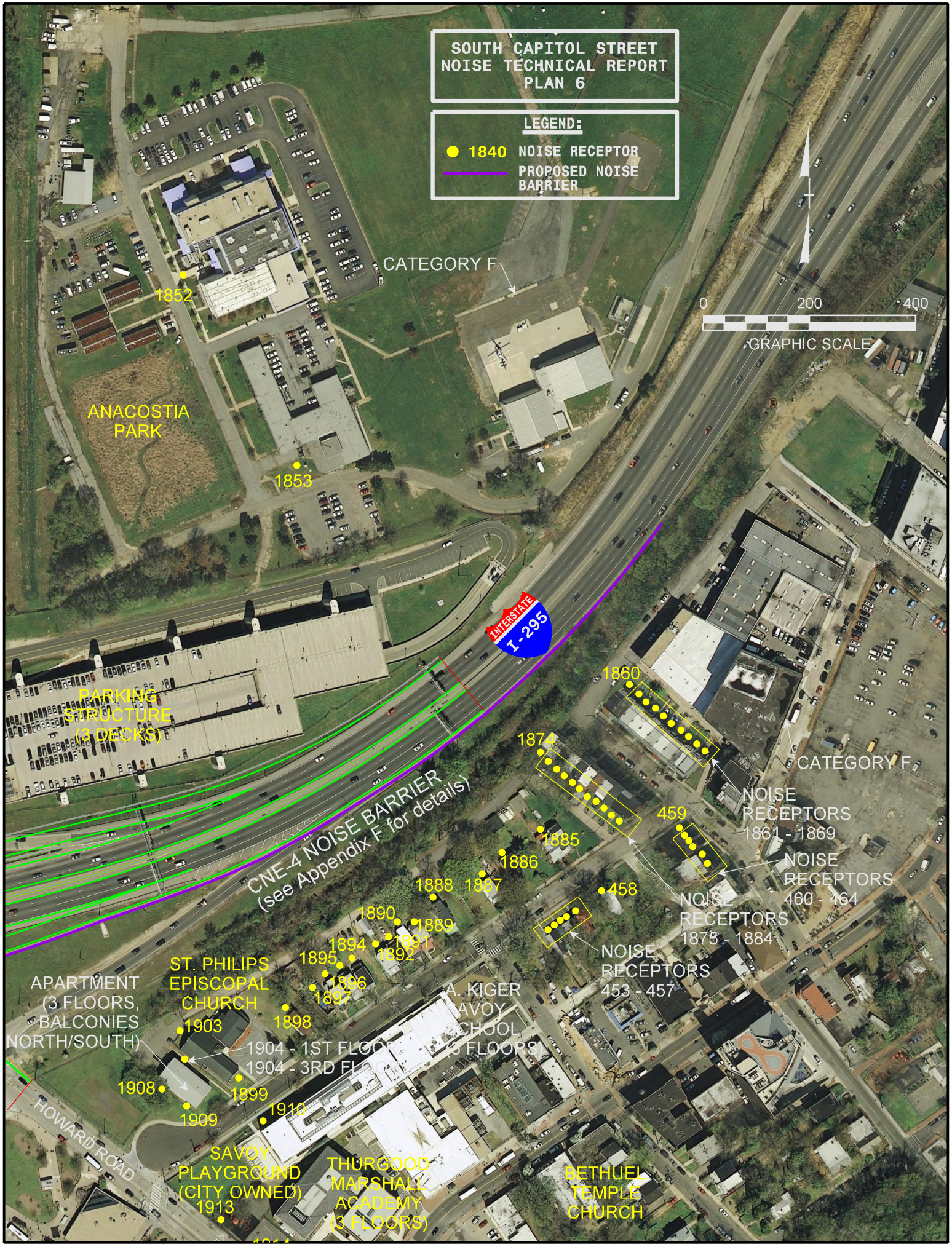

APARTMENTS
(3 FLOORS)
1732
SOLID ROCK
BAPTIST
CHURCH
1733
HOLY
TEMPLE
CHURCH
1734
NEW
PARKCHESTER
HOUSING
COOPERATIVE
1735
MATTHEWS
MEMORIAL
BAPTIST CHUCH
APARTMENTS
1778
1779 - 1783
R.V. COGER
EDUCATIONAL
CENTER
1793
1792
1794
1795
PLAYGROUND
BALCONIES
NORTH SIDE
1796
1797
1798
1800
MATTHEWS
MEM. APTS.
MARTIN LUTHER KING JR. AVENUE
SUITLAND PARKWAY
APARTMENT
(4 FLOORS)
1942
(FUTURE
RESIDENTIAL
DEVELOPMENT
START OF
CONSTRUCTION)
1942
NOISE
RECEPTORS
1944 - 1948
1804
1808
1809
1810
1805
1811
1812
1813
BALCONIES
1814
1815
1816
1817
1818
1819
PARKWAY HOUSE
APARTMENTS
(5 FLOORS)
1822
1823
1824
1825
1826
TOWNHOMES
(2 FLOORS)
NOISE
RECEPTORS
1827 - 1835
1840
DEPARTMENT OF
HOMELAND
SECURITY
TOWNHOMES
(2 FLOORS)
NOISE
RECEPTORS
1841 - 1847
PAVED
TRAIL
POMEROY RO
BASKET
C
PLAYGRO
1848
DEPARTMENT OF
HOMELAND
SECURITY
MARTIN LUTHER
KING CHILD
DEVELOPMENT
CENTER
1849
SOUTH CAPITOL STREET
NOISE TECHNICAL REPORT
PLAN 1
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE
BARRIER
0
200
400
GRAPHIC SCALE


1924
1930
1929
1926
1925
BOWEN ROAD
1931
1932
NOISE RECEPTORS 1779 - 1783
OXFORD MANOR APARTMENTS (4 FLOORS)
APARTMENT (4 FLOORS)
1933
MACEDONIA BAPTIST CHURCH
STANTON ROAD
1935
1936
1934
1937
WASHINGTON VIEW APARTMENTS (3 FLOORS, BALCONIES ON SUITLAND)
SUITLAND PARKWAY
1938
1939
PLAYGROUND
1942
1940
(FUTURE RESIDENTIAL DEVELOPMENT START OF CONSTRUCTION)
1942
1941
1943
1951
1950
1952
NOISE RECEPTORS 1944 - 1948
1949
NOISE RECEPTORS 1954 - 1956
1953
SAYLES PLACE COOPERATIVE/APT (4 FLOORS)
1957
NOISE RECEPTORS 1958 - 1962
POMEROY ROAD
PAVED TRAIL
BASKETBALL COURT
1963
1966
1967
1968
1964
1965
APARTMENT (4 FLOORS)
PLAYGROUND
1969
1971
1970
738
1972
1974
739
1973
1981
1976
1975
741
1977
1978
SOUTH CAPITOL STREET NOISE TECHNICAL REPORT PLAN 2
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0
200
400
GRAPHIC SCALE

US NAVY PROPERTY
1673
CATEGORY F
SOCCER FIELD
1674
BASKETBALL COURT
1676
1675
BASEBALL STANDS
BASEBALL STANDS
1677
1678
MILITARY BUSINESS OFFICE
ANACOSTIA NAVAL AIR STATION
DEFENSE BOULEVARD
INTERSTATE
I-295
1686
MILITARY BUSINESS OFFICE
1702
1699
1696
1703
1692
1695
1689
1690
1691
APARTME
(2 FLOOR
SOUTH CAPITOL STREET
NOISE TECHNICAL REPORT
PLAN 3
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0
200
400
GRAPHIC SCALE


HOWARD ROAD
HOWARD ROAD ACADEMY
WASHINGTON DC MENTAL HEALTH
1859
1850
1851
PLAYGROUND
SUITLAND PARKWAY
INTERSTATE
I-295
CATEGORY F
CATEGORY F
FIRTH STERLING AVENUE
CNE-2 NOISE BARRIER (see Appendix F for details)
VERIZON
BASKETBALL COURT
1758
1759
1740
1739
1741
OUTDOOR POOL
1760
1762
1761
1763
1738
1746
1752
1709
1710
SUMNER ROAD
BARRY FARM RECREATION CENTER
1750
1713
1704
1705
1756
(FUTURE PHASE BARRY FARM RECREATION CENTER)
1714
BARRY FARM
1702
1706
1755
1757
1717
1765
1703
PLAYGROUND
1720
APARTMENTS (2 FLOORS)
1721
1722
1725
1726
APARTMENT (3 FLOORS)
1727
1728
APARTMENTS (3 FLOORS)
1731
1732
SOLID ROCK
SOUTH CAPITOL STREET NOISE TECHNICAL REPORT PLAN 4
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0
200
400
GRAPHIC SCALE

SOUTH CAPITOL STREET
NOISE TECHNICAL REPORT
PLAN 5
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0 200 400
GRAPHIC SCALE
INTERSTATE
I-295
CNE-4 NOISE BARRIER
(see Appendix F for details)
NOISE RECEPTORS
1861 - 1869
NOISE RECEPTORS
1875 - 1884
NOISE RECEPTORS
453 - 457
ST. PHILIPS EPISCOPAL CHURCH
APARTMENT (3 FLOORS, BALCONIES NORTH/SOUTH)
1904 - 1ST FLOOR
1904 - 3RD FL
A. KIGER SAVOY SCHOOL (3 FLOORS)
HOWARD ROAD
SAVOY PLAYGROUND (CITY OWNED)
THURGOOD MARSHALL ACADEMY (3 FLOORS)
BETHUEL TEMPLE CHURCH
ANACOSTIA METRO STATION
BASKETBALL COURT
DR. CALVIN W. ROLARK MEMORIAL BUILDING
UNITED HOUSE OF PRAYER FOR ALL PEOPLE
SUITLAND PARKWAY
BETHLEHEM BAPTIST CHURCH
HOWARD ROAD
CHILDREN'S CENTER
(FUTURE PHASE BARRY FARM RECREATION CENTER)
PLAYGROUND
EXCEL ACADEMY (FORMER BIRNEY SCHOOL 3 FLOORS)
MARTIN LUTHER KING JR. AVENUE
SHERIDAN ROAD
SHERIDAN STATION APARTMENTS (5 FLOORS)
PLAYGROUND
SHERIDAN STATION CONDOS (4 FLOORS)
POTENTIAL OUTDOOR USE SOUTH SIDE OF BUILDING
CAMPBELL AME CHURCH
STANTON ROAD
NOISE RECEPTORS
1779 - 1783
BOWEN ROAD
OXFORD MANOR APARTMENTS (4 FLOORS)
APARTMENT (4 FLOORS)
MATTHEWS MEMORIAL BAPTIST CHUCH
SOLID ROCK
MACEDONIA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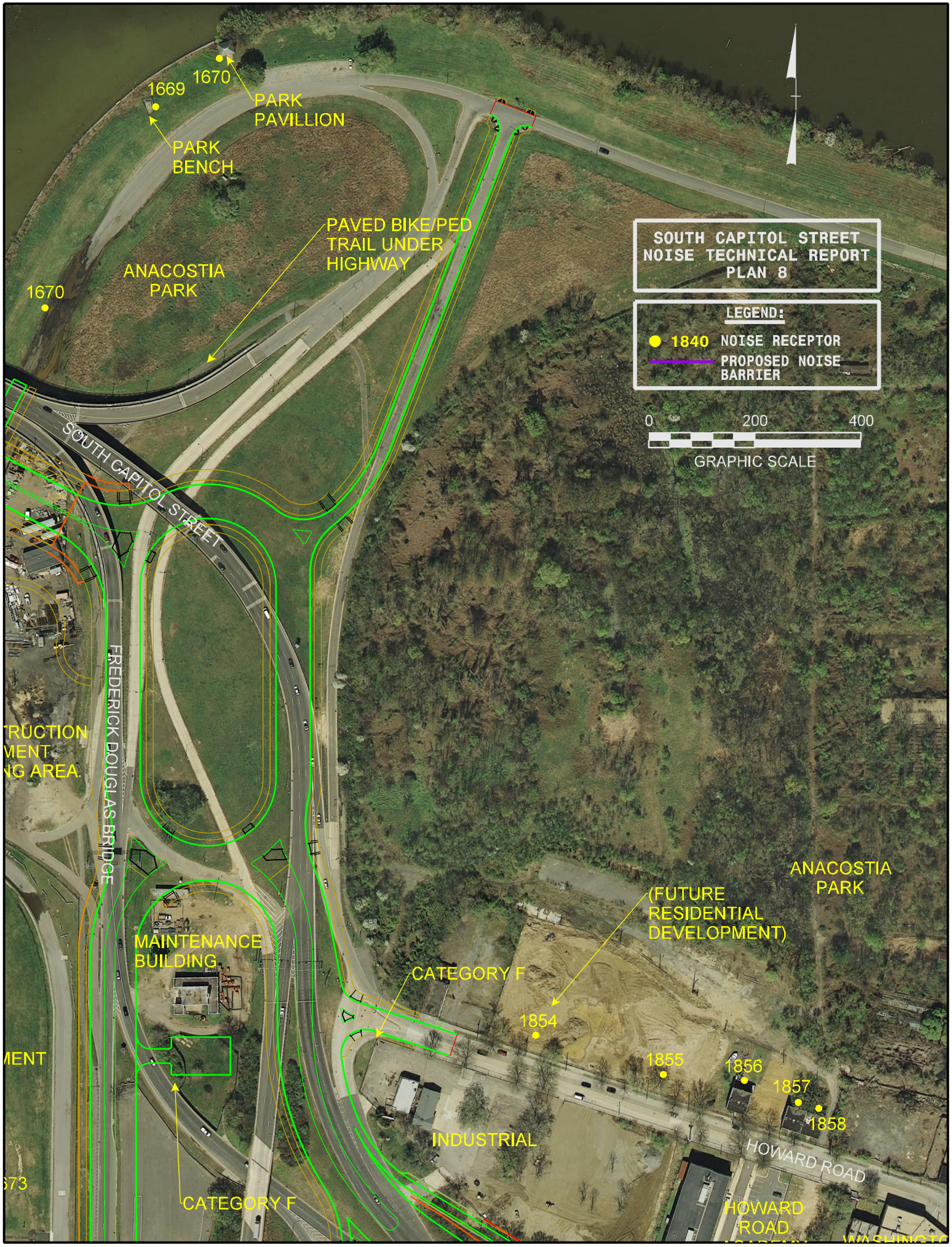
PLAN 6
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0
200
400
GRAPHIC SCALE
CATEGORY F
1852
ANACOSTIA PARK
1853
INTERSTATE
I-295
PARKING STRUCTURE (3 DECKS)
CNE-4 NOISE BARRIER (see Appendix F for details)
1860
1874
CATEGORY F
NOISE RECEPTORS 1861 - 1869
459
1885
1886
NOISE RECEPTORS 460 - 464
1888
1887
458
NOISE RECEPTORS 1875 - 1884
1890
1889
1894
1891
1892
1895
NOISE RECEPTORS 453 - 457
ST. PHILIPS EPISCOPAL CHURCH
1896
1897
A. KIGER SAVOY SCHOOL (3 FLOORS)
APARTMENT (3 FLOORS, BALCONIES NORTH/SOUTH)
1903
1898
1904 - 1ST FLOOR
1904 - 3RD FLOOR
1908
1899
1909
1910
HOWARD ROAD
SAVOY PLAYGROUND (CITY OWNED)
1913
THURGOOD MARSHALL ACADEMY (3 FLOORS)
BETHUEL TEMPLE CHURCH

FREDERICK DOUGLAS BRIDGE
FREDERICK DOUGLAS BRIDGE
1669
1670
ANACOS
PARK
SOUTH CAPITOL STR
FREDERICK DOUGLAS BRIDGE
CONSTRUCTION
EQUIPMENT
STAGING AREA
PARK
PAVILLION
1671
MAINTE
BUILDI
1672
CHILD
DEVELOPMENT
CENTEER/
PARK
BENCHES
TENNIS
COURTS
US NAVY
PROPERTY
1673
SOUTH CAPITOL STREET
NOISE TECHNICAL REPORT
PLAN 7
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE
BARRIER
0
200
400
GRAPHIC SCALE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NOISE TECHNICAL REPORT
PLAN 8
LEGEND:
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PROPOSED NOISE BARRIER
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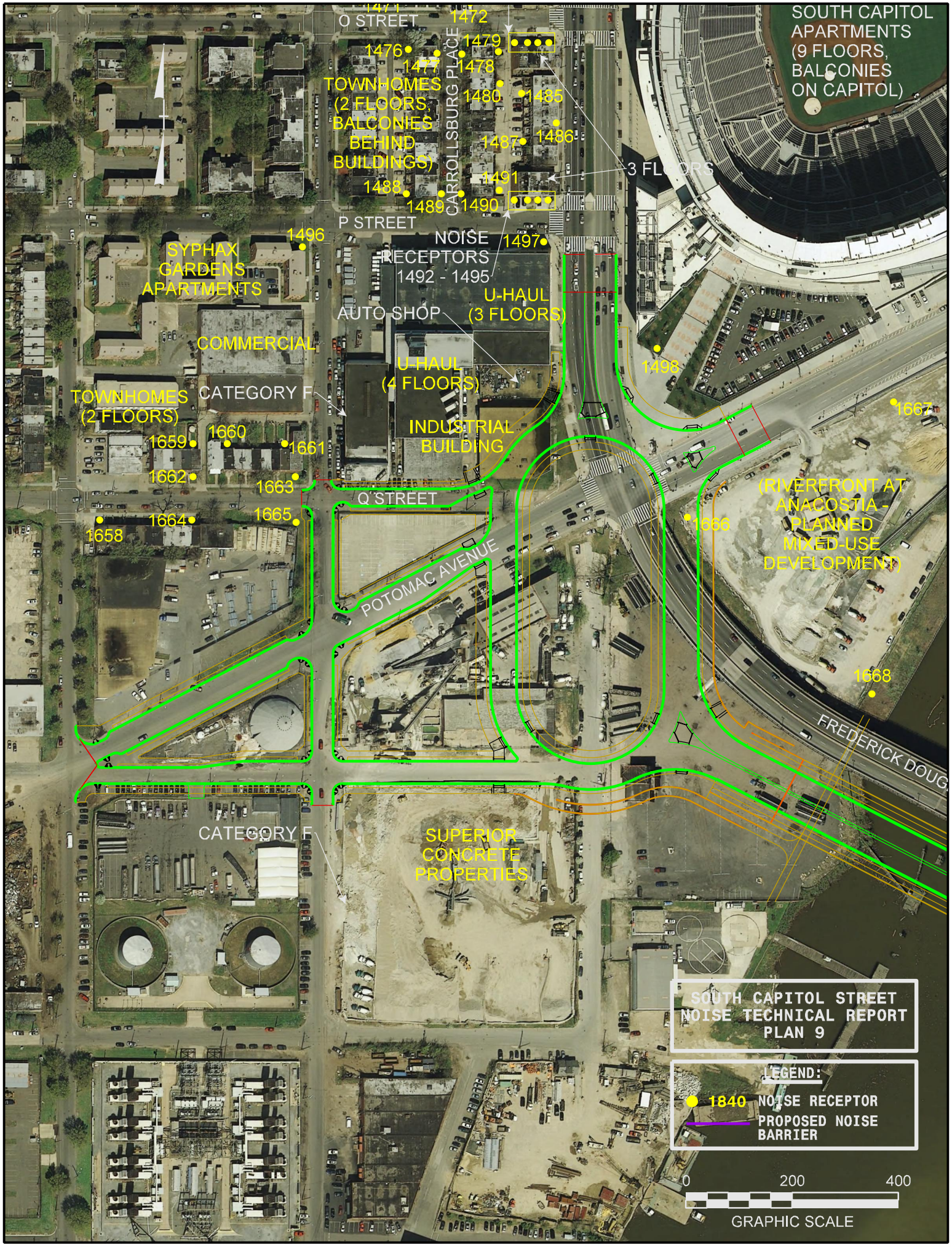
GRAPHIC SCALE
1670
1669
1670
PARK PAVILLION
PARK BENCH
PAVED BIKE/PED TRAIL UNDER HIGHWAY
ANACOSTIA PARK
SOUTH CAPITOL STREET
FREDERICK DOUGLAS BRIDGE
MAINTENANCE BUILDING
CATEGORY F
CATEGORY F
(FUTURE RESIDENTIAL DEVELOPMENT)
ANACOSTIA PARK
1854
1855
1856
1857
1858
INDUSTRIAL
HOWARD ROAD
HOWARD ROAD


O STREET
1471
1472
1476
1477
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1491
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1498
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
CARROLLSBURG PLACE
TOWNHOMES (2 FLOORS, BALCONIES BEHIND BUILDINGS)
SOUTH CAPITOL APARTMENTS (9 FLOORS, BALCONIES ON CAPITOL)
3 FLOORS
P STREET
NOISE RECEPTORS 1492 - 1495
SYPHAX GARDENS APARTMENTS
U-HAUL (3 FLOORS)
AUTO SHOP
COMMERCIAL
U-HAUL (4 FLOORS)
TOWNHOMES (2 FLOORS)
CATEGORY F
INDUSTRIAL BUILDING
Q STREET
(RIVERFRONT AT ANACOSTIA - PLANNED MIXED-USE DEVELOPMENT)
POTOMAC AVENUE
FREDERICK DOUG
CATEGORY F
SUPERIOR CONCRETE PROPERTIES
SOUTH CAPITOL STREET NOISE TECHNICAL REPORT PLAN 9
LEGEND:
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PROPOSED NOISE BARRIER
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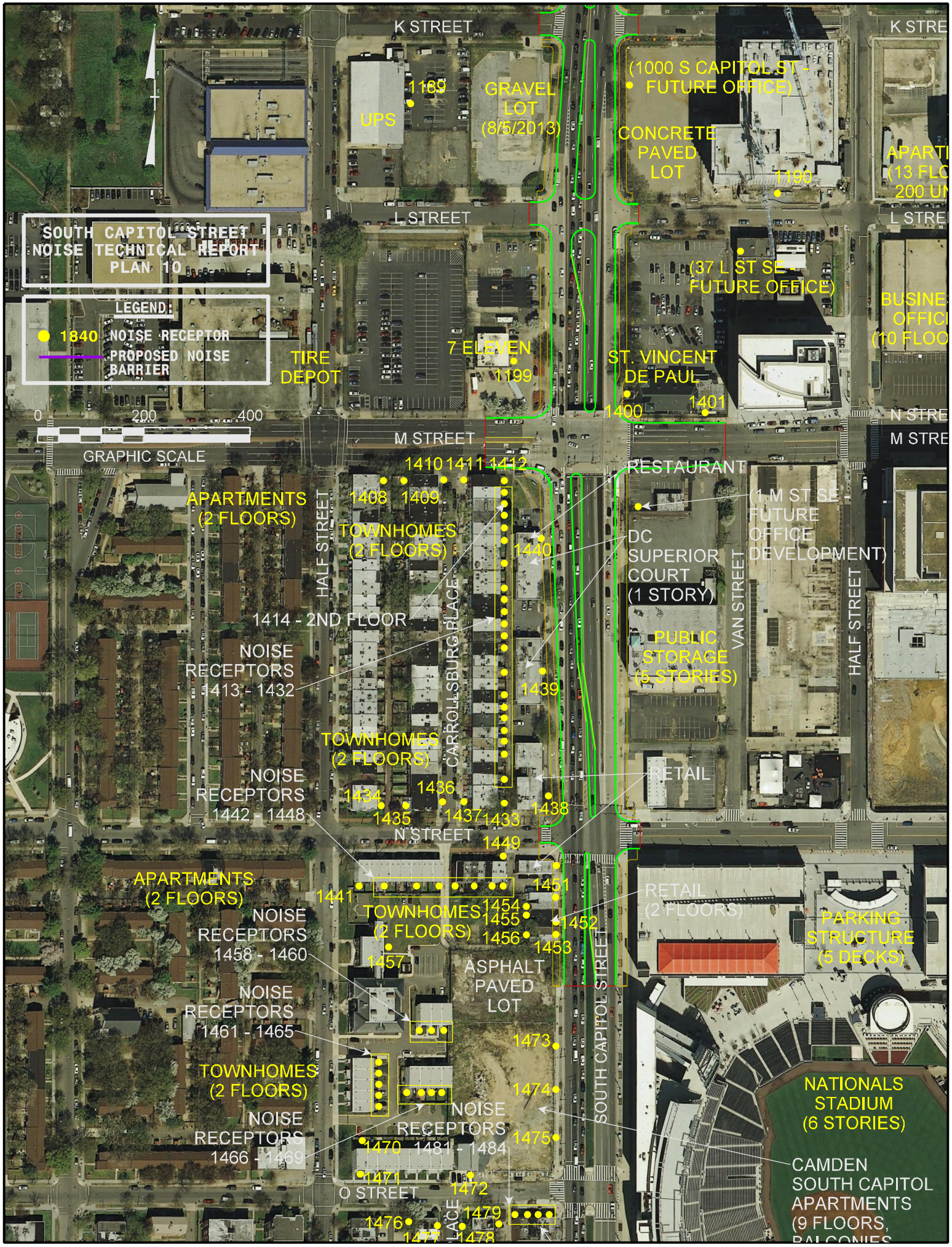
200
400
GRAPHIC SCALE


SOUTH CAPITOL STREET
NOISE TECHNICAL REPORT
PLAN 10
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0 200 400
GRAPHIC SCALE
K STREET
L STREET
M STREET
N STREET
O STREET
HALF STREET
CARROLLSBURG PLACE
VAN STREET
SOUTH CAPITOL STREET
UPS
1185
GRAVEL LOT (8/5/2013)
(1000 S CAPITOL ST - FUTURE OFFICE)
CONCRETE PAVED LOT
1190
(37 L ST SE - FUTURE OFFICE)
TIRE DEPOT
7 ELEVEN
1199
ST. VINCENT DE PAUL
1400
1401
RESTAURANT
(1 M ST SE - FUTURE OFFICE DEVELOPMENT)
DC SUPERIOR COURT (1 STORY)
PUBLIC STORAGE (5 STORIES)
APARTMENTS (2 FLOORS)
1408 1409
1410 1411 1412
TOWNHOMES (2 FLOORS)
1440
1414 - 2ND FLOOR
NOISE RECEPTORS 1413 - 1432
1439
TOWNHOMES (2 FLOORS)
NOISE RECEPTORS 1442 - 1448
1434 1435 1436 1437 1433 1438
1449
RETAIL
APARTMENTS (2 FLOORS)
1441
1451
TOWNHOMES (2 FLOORS)
1454 1455 1456 1452 1453
RETAIL (2 FLOORS)
PARKING STRUCTURE (5 DECKS)
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1457
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NOISE RECEPTORS 1461 - 1465
1473
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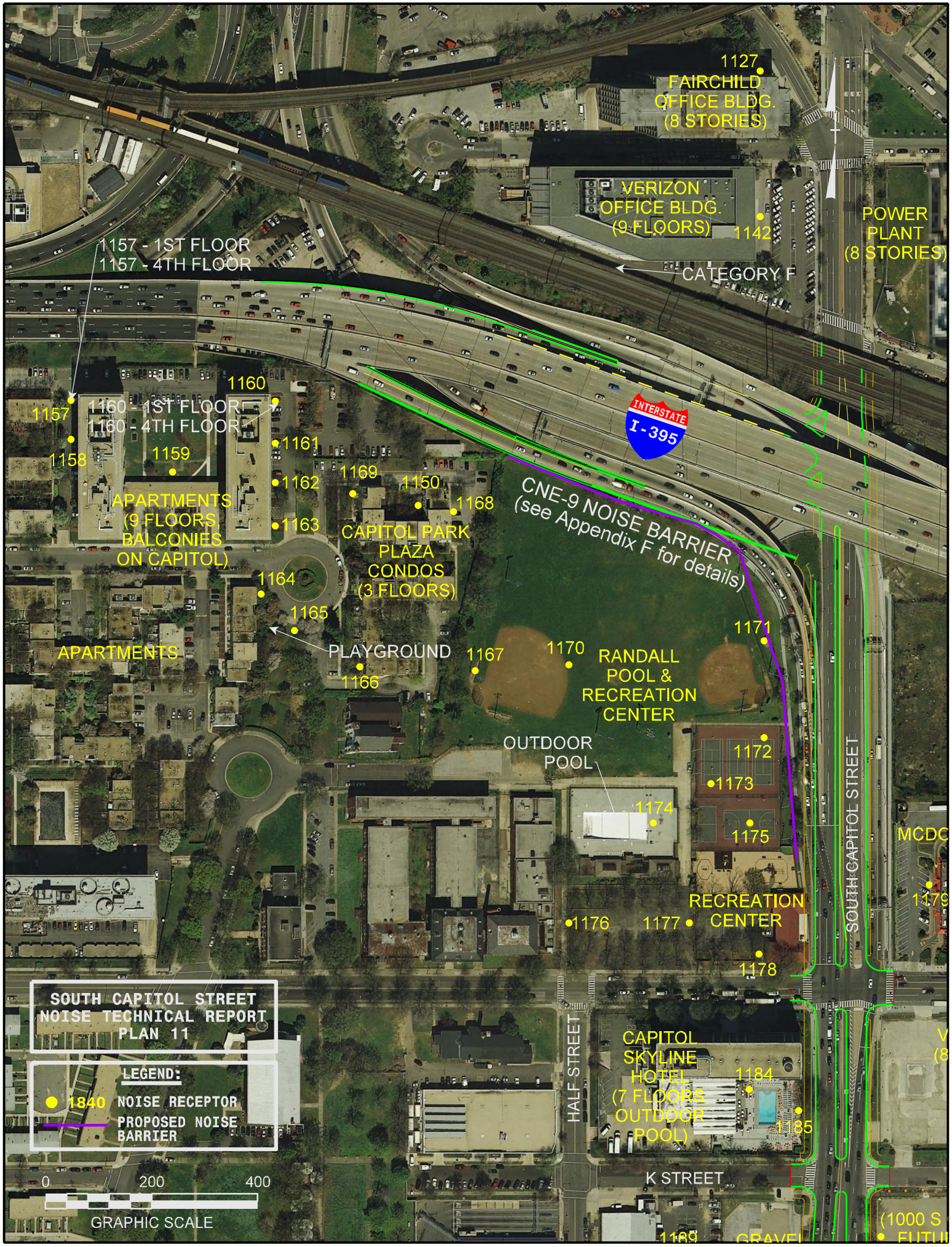
1474
NOISE RECEPTORS 1466 - 1469
NOISE RECEPTORS 1470 1481 - 1484
1475
NATIONALS STADIUM (6 STORIES)
1471
1472
1476 1477 1478 1479
CAMDEN SOUTH CAPITOL APARTMENTS (9 FLOORS, BALCONIES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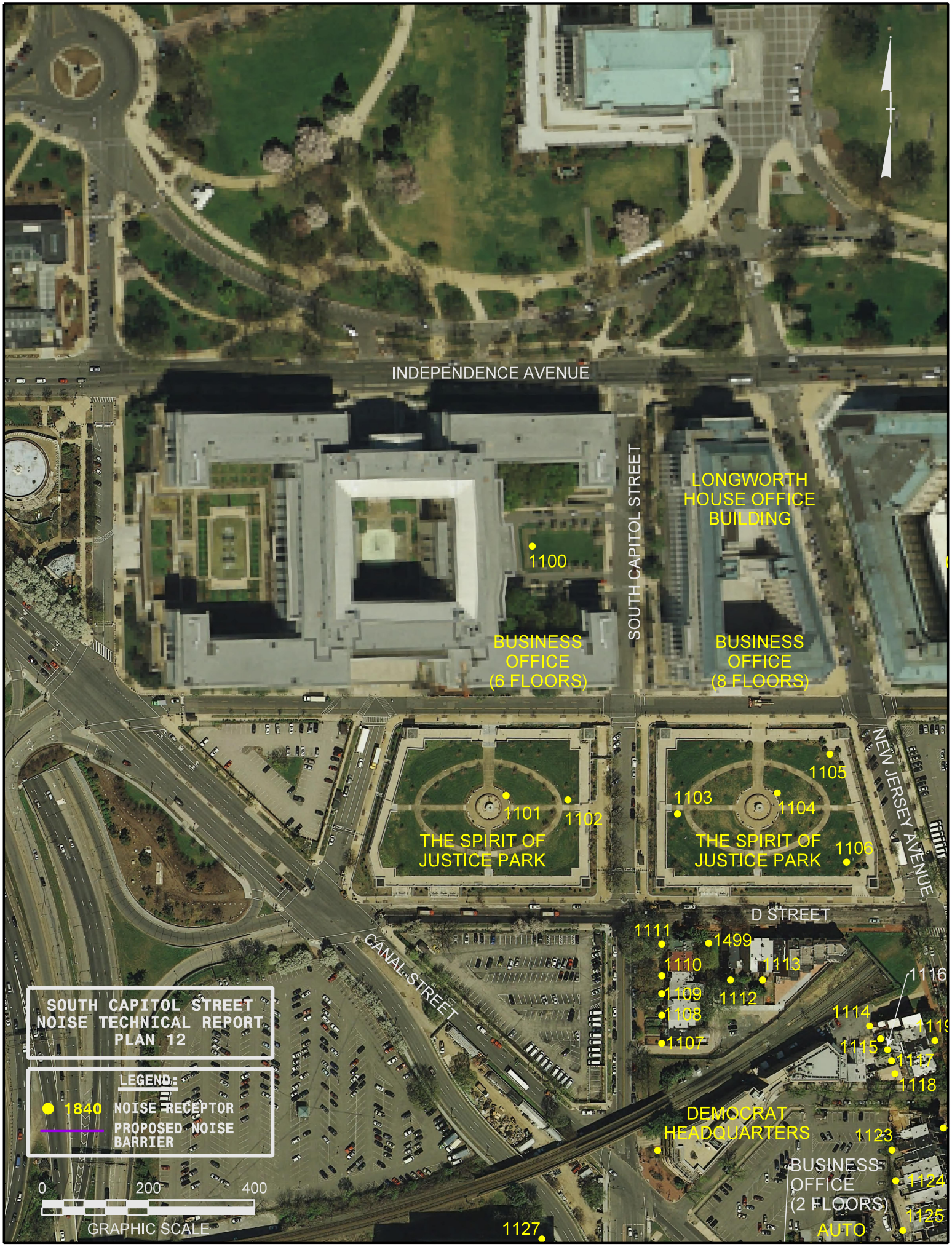
FAIRCHILD OFFICE BLDG. (8 STORIES)
VERIZON OFFICE BLDG. (9 FLOORS)
1142
POWER PLANT (8 STORIES)
CATEGORY F
1157 - 1ST FLOOR
1157 - 4TH FLOOR
1160
1157
1160 - 1ST FLOOR
1160 - 4TH FLOOR
1158
1159
1161
1162
1163
1169
1150
1168
APARTMENTS (9 FLOORS BALCONIES ON CAPITOL)
CAPITOL PARK PLAZA CONDOS (3 FLOORS)
INTERSTATE I-395
CNE-9 NOISE BARRIER (see Appendix F for details)
1164
1165
APARTMENTS
PLAYGROUND
1166
1167
1170
RANDALL POOL & RECREATION CENTER
1171
OUTDOOR POOL
1172
1173
1174
1175
SOUTH CAPITOL STREET
MCDC
1179
RECREATION CENTER
1176
1177
1178
SOUTH CAPITOL STREET NOISE TECHNICAL REPORT PLAN 11
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
HALF STREET
CAPITOL SKYLINE HOTEL (7 FLOORS OUTDOOR POOL)
1184
1185
K STREET
0
200
400
GRAPHIC SCALE
(1000 S
GRAVEL


INDEPENDENCE AVENUE
SOUTH CAPITOL STREET
LONGWORTH HOUSE OFFICE BUILDING
1100
BUSINESS OFFICE (6 FLOORS)
BUSINESS OFFICE (8 FLOORS)
NEW JERSEY AVENUE
1105
1103
1104
1101
1102
THE SPIRIT OF JUSTICE PARK
THE SPIRIT OF JUSTICE PARK
1106
D STREET
1111
1499
1110
1113
1116
1109
1112
1108
1114
1107
1115
1117
1118
CANAL STREET
DEMOCRAT HEADQUARTERS
1123
BUSINESS OFFICE (2 FLOORS)
1124
1125
AUTO
1127
SOUTH CAPITOL STREET NOISE TECHNICAL REPORT PLAN 12
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PROPOSED NOISE BARRIER
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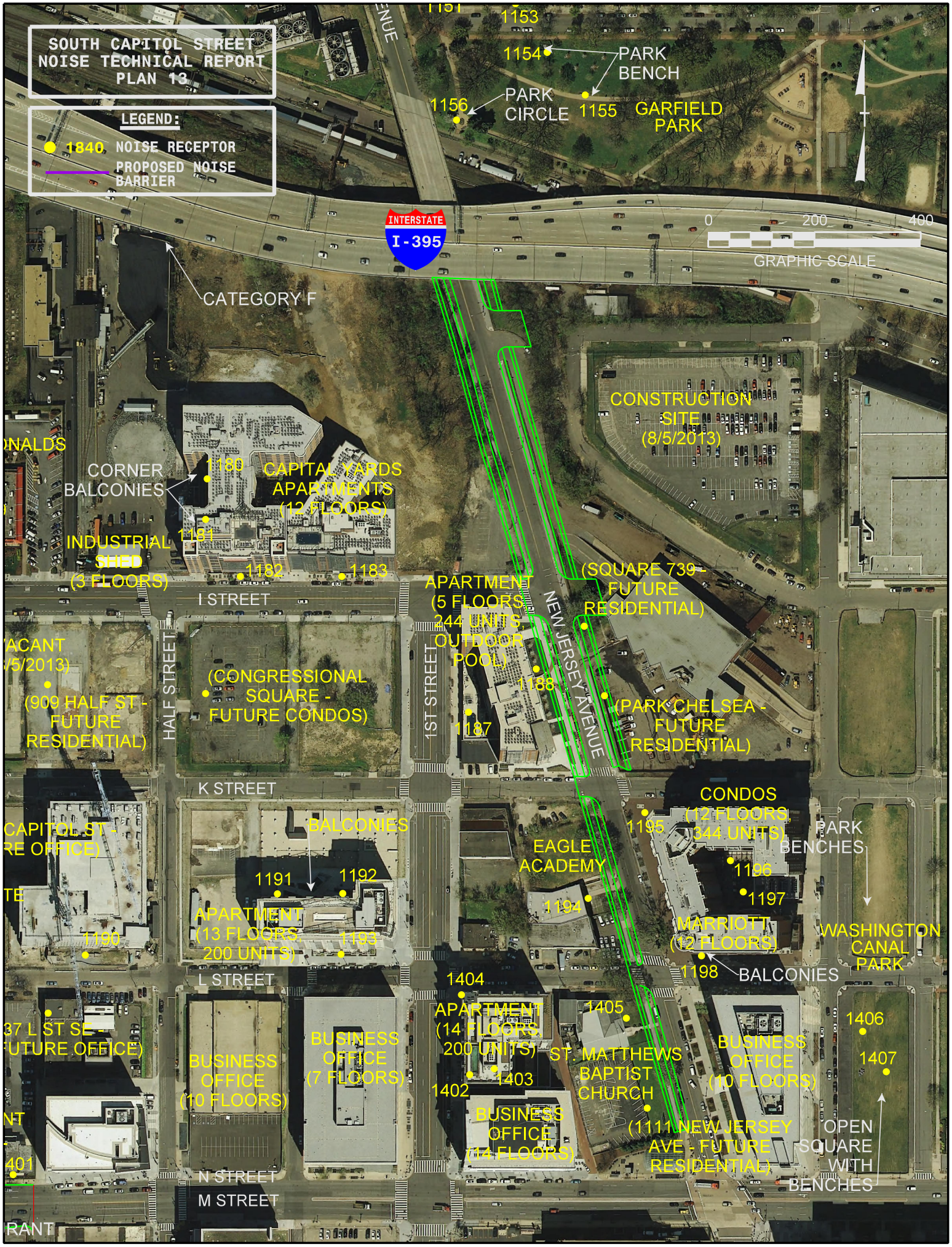
GRAPHIC SCALE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NOISE TECHNICAL REPORT
PLAN 13
LEGEND:
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PROPOSED NOISE BARRIER
1153
1154
PARK BENCH
1156
PARK CIRCLE
1155
GARFIELD PARK
INTERSTATE
I-395
0
200
400
GRAPHIC SCALE
CATEGORY F
CONSTRUCTION SITE (8/5/2013)
CORNER BALCONIES
1180
CAPITAL YARDS APARTMENTS (12 FLOORS)
1181
INDUSTRIAL SHED (3 FLOORS)
1182
1183
I STREET
APARTMENT (5 FLOORS, 244 UNITS, OUTDOOR POOL)
(SQUARE 739 - FUTURE RESIDENTIAL)
NEW JERSEY AVENUE
(909 HALF ST - FUTURE RESIDENTIAL)
HALF STREET
(CONGRESSIONAL SQUARE - FUTURE CONDOS)
1ST STREET
1188
1187
(PARK CHELSEA - FUTURE RESIDENTIAL)
K STREET
CONDOS (12 FLOORS, 344 UNITS)
1195
PARK BENCHES
BALCONIES
EAGLE ACADEMY
1196
1197
1191
1192
1194
APARTMENT (13 FLOORS, 200 UNITS)
1190
1193
MARRIOTT (12 FLOORS)
WASHINGTON CANAL PARK
1198
BALCONIES
L STREET
1404
APARTMENT (14 FLOORS, 200 UNITS)
1405
1406
1407
BUSINESS OFFICE (10 FLOORS)
BUSINESS OFFICE (7 FLOORS)
ST. MATTHEWS BAPTIST CHURCH
BUSINESS OFFICE (10 FLOORS)
1402
1403
BUSINESS OFFICE (14 FLOORS)
(1111 NEW JERSEY AVE - FUTURE RESIDENTIAL)
OPEN SQUARE WITH BENCHES
N STREET
M STREET

SOUTH CAPITOL STREET
NOISE TECHNICAL REPORT
PLAN 14
LEGEND:
1840 NOISE RECEPTOR
PROPOSED NOISE BARRIER
0
200
400
GRAPHIC SCALE
GWORTH
SE OFFICE
ILDING
BUSINESS
OFFICE
(5 FLOORS)
USINESS
OFFICE
FLOORS)
C STREET
NEW JERSEY AVENUE
1105
1104
SPIRIT OF
TICE PARK
1106
D STREET
99
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1128
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OCRAT
JARTERS
1135
1136
1123
1122
1137
BUSINESS
OFFICE
(2 FLOORS)
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1125
1121
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GARAGE
INSTITUTIONAL
1140
CATEGORY F
1146 - 1ST FLOOR
1146 - 2ND FLOOR
E STREET
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COMMERCIAL
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NEW JERSEY AVENUE
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1154
PARK

THE FOLLOWING APPENDICES ARE AVAILABLE UPON REQUEST FROM DDOT.

APPENDIX B – Laboratory Calibration, Field Calibration, Field Measurement Information
APPENDIX C – TNM® 2.5 Inputs
APPENDIX D – Existing Condition, 2040 No-Build, and 2040 Build Condition Traffic Volumes
APPENDIX E – TNM® 2.5 Predicted Noise Levels
APPENDIX F – Proposed Noise Barrier Plans
APPENDIX G – Noise Barrier Evaluation Spreadsheet

District Department of Transportation

appendix E

natural resources technical report

October 2014

submitted by:

PARSONS BRINCKERHOFF

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Appendix A: 2014 Wetland Delineation Data Sheets

1.0 Introduction

The District of Columbia Department of Transportation (DDOT), in cooperation with the Federal Highway Administration (FHWA), is proposing to replace the Frederick Douglass Memorial Bridge, reconstruct connecting roadways and interchanges, and add streetscape features in the South Capitol Street Project Area. This proposed action would improve safety, multimodal mobility, and accessibility, and support economic development. The Final Environmental Impact Statement (FEIS) approved in 2011, examined the proposed action between Suitland Parkway at Martin Luther King, Jr. Avenue SE on the southeast end of the corridor and D Street on the north end of the corridor (see Figure 1). Decisions about the Project made since approval of the 2011 FEIS resulted in major changes to the design of the project. The most notable decision involved relocating the proposed new Frederick Douglass Memorial Bridge on an alignment immediately south of and parallel to the existing bridge. In addition, new information about current and planned navigation, including the navigation requirements of the U.S. Navy (USN) along the Anacostia River, influenced the decision to include a fixed bridge among the Project alternatives. Therefore a Supplemental Draft Environmental Impact Statement (SDEIS) will be completed to discuss potential impacts to resources from this Revised Preferred Alternative. This document is a supplement to the Natural Resource Technical Report (NRTR) (DDOT 2007a). It incorporates updated data on natural resources within the Project Area, includes potential effects to natural resources associated with the Revised Preferred Alternative, and addresses how these changes may differ from those assessed in the original NRTR.

South Capitol Street was a primary corridor in L'Enfant's 1791 Plan for the City of Washington, and has always been envisioned as a symbolic gateway to the city and its Monumental Core. South Capitol Street connects downtown Washington, DC to neighborhoods in the Southeast and Southwest quadrants of the District of Columbia and Prince George's County, Maryland.

Today, South Capitol Street lacks any characteristics of its historic function as a gateway, and the street's present characteristics and conditions are not appropriate to its central place and important function. South Capitol Street is an urban freeway that has become a conduit for through traffic at the expense of serving the immediate needs of the residents and businesses in the corridor. The transportation infrastructure is in deteriorating condition, and fails to provide necessary connections to community destinations for pedestrians, bicyclists, transit riders, or motorists.

Despite the inadequacies of the transportation infrastructure in the corridor, new development is rapidly transforming former industrial and military uses into thriving mixed use communities and employment centers. Public investment is focused on new developments. This public investment has stimulated private investment in new residential, office, and retail developments throughout the corridor. The economic development of the South Capitol Street Corridor, and along the Anacostia River, is part of a District of Columbia and regional effort to revitalize the waterfront and clean up the river. The vision for the Anacostia Waterfront is an area that will unite the city economically, physically, and socially as the center of 21st century Washington and a cornerstone of the National Capital Region. South Capitol Street's transportation infrastructure must support and enhance this new vision of the Anacostia Waterfront.

1.1 Purpose and Need

The Purpose and Need of the Project remains the same as was described in the FEIS. In summary, the purpose of the South Capitol Street Project is to improve safety, multimodal mobility and accessibility, and support economic development. The Project would transform the existing corridor into an urban gateway to the U.S. Capitol and District of Columbia's Monumental Core. Transportation improvements were identified to incorporate long-term environmental sustainability and context sensitive design. Specifically, the project addresses the following needs.

Safety: The design and deteriorating condition of the transportation infrastructure in the corridor results in poor safety conditions for motorists, bicyclists, pedestrians, and transit riders.

Mobility: The lack of critical regional roadway connections and facilities for bicyclists and pedestrians support the need to improve mobility in the South Capitol Street Corridor.

Accessibility: Several key destinations in or adjacent to the corridor are difficult to reach using the existing transportation infrastructure. Grade separations, median barriers, and ramp and intersection configurations limit access to activity centers for motorists, bicyclists, pedestrians, and transit riders.

Economic Development: The density of employment and residential development forecasted for the area highlights the need to support economic growth. Public investments have increased employment and will stimulate additional private investment in new residential, office and retail developments. As economic development continues to occur within the Project Area, additional demand will continue to be placed on transportation infrastructure to meet future transportation needs.

1.2 Project Area

The South Capitol Street Project Area is located in the Southwest and Southeast quadrants of the District of Columbia adjacent to the Anacostia River (Figure 1). The northern boundary is at D Street at the U.S. Capitol. The eastern boundary follows 2nd Street SE west of the Anacostia River and expands to the east of the Anacostia Metrorail station parking deck north of Interstate 295 east of the river. The western boundary is just west of 2nd Street from Independence Avenue SW to T Street SW north of the Anacostia River and Mitscher Road SW in the Anacostia Naval Station. The Southern boundary of the Project Area is just south of the Barry Farms neighborhood (near the intersection of Wade and Stevens Roads SE) and includes a portion of St. Elizabeths West Campus.

1.3 Alternatives

There are two Build Alternatives currently under study for the South Capitol Street project, the FEIS Preferred Alternative (
Figure 2) and the Revised Preferred Alternative (Figure 3). Each of the Build Alternatives meets the purpose and need for the project and is the result of extensive public and agency coordination.

Figure 1: Project Area

Figure 2: FEIS Preferred Alternative

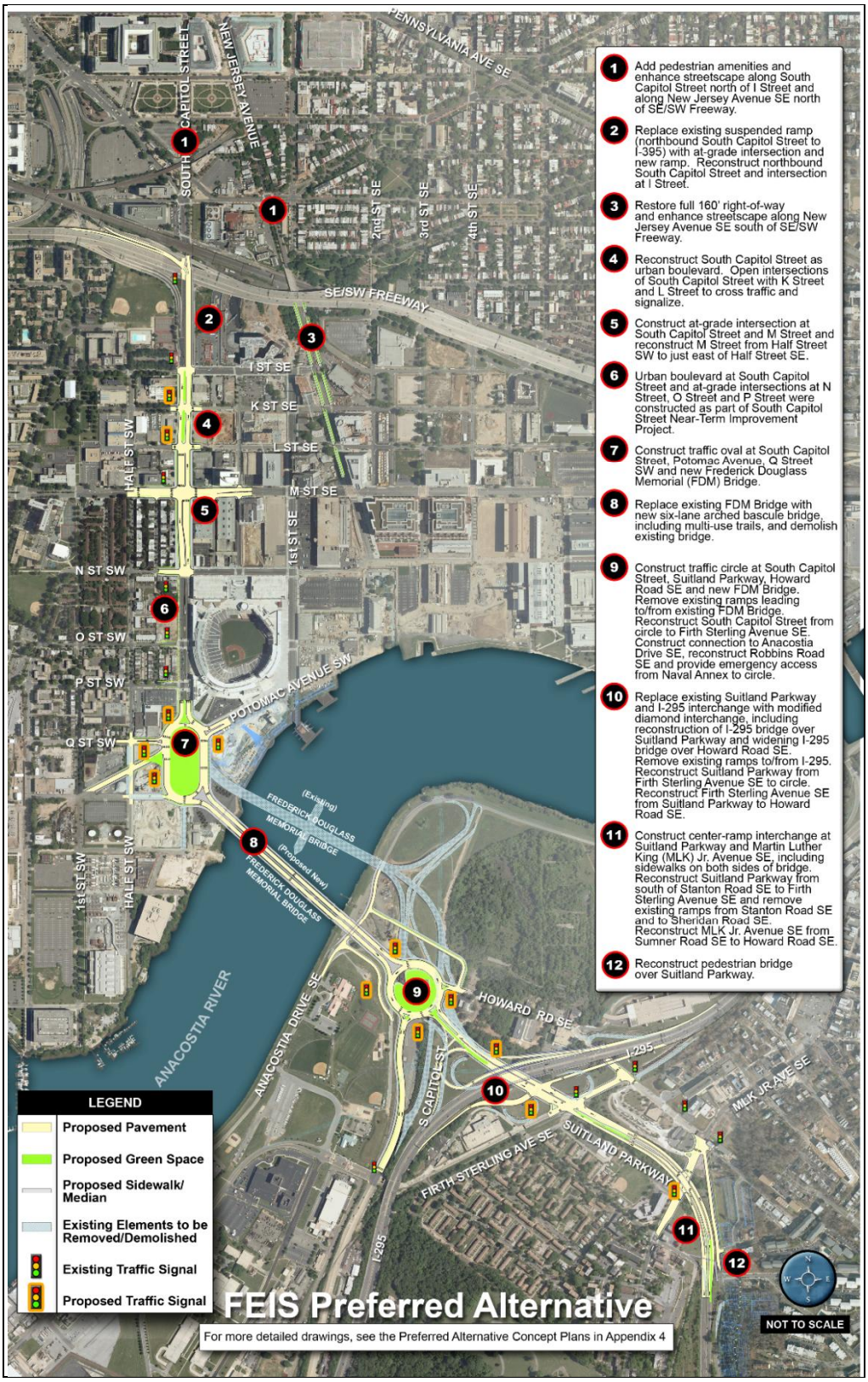
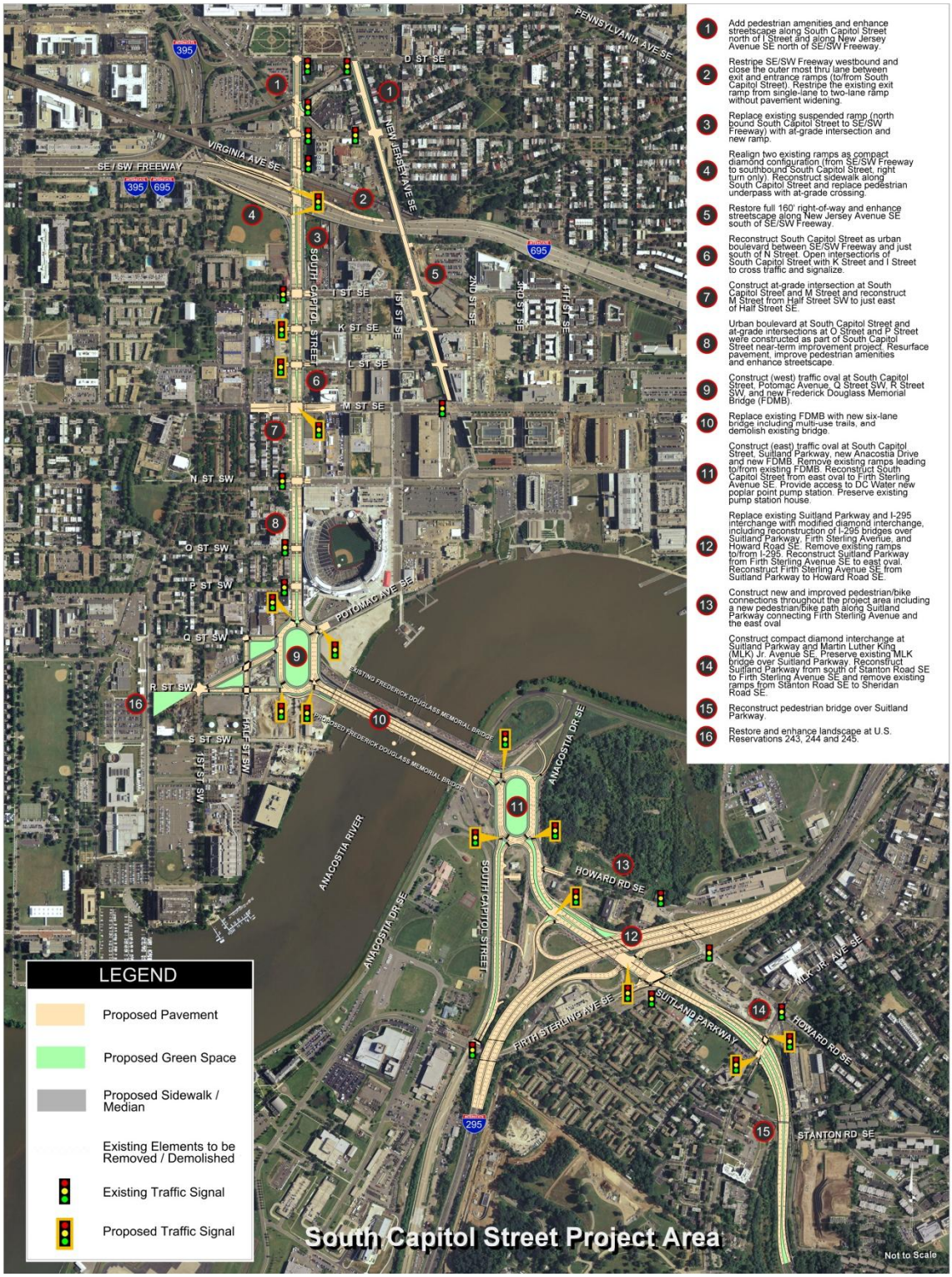


Figure 3: Revised Preferred Alternative



1.3.1 Summary of FEIS Preferred Alternative

The major components of the South Capitol Street FEIS Preferred Alternative would include:

- Rebuild South Capitol Street as a six-lane boulevard with landscaped median west of the Anacostia River.
- Reconstruct at-grade intersections along South Capitol Street at I, N, O, P, K, L, and M streets.
- Reconstruct the existing ramp from northbound South Capitol Street to I-395 as an at-grade intersection.
- Construct a four-lane signalized traffic oval connecting South Capitol Street, Potomac Avenue, and Q Street SW.
- Replace the existing Frederick Douglass Memorial Bridge with an arched bascule bridge that includes bicycle and pedestrian access.
- Construct a traffic circle at eastern approach to the new Frederick Douglass Memorial Bridge to connect South Capitol Street, Suitland Parkway, and Howard Road SE.
- Extend Anacostia Drive to the north gate entrance of the U.S. Naval Support Facility Anacostia. Construct an access road from Anacostia Drive to Howard Road and the traffic circle.
- Replace the existing Suitland Parkway/I-295 interchange with a two-lane loop ramp for I-295 SB at Suitland Parkway, and a new traffic signal at the merge point with Suitland Parkway.
- Reconstruct the I-295 bridge over South Capitol Street.
- Widen the I-295 bridge over Howard Road.
- Construct streetscape improvements along New Jersey Avenue.
- Widen the Martin Luther King, Jr. Avenue overpass at Suitland Parkway to accommodate a new multi-use trail.
- Construct a single-point center ramp interchange to create new access between Suitland Parkway and Martin Luther King, Jr. Avenue.
- Reconstruct pedestrian over-pass over Suitland Parkway between Sheridan Road and Barry Farms.
- Implement signed bicycle routes along New Jersey Avenue and throughout the Project Area to provide connections and improved access to the Anacostia Riverwalk Trail, the riverfront, and Historic Anacostia.
- Install unifying landscape features at the intersections of South Capitol Street and Potomac Avenue and South Capitol Street and Suitland Parkway to visually anchor the two ends of the new Frederick Douglass Memorial Bridge.

A more detailed description of the FEIS Preferred Alternative can be found in the FEIS.

1.3.2 Summary of the Revised Preferred Alternative

Following completion of the FEIS, design changes were made to the FEIS Preferred Alternative, resulting in the development of a Revised Preferred Alternative. The major elements of these design changes include:

- The alignment for the new Frederick Douglass Memorial Bridge was shifted parallel to and approximately 30 feet from the south side or downstream from the existing bridge superstructure. This bridge alignment would avoid the need to obtain right-of-way from Joint Base Anacostia-Bolling (JBAB). In addition, the bridge would have a fixed span, not a moveable span as proposed in the FEIS Preferred Alternative.
- The size of the traffic oval on the western approach to the new bridge was slightly reduced.
- At the eastern approach to the new bridge, a traffic oval, similar in size and shape to the West Oval, replaced the traffic circle. The East Oval will be located entirely within the existing DDOT right-of-way. Similar to the previously proposed traffic circle, the oval will still provide connections to the realigned South Capitol Street and Suitland Parkway. The initial configuration of Howard Road would connect directly with Suitland Parkway. The east oval would sever the existing access roads into the Poplar Point section of Anacostia Park. To maintain park access, the northeast leg of the east oval would be used for both the park's ingress and egress at Poplar Point.
- At the I-695/Suitland Parkway interchange, the grade of Ramp B (southbound I-295 to westbound Howard Road SE) was adjusted to be 6.5 percent from 9 percent, which would have been substandard for an interstate highway ramp.
- Replaced a portion of the I-295 Bridge over Firth Sterling Avenue SE and an inactive railroad right-of-way. The railroad would be replaced with earthen fill.
- At the Martin Luther King Jr. Avenue SE overpass at Suitland Parkway, the proposed ramps would be configured into an urban diamond interchange, instead of an interchange with center ramps.
- The eastbound I-695 ramp to southbound South Capitol Street was changed to an urban interchange ramp with South Capitol Street.

A more detailed description of the Revised Preferred Alternative is provided in the SDEIS.

2.0 Natural Resources

Potential impacts to natural resources would be expected to occur as a result of either Build Alternative were identified for construction and operation of the South Capitol Street project. Analysis of natural resources compares existing conditions to conditions expected to occur as a result of construction (FEIS Alternative and Revised Preferred Alternative). Natural resources analyzed include the following:

- surface water and ground water (including water quality)
- wetlands
- fish and wildlife (including habitat)
- federally threatened and endangered species
- floodplains
- geology, topography and soils

A list of District of Columbia and federally required permits and consultations necessary for completion of the South Capitol Street project are also provided as they relate to natural resources.

2.1 Water Quality

2.1.1 Surface Water Resources

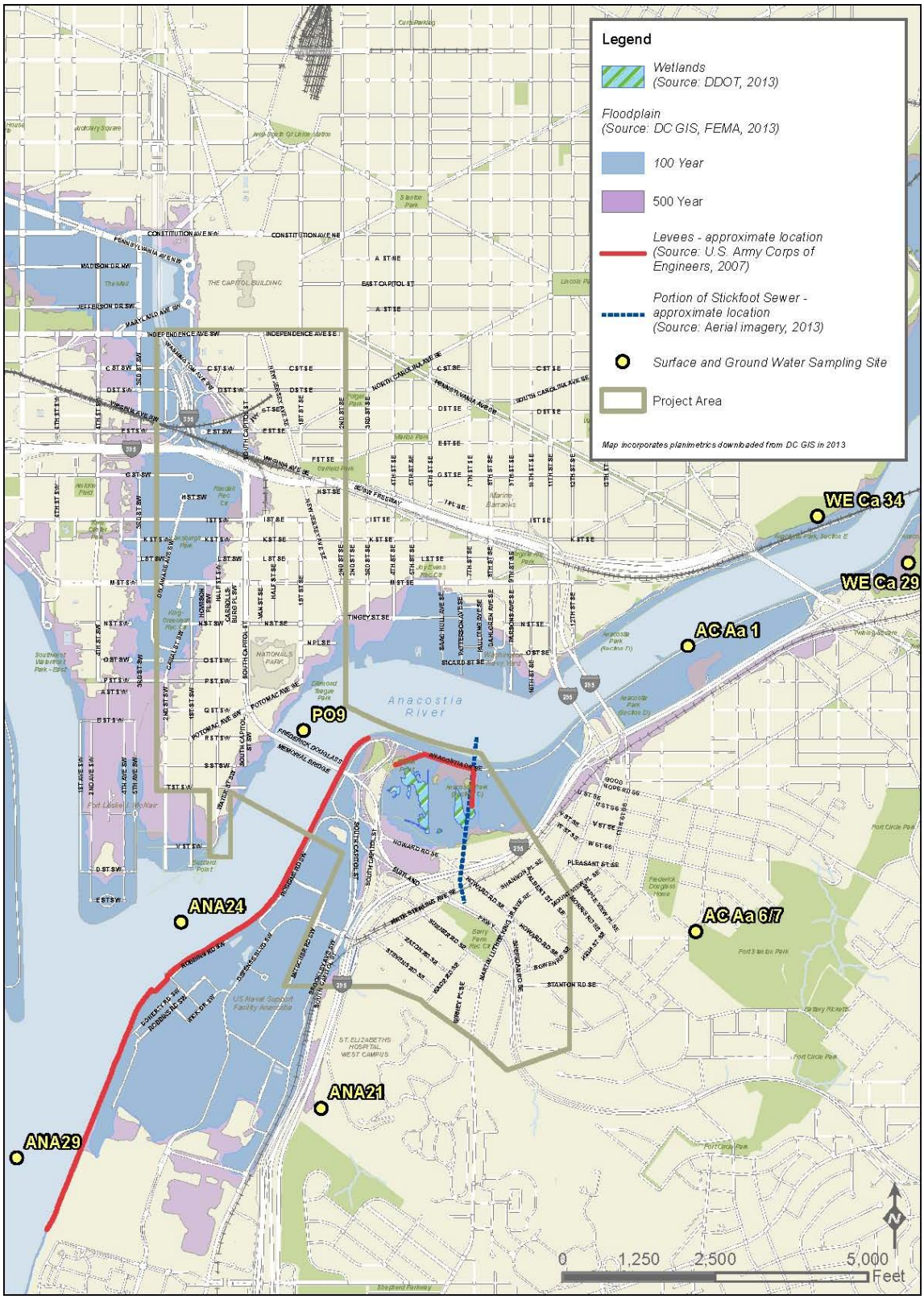
The federal Clean Water Act (CWA) establishes the structure for regulating discharges of pollutants into the Waters of the U.S. (WUS) and regulating water quality standards for surface waters. WUS include unvegetated ponds, seasonal pools, and perennial, intermittent, and ephemeral stream channels. WUS also includes wetlands, however, these are discussed separately in Section 2.2 of this report.

The boundaries of surface waters within the Project Area were identified on available existing mapping and in the field during the wetland delineation for the project. Detailed information on the results of the delineation is included within the wetland delineation section of this report. Surface water quality data were gathered from the U.S. Environmental Protection Agency (USEPA), Metropolitan Washington Council of Governments (MWCOG), District of Columbia Department of Environment (DDOE), National Oceanic and Atmospheric Administration (NOAA), Interstate Commission on the Potomac River Basin (ICPRB), U.S. Geological Survey (USGS), and other agencies.

The South Capitol Street Project Area is located entirely within the Anacostia River basin, a major tributary to the Potomac River. The Anacostia River watershed has a drainage area of 176 square miles, with Prince George's County comprising a majority of this area (49 percent), followed by Montgomery County (34 percent), and the District of Columbia (17 percent). The primary surface water resource in the Project Area is the lower Anacostia River, which is tidally influenced. The Anacostia River is classified as a navigable waterway by the U.S. Army Corps of Engineers (USACE). Other waterways identified within the Project Area during wetland delineations, conducted in 2005 and 2014, include a perennial tributary known as Stickfoot Branch (Figure 4). Historically, there were more small surface water resources draining to the Anacostia River within the Project Area, but these have been intercepted by storm drains and are no longer identified as surface waters. There are no national Wild and Scenic Rivers located within the Project Area.

Stickfoot Branch flows onto the southern end of the Project Area from a riprap channel on the west side of Suitland Parkway. The stream flows north into a reinforced concrete pipe under Suitland Parkway and is approximately five feet wide and one and a half feet deep at top of bank. During the time of the July 2014 fieldwork, this stream had an average water depth of one inch. From the culvert under Suitland Parkway, it appears that Stickfoot Branch eventually flows into a stormwater sewer pipe through Poplar Point and the Project Area. The Stickfoot Branch culvert through Poplar Point is over 72 inches in diameter and is considered in poor condition. The average pool depth is three feet. As part of the *Anacostia Waterfront Initiative Poplar Point Plan,* the Stickfoot Branch is being considered for daylighting by restoring the stream channel and exposing the stormwater to air, sunlight, soil, and other natural elements (DDOT 2003). Additionally, as part of the *Anacostia Waterfront Corporation Final Environmental Standards* (October 2012), one of the minimum standards to achieve its goal is to daylight streams including Stickfoot Branch.

Figure 4: Wetlands, Floodplains, and Surface Waters



2.1.1.1. Chemical Water Quality

Under the CWA, the USEPA has implemented pollution control programs and set water quality standards for all contaminants in surface waters. The CWA mandates that total maximum daily loads (TMDL) be established in order to bring existing water quality up to minimum established water quality standards in streams that have been categorized as "impaired." A TMDL is an estimate of the maximum amount of a pollutant that a given waterbody can absorb without violating environmental water quality standards (MDE 2011).

Historically, water quality in the tidal Anacostia River, as recorded in the Chesapeake Bay system (USEPA 1997), has been poor for both ecological and human health. High particulate loading is a major physical stressor, especially during storm events, which contribute to high turbidity and high rates of sedimentation (Syracuse Research Corporation and NOAA 2000). Biological stressors include fecal coliform pollution originating from combined sewer (sanitary and stormwater) overflows (CSO), which discharge sewage into the river during significant rainfall events.

Designated uses for all District waters are promulgated by the District of Columbia Municipal Regulations and the District of Columbia Water Quality Standards (WQS) (District of Columbia Law 5-188; District of Columbia Official Code § 8-103.01). The current uses of the Anacostia River include B, C, D, and E (Table 1). Primary contact recreation is not currently a designated use.

Table 1: Classification of Water and Designated Use of the Anacostia River as Defined by District of Columbia Water Quality Standards

Classification Code	Use Definition	Current use of the Anacostia River
A	Primary contact recreation	No
B	Secondary contact recreation and aesthetic enjoyment	Yes
C	Protection and propagation of fish, shellfish, and wildlife	Yes
D	Protection of human health related to consumption of fish and shellfish	Yes
E	Navigation	Yes

The lower Anacostia River from below the Pennsylvania Avenue Bridge to at the Potomac River was listed as an "Impaired Water" by USEPA in 2010 for Use Classes B and D, and considered a high priority for TMDL development for oil and grease and trash (MDE and DDOE 2010). Also in 2010, a joint TMDL was approved with the state of Maryland and the District of Columbia to limit the amount of trash in the Anacostia River. Three other TMDLs have been approved for the Anacostia River as a whole: organics and metals, biological oxygen demand, and total suspended solids (TSS).

In 2003, the District of Columbia established criteria within the WQS, as part of its Municipal Regulations for WUS and their designated uses. In 2013, these WQS were modified. Two important changes to these criteria from 2003 to 2013 were, 1) that fecal coliform or *Escherichia coli (E. coli*) no longer has a criterion for Classes B and C and 2) that dissolved oxygen criteria were adjusted to include both instantaneous minimum standards, as well as standards based on a seven or 30-day mean during different times of the year. These standards are detailed in Table 2. The District of Columbia does not

currently have numerical criteria for TSS, but a TMDL has been developed based on USEPA's interpretation of the District of Columbia's narrative criteria to protect aquatic life uses. This TMDL also considers water clarity and the requirements necessary for submerged aquatic vegetation growth and survival for each salinity regime. The TMDL requirement for TSS within the lower Anacostia River is less than or equal to 11.9 milligrams per liter (mg/l) during the growing season.

Table 2: District of Columbia Water Quality Standards for Designated Uses

Constituent	Criteria for Classes		
	A	B	C
Bacteriological (MPN/100 mL)			
E. coli[1]			
Geometric Mean (Maximum 30 day geometric mean for 5 samples)	126		
Single Sample Value	410		
Physical			
Dissolved Oxygen (mg/L)			
February 1 through May 31			
7-day mean			6.0
Instantaneous minimum			5.0
June 1 through January 31			
30-day mean			5.5
7-day mean			4.0
Instantaneous minimum			3.2
Temperature (^{o}C)			
Maximum			32.2
Maximum change above ambient			2.8
pH			
Greater than	6.0	6.0	6.0
And less than	8.5	8.5	8.5
Turbidity increase above ambient (NTU)	20	20	20
Secchi Depth (m)(seasonal segment average)			
April 1 through October 31			0.8
Total dissolved gases (maximum % saturation)			110
Hydrogen Sulfide (maximum μg/L)			2.0
Oil & grease (mg/L)			10.0
Biological			
Chlorophyll a (μg/L)(seasonal segment average)			
July 1 through September 30			25

Source: District of Columbia Municipal Regulations, 2013

There are a number of locations where water quality data have been collected by DDOE near the Project Area between 1999 and 2003. These stations, ANA-21, ANA-24, ANA-29, and PO9 are located in the Anacostia River and a tributary (Figure 4). These four stations were sampled for temperature, turbidity, dissolved oxygen, pH, fecal coliform, and TSS concentrations. Over this period, all of these parameters fell within the standard established for all of the designated uses set forth by the District of Columbia WQS

(ICPRB 1998, DDOE 2000). Between 2008 and 2012, water quality data were collected by the DDOE from PO9. Parameters measured were: temperature, turbidity, dissolved oxygen, pH, and chlorophyll a. Table 3 shows the percentage of readings that were out of compliance with WQS for each constituent measured from Station PO9 between 2008 and 2012. All water temperature and chlorophyll a values at the South Capitol monitoring station were in compliance with WQS. A majority of the pH values were in compliance with WQS, with less than one percent to three percent of the annual values not meeting WQS. Between 17 and 39 percent of the turbidity readings collected each year were out of compliance between 2008 and 2011; no turbidity data were available for 2012. Dissolved oxygen values were out of compliance periodically from 2008 to 2012. Seven-day dissolved oxygen averages did not meet WQS from eight to 57 percent of the time and instantaneous readings were out of compliance between two and 35 percent of the time. The 30-day minimum averages from June through January violated WQS from 29 to 71 percent of the time. While this portion of the Anacostia River no longer has an associated fecal coliform or *E. coli* standard, it did have an elevated average *E. coli* count (565MPN/100ml) from 2008 to 2011 (DDOE 2012).

Table 3: District of Columbia WQS for Designated Uses and the Percentage of Readings or Means Not Meeting WQS as Measured from Station PO9

Constituent	Standards for Criteria Classes B and C	2008	2009	2010	2011	2012
Dissolved oxygen (mg/L)						
February 1 - May 31						
7-day mean minimum	6	33%	57%	39%	8%	40%
Instantaneous minimum	5	20%	24%	18%	2%	19%
June 1 -January 31						
30-day mean minimum	5.5	29%	57%	38%	43%	71%
7-day mean minimum	4	21%	18%	15%	9%	44%
Instantaneous minimum	3.2	15%	17%	16%	35%	28%
Temperature (ºC)		met standards	met standards	met standards	met standards	met standards
Maximum	32.2					
Maximum change above ambient	2.8					
PH	6.0 - 8.5	<1%	<1%	3%	3%	3%
Turbidity (ambient (NTU))	≤ 20	17%	39%	31%	27%	no data available
Chlorophyll a (µg/L)(average July 1 through September 30)	<25	met standards	met standards	met standards	met standards	no data available

Sources: District of Columbia Municipal Regulations, 2013 and DDOE/District Rivers Monitoring Program (accessed 9/23/2013)

Data from the District of Columbia's 2001 and 2002 storm water monitoring stations suggest that the Anacostia River does not have significant oil and grease impairment. Samples taken from Stickfoot Branch exhibited no traces of oil and grease (DDOE 2003).

Between 1999 and 2003, the average TSS concentration for station ANA-21 was 21.75 milligrams per liter (mg/L), exceeding the District of Columbia standard. Additionally, both ANA-24 and ANA-29 fell just below the standard at 10.45 mg/L and 10.66 mg/L, respectively. Station ANA-21 also had slightly elevated turbidity concentrations (21.38 nephelometric turbidity units [NTU]), while concentrations at stations ANA-24 and ANA-29 fell within the standard. TSS concentrations have been linked to high turbidity levels, which adversely impact the designated uses of the Anacostia River (DDOE 2002). The primary sources of TSS loads come from stormwater runoff and from the Northeast and Northwest Branches of the Anacostia River, which drain a very large urbanized watershed.

The tidal Anacostia River has been shown to contain elevated levels of many toxic contaminants that include trace metals, organic compounds such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, and herbicides. PAHs are found in petroleum, coal, and other fossil fuels whose byproducts have a higher concentration of carcinogenic compounds. PCBs are used in electrical equipment including heat transfer systems, fluorescent lamp ballasts, television sets, and numerous other kinds of electrical appliances. Additionally, PCBs were used as plasticizers in paints, plastics, and rubber products and in pigments, dyes, carbonless copy paper, and in many other applications. These contaminants enter the river through non-point source loading, CSOs, erosion and sedimentation, and nutrient loading (Syracuse Research Corporation and NOAA 2000).

Many of these contaminants entering the Anacostia River settle into the lower estuarine portions of the river by way of its tributaries (i.e., Northwest Branch, Northeast Branch, Watts Branch, and Beaverdam Creek). A study conducted in 2003 involved the translocation of healthy Asiatic clams (*Corbicula fluminea*) from Potomac River sites to sites in the Anacostia River and its tributaries to locate watershed pollutant sources. The Potomac River site is located five kilometers (km) below the mouth of the Anacostia River estuary and serves as a reference site because of its ranking as the second best large-mouth bass fishing area in the United States (Phelps 2004). Organic compounds (PAHs and PCBs), pesticides, and six metals (cadmium, copper, chromium, iron, lead, and zinc) were biomonitored at four Anacostia estuary sites and 16 tributary sites. The total PAHs in clam tissues significantly exceeded the Potomac River reference at all Anacostia estuary sites and at a majority of the tributary sites. Total PCBs in translocated clam tissue significantly exceeded reference levels at all Anacostia River sites, as well as in the lower Northeast Branch and two sites in the lower Beaverdam Creek. Total pesticide accumulation in clam tissue significantly exceeded the reference in three tributaries, including a large percentage of chlordane in the Watts Branch and Northeast Branch tributaries. The Northeast Branch contributes approximately 45 percent of Anacostia River tributary flow (Phelps 2004). In 2008 and 2009, these same methods were used to evaluate toxic metals, PCBs, and PAHs at the outlet of Stickfoot Branch. At this site, metals did not exceed reference, but PAHs exceeded reference concentrations and were two times the average of all the Anacostia tidal sites (Phelps 2010). High chlordane was also detected in clams from the Stickfoot Branch site in 2008 and 2009.

In another study in the lower Anacostia River, liver and skin tumor prevalence in brown bullheads (*Ameiurus nebulosus*) was assessed to evaluate PAH concentrations in the sediment (Pinkney et al. 2004). Polynuclear aromatic hydrocarbons cause liver tumors in bottom-dwelling fish species. Tumor prevalence was assessed in two, five-year cycles (1996 to 2001 and 2009 to 2011). A statistically significant decrease in tumor prevalence was observed in the second monitoring cycle, suggesting that PAHs in Anacostia sediment have declined.

The District of Columbia WQS for trace metal and organics for the C and D Designated Uses of the lower Anacostia River are listed in Table 4. These concentrations are measured as either chronic or acute. A chronic concentration is the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (four day average), while an acute concentration is the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (one-hour average).

Table 4: District of Columbia WQS for Trace Metals and Inorganics

Constituent	Designated Use C		Designated Use D
	[1]CCC (Four day average)	[2]CMC (One hour average)	(30 day average)
Antimony, dissolved (mg/L)	-	-	4.3
Arsenic, dissolved (mg/L)	0.15	0.34	0.00014
Cadmium, dissolved (µg/L)	0.10 – 0.84	0.11 – 4.69	-
Chlorine, total residual (mg/L)	0.011	0.019	-
Chromium, trivalent, dissolved (µg/L)	57.19 – 554.01	176.31 – 1707.85	-
Copper, dissolved (µg/L)	3.47 – 37.10	4.61 – 62.82	-
Cyanide, free (mg/L)	0.0052	0.022	220.0
Iron, dissolved (mg/L)	1.0	-	-
Lead, dissolved (µg/L)	0.25 – 16.22	6.55 - 416.26	-
Mercury, total recoverable (mg/L)	0.000012	0.0024	0.00015
Nickel, dissolved (µg/L)	48.65 – 507.89	438.06 – 4573.23	4600
Selenium, total recoverable (mg/L)	0.005	0.02	-
Silver, dissolved (µg/L)	-	0.31 – 37.44	65000
Thallium, dissolved (mg/L)	-	-	0.0063
Zinc, dissolved (µg/L)	32.28 – 338.27	35.36 – 370.45	-

[1] CCC- Criteria Continuous Concentration
[2] CMC- Criteria Maximum Concentration
Source: District of Columbia Municipal Regulations, 2003

Samples from water quality monitoring stations within the Anacostia River (ANA-12, ANA-17, and ANA-21) were tested for the constituents listed in Table 4, except for chlorine, cyanide, and iron. Average concentrations for antimony from all of the stations fell within the District of Columbia's standard, while all other concentrations sampled from the stations far exceeded the standard.

Surface sediment samples taken from the top six inches of the channel bed throughout the tidal Anacostia River were analyzed for USEPA's list of priority pollutants. Concentrations for over 60 chemicals were on the list, with the greatest frequencies of those exceeding WQS occurring within the pesticide, PCB, and metal classes of chemicals. The highest contaminant levels and the greatest number of detected priority pollutants were found between the Benning Road Bridge and the Frederick Douglass Memorial Bridge (Syracuse Research Corporation and NOAA 2000).

2.1.2 Groundwater

Drinking water is supplied by the District of Columbia's Water and Sewer Authority (WASA), which purchases water from the Potomac River through the Washington Aqueduct Division of the USACE. The District of Columbia does not use groundwater as a potable water source, but still maintains regulations for the different use classes that relate to surface water recharge, drinking water in other jurisdictions, and potential future use as a raw drinking water source in the District of Columbia. All groundwater in the District of Columbia is classified as Class G1, which is considered the most restrictive use

class, until enough information is provided to warrant a different classification. Class G1 is defined as groundwater that is highly vulnerable to contamination within recharge areas of drinking water aquifers of adjacent jurisdictions, hydrologically connected to surface waters within the District of Columbia, and discharges to a sensitive ecological system that supports a unique habitat (District of Columbia Municipal Regulations 1994).

Available data from USGS, Maryland Geological Survey (MGS), DDOE, and USEPA published resources were used in determining the availability and quality of groundwater within the South Capitol Street Project Area. The Project Area is underlain by the Northern Atlantic Coastal Plain aquifer, which is composed of semi-consolidated sand aquifers of the regional Potomac Group aquifers (USGS 1984). Locally, the Patuxent and Patapsco aquifers of the Potomac Group are the only aquifers used for water supply in the District of Columbia. These sand and gravel aquifers are interlayered with silt and clay confining beds that create artesian systems, systems in which the water-bearing zone is overlain by a relatively impermeable layer.

A total of 340 million gallons per day (Mgal/d) of both surface and groundwater withdrawals are used within the District of Columbia. Approximately one Mgal/d of groundwater from the Potomac Group aquifers is used for industrial and municipal purposes (USGS 1984). Construction activities that use sump pumps for groundwater control and dewatering are the largest users of groundwater (DDOE 1992). The ability of groundwater to recharge in downtown Washington is documented as very poor and decreasing due to the impervious surfaces, sump pumps, and dewatering activities necessary to maintain subsurface transit and various other building maintenance and operations (UDC 1992).

Groundwater wells installed within the Potomac Group aquifers commonly range from 30 to 1,250 feet below the ground surface. According to well data from USGS, the median depth of groundwater observed in wells in the District of Columbia was 15 feet below the ground surface. Data from wells near the Project Area have a median depth of groundwater at 8.5 feet below the ground surface (Table 5).

Table 5: Wells Screened in the Potomac Group Aquifers of the District of Columbia Between 2002 and 2013*

Well Name	Latitude (Decimal)	Longitude (Decimal)	Well Depth (feet)	Average Water Level Below Ground Surface (feet)
AC Aa 1	38.87361111	-76.98361111	30	2.3
AC Aa 2	38.865944	-76.967583	17	8.4
WE Ca 29	38.87733333	-76.97091667	48.5	8.5
WE Cb 8	38.88119444	-76.95777778	265	38.3
WE Ca 34	38.879333	-76.976417	33	12.6

Source: (USGS 2005)
*Wells were not all monitored in all years

Average annual precipitation in the District of Columbia is approximately 43 inches, with about one-fourth to one-third of this precipitation reaching the water table (USGS 1984). The water table varies across the Project Area based on seasonality and local pre- and post-construction activity. The groundwater used for industrial and construction purposes is rarely directed into aquifers once it has been used, as most of this water is pumped into

storm and sanitary systems at the end of each day (DDOE 1992). Groundwater discharge occurs by upward leakage to shallower aquifers (USGS 2005). Water level measurements in the fill areas of Poplar Point are controlled by the topography of confining clay layers and by localized areas of recharge (Ridolfi 2003). Erratic water level patterns observed in monitoring wells within Poplar Point also suggest that there is no consistent direction of groundwater flow in the fill areas. Some of the monitoring well and cross section data in Poplar Point imply that the lower permeable unit of fill may be hydraulically connected to the Anacostia River and experiencing tidal fluctuation.

The quality of groundwater within the Potomac Group aquifers is generally high in iron, often exceeding the USEPA drinking water standard of 0.3 mg/L. The median concentration of dissolved solids is considerably lower than the drinking water standard. The groundwater is considered “soft” in these aquifers, with a median hardness of 14 mg/L. Chloride concentrations (10 mg/L) and nitrate (10 mg/L) plus nitrite (as nitrogen) fall below the USEPA standard (USGS 1987). However, elevated concentrations of chloride or nitrate plus nitrite were not detected at groundwater wells in the vicinity of the South Capitol Street Bridge.

Existing and potential sources of groundwater contamination include sources such as landfills, underground storage tanks, septic tank systems, landfills or open dumps, and military facilities. Groundwater contamination from septic system failure is usually localized around communities with numerous failing systems. Groundwater samples from wells installed within the Project Area were sampled for inorganic concentrations, volatile organic compounds, and petroleum hydrocarbons. Concentrations associated with these parameters were compared to existing screening levels that include USEPA Safe Drinking Water Act Maximum Contaminant Level (MCL), District of Columbia Groundwater Criteria, District of Columbia Risk-Based Screening Levels (RBLs) for Residential and Industrial Groundwater, District of Columbia Clean Up Standards for Hydrocarbon-Contaminated Groundwater, and USEPA’s III Risk-Based Concentrations (RBCs) for Tap Water (Ridolfi 2003).

Groundwater sampling in the Project Area identified several inorganic contaminants at levels exceeding the maximum contaminant levels for USEPA or DC standards: arsenic, iron, and manganese (Table 6). Arsenic was detected at concentrations above the USEPA RBC for tap water during all sampling events and was detected above the USEPA MCL on two occasions. Manganese and iron were consistently detected at concentrations above the District of Columbia’s Groundwater Criterion (Table 6). While benzene and petroleum hydrocarbons (diesel and gasoline) were found in levels that violated the USEPA and DC standards in 2002, neither was detected at elevated levels after this time (Ridolfi 2003).

A study was performed by the USGS and DDOE to determine pesticide concentrations in groundwater in the Anacostia River watershed (Koterba et al. 2010). Several groundwater wells throughout the watershed were monitored for pesticides, major ions, and nutrients in 2005 and 2008. No pesticides were found in the wells in close proximity to the Project Area, but were found in several other wells in the Anacostia River watershed. The authors of the study attribute the absence of pesticides in wells within the Project Area to their locations in large parks or open spaces, as opposed to the sites with pesticides that were in close proximity to developed areas.

Buzzards Point, located on the southeast side of the intersection of Potomac Avenue and the Frederic Douglass Memorial Bridge, has been cited to have groundwater contamination from Total Petroleum Hydrocarbons, Benzene/Tolunene/Ethylbenzene/Xylenes (BTEX), and naphthalene above DDOE action levels (EEE 2008). This site was previously owned by Amerada Hess Corporation and contained several petroleum underground storage tanks and aboveground storage tanks, some of which have been removed.

Table 6: Groundwater Results for Measured Parameters that Exceed Groundwater Screening Levels and US and DC Standards

Parameter Group		**Total Inorganics (mg/L)**		
Analyte		**Arsenic**	**Manganese**	**Iron**
USEPA Safe Drinking Water Act MCL		0.01	N/A	N/A
District of Columbia Groundwater Criteria Class		0.05	0.05	0.3
USEPA Region III RBC for Tap Water		0.000045	2.6	NA
District of Columbia Cleanup Standard for Hydrocarbon Contaminated Groundwater		-	-	-
Sample Date	**Station ID**			
9/15/2010	WE Cb 8	**0.00019**	**0.189**	**4.6**
9/7/2010	WE Ca 29	**0.0014**	**0.150**	**7.4**
9/8/2010	WE Ca 34	**0.00092**	**1.26**	**7.5**
9/4/2008	WE Cb 8	**-**	**1.59**	**3.5**
8/27/2008	WE Ca 34	-	**0.58**	**3.1**
Aug-Sept 2008	AC Aa 7	-	**0.57**	**4.2**
Aug-Sept 2008	AC Aa 6	-	**1.58**	**-**
12/20/2005	WE Cb 8	**0.00011**	**0.189**	**3.1**
9/27/2005	WE Ca 34	**0.021**	**0.64**	**7.9**
9/21/2005	AC Aa 1	**0.0399**	**0.0631**	**22.5**
9/19/2005	WE Ca 29	**0.0031**	**0.141**	**23.9**

Source: (Ridolfi 2003, Koterba et al. 2010)

2.1.3 Environmental Consequences

2.1.3.1. Surface Water Resources

Section 404 of the CWA provides regulatory authority and is administered by the USACE for issuance of permits for discharge of dredged or fill material into WUS. The USACE also issues permits for alterations in or over navigable waters such as the Anacostia River, under Section 10 of the Rivers and Harbors Act. Similarly, compliance with Section 401 of the CWA is also required for any impacts to the Anacostia River or other impacted streams or wetlands. Administered by the Water Quality Division of the District of Columbia DDOE, the Section 401 certification acknowledges the USACE issuance of the 404 permit and allows for the District of Columbia to add specific conditions to assure all the District of Columbia's water quality standards are met. Section 9 of the Rivers and Harbors Act is administered by the U.S. Coast Guard (USCG). This permit is required for construction of a new bridge over a navigable waterway.

As previously discussed, surface water resources within the Project Area are limited to two stream resources: the Anacostia River, andStickfoot Branch, including an above ground section just west of Suitland Parkway and the portion that drains in a culvert through Poplar Point to the Anacostia River. Potential impacts to surface waters from either of the Build Alternatives could include effects to physical aspects of Project Area streams as well as water quality impacts from runoff during construction and/or operation of the new bridge. Most impacts from the Project relate to temporary effects from construction and demolition activities, although permanent impacts from new bridge piers are anticipated within the Anacostia River.

FEIS Preferred Alternative

The FEIS Preferred Alternative involves the construction of a new Frederick Douglass Memorial Bridge over the Anacostia River and demolition of the existing bridge. The proposed design is an arched bascule, movable bridge, including two main piers in the river and one end pier half in and half out of the river. The end pier on the east side has ample clearance from the existing seawall and coincides with the existing levee. The interim navigation channel during construction is maximized through the east channel of the existing bridge. The impact to the riverbed is approximately 11,884 square feet. Pilings used to support the piers are generally seven feet in diameter, with an average depth of 18 feet. The seven piers supporting the existing bridge would be removed to a depth approximately 2 to 5 feet below the stream bed and the voids would be backfilled with suitable material.

Revised Preferred Alternative

The Revised Preferred Alternative involves construction of a new fixed span bridge parallel to and just south of the existing bridge. The new bridge will span the existing levee along the eastern shore of the Anacostia River. Impacts to the Anacostia River from the Revised Preferred Alternative would be associated with the construction of the new bridge and demolition of the existing bridge. Four in-stream piers will support the bridge structure, while two piers are proposed within the floodplain on either side of the Anacostia River. The impact to the riverbed is anticipated to be approximately 20,368 square feet. Pilings used to support the piers are similar in size to those proposed for the FEIS bridge piers.

2.1.3.2. Chemical Water Quality

Impacts to chemical water quality resulting from either of the Build Alternatives could include accidental spills or sediment releases during construction as well as increased or altered stormwater runoff characteristics during long-term operation of the bridge and approach roadways. However, surface water quality impacts are expected to be minimal from both Build Alternatives as designs incorporate stringent sediment and erosion control during construction, and stormwater treatments minimize permanent impacts from the impervious surfaces of the completed bridge and approaches. The treatments are designed to intercept pollutants from roadway runoff and prevent delivery to both the Anacostia River and groundwater entry points. The South Capitol Street Project provides an opportunity to meet and exceed regulatory requirements for stormwater runoff and further reduce pollutants entering the Anacostia River by use of appropriate and effective Best Management Practices (BMPs). Existing pavement scheduled for demolition outside the proposed roadway but inside the right-of-way is considered an opportunity for BMP

placement (DDOE 2013). Stormwater control systems for public space regulated by DDOT are mandated to utilize Low Impact Development (LID) technologies in the *Anacostia Waterfront Transportation Architecture Design Standards* (DDOT 2007b), or other measures approved by the Anacostia Waterfront Corporation (AWC) and DDOT. Since the project lies in the Anacostia Waterfront Development Zone, it will need to have additional stormwater management beyond those designated by the District and federal governments.

FEIS Preferred Alternative

The FEIS Preferred Alternative would decrease the impervious surface area from 76.0 acres to 74.5 acres. This would result in less stormwater runoff entering the Anacostia River. The FEIS Preferred Alternative would require that all stormwater entering storm sewers be treated to filter out debris and other pollutants before discharge into the Anacostia River. Because of the decrease in impervious surface area as a result of this alternative, stormwater from a 15-year storm event does not require retention before discharge into the Anacostia River (DDOT 2007b).

Stormwater treatment concepts examined for the FEIS Preferred Alternative are referenced in Section 3.1, Stormwater Filtering Systems, of the District of Columbia's *Stormwater Management Guidebook*. Seven treatment designs were identified and analyzed for the South Capitol Street Project. Inlet designs for the proposed treatments were based on sizing criteria for average rain events, 15-year storm events, and an extended detention basin. Types of treatments investigated include underground sand filters, bioretention filter boxes, catch basin inserts, two types of underground vaults, and combined sewer overflow systems. Specific stormwater treatments would be determined during final design.

Revised Preferred Alternative

The Revised Preferred Alternative would increase the impervious surface area from 67.3 to 68.0 acres. A variety of stormwater BMPs to meet pollution removal goals and reduce peak stormwater discharges from the Revised Preferred Alternative are presented in the *South Capitol Street Phase 1 Project/Task Order 6 Preliminary Stormwater Management Plan* (DDOT 2013). Phase 1 of this Project includes Segments 1 (Frederick Douglass Memorial Bridge and approaches) and 2 (I-295/Suitland Parkway interchange reconstruction).

Several structures will be constructed to capture, direct, and treat Project related and non-Project related stormwater, including catch basins, roadside ditches, and several types of BMPs. New catch basins are proposed along the Project roadways that will meet or exceed local and District of Columbia standards. All catch basins will connect with existing or proposed District of Columbia Water (DCW) storm sewer trunk lines via DCW manholes. Existing roadside ditches may be impacted by the construction of the new roadway. New roadside ditches will be constructed to direct offsite runoff to existing stormwater sewer systems. The three types of BMPs that are proposed for the Project are enhanced bioretention, dry swales, and permeable pavers. Also, buffer zones between the curb and the proposed sidewalk will be implemented upstream of each catch basin wherever possible so runoff will be captured and infiltrated before it is discharged into the catch basin. The Design-Builder is required to submit a Stormwater Management

Plan at key milestones. These plans will have more finalized stormwater management design depending on the final design of the roadway and bridge.

2.1.3.3. Groundwater

The impacts affecting Project Area surface waters directly relate to groundwater impacts as well. Groundwater impacts are generally described as alterations in quality and quantity. Impacts to groundwater quality relate to an increase in concentrations of undesirable or harmful substances introduced into groundwater. Impacts to groundwater quantity are associated with the reduction of groundwater. Groundwater is hydrologically connected to the Anacostia River in the vicinity of the Frederick Douglass Memorial Bridge and on the east side of the river where there are less impervious surfaces. The Anacostia River represents one of two major surface water bodies in the District of Columbia, and interactions between the river and groundwater are both induced and natural (University of District of Columbia [UDC] 1992). The induced interaction is through subsurface conduits, such as Stickfoot Branch and other underground drainage facilities.

The Build Alternatives are expected to have negligible effects on groundwater quality and quantity. Stormwater management designs for either Build Alternative will be implemented to prevent negative impacts to groundwater quality by intercepting pollutants from the roadway prior to their delivery to the Anacostia River or conveyance to a drainage swale. The stormwater BMPs are also designed to prevent impacts to groundwater quantity by utilizing more permeable design techniques, like permeable pavers, and by retaining runoff in catch basins that will potentially recharge into the groundwater after treatment.

2.1.4 Mitigation

Construction of either Build Alternative would be in accordance with all applicable state and federal regulations. Construction of the new Frederick Douglass Memorial Bridge, with either Build Alternative, will likely be permitted by a 404 Nationwide Permit (NWP) Number 15. The USACE and the DDOE typically require mitigation for waterway impacts on a project-specific basis. The agencies target compensatory stream mitigation projects to replace stream functions when feasible. In addition to stream channel improvements, mitigation measures for waterway impacts consider the size, stream order, and location of the stream to determine appropriate stream mitigation. Coordination will continue throughout the project, and all impacts will be mitigated in accordance with District of Columbia and federal regulations.

BMPs and currently acceptable design and construction procedures would be used to reduce or eliminate anticipated undesirable effects resulting from construction. Demolition of the old Frederick Douglass Memorial Bridge will likely be accomplished using non-blasting techniques to avoid impacts to the Anacostia River. Dredging is not currently proposed for construction or demolition for this project. Additionally, impact reduction techniques such as scare charges, physical barriers (e.g., cofferdams), and bubble curtains will be used to mitigate potential impacts to fish and other aquatic life from underwater blasting or pile driving, if they were to occur during construction of this project. Turbidity curtains may also be used around pier construction to provide a physical barrier around pile driving activities to contain suspended solids from leaving the construction site.

Erosion control and stormwater management is required during construction through the National Pollutant Discharge Elimination System (NPDES) permitting program. Adherence to District of Columbia and federal design criteria for the construction of roadways and bridges would eliminate the potential for long-term soil erosion due to the project.

Construction in contaminated areas would be subject to regulatory requirements of the DDOE. Dewatering activities near contaminated zones may result in the collection and discharge of contaminated groundwater. Where this occurs, treatment of the dewatering effluent may be necessary before discharge. In most cases, the contamination would likely consist of petroleum hydrocarbons, and treatment with an oil/water separator and carbon filtration system would reduce the petroleum concentrations sufficiently for discharge to the stormwater system. Dewatering treatment would be performed under a DDOE permit for the discharge of treated groundwater from oil-contaminated groundwater sources.

2.2 Wetlands

Wetlands are jointly defined by the USEPA, the USACE, and the District of Columbia as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions” (USEPA, 40 CFR 230.3, and USACE, 33 CFR 328.3, DC Law 5-188; D.C. Official Code §§ 8-103.04 and 8-103.20). In 2005, wetland areas were initially located using U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, the USGS maps for the Anacostia and Alexandria Quadrangles, and the US Department of Agriculture (USDA) *Soil Conservation Service Soil Survey of District of Columbia* (1976). The Project Area was subsequently delineated in 2005 and the results were included in the *South Capitol Street Natural Resources Technical Report* published in 2007 (DDOT 2007a). A new wetland delineation was performed in May and July2014 within portions of the Project Area that lie within the current limits of disturbance (LOD) for the Revised Preferred Alternative to verify originally delineated wetlands or any new wetlands not previously delineated.

Wetlands were identified in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region, Version 2.0* (USACE 2010). This approach is based on three parameters including hydrology, hydric soils, and hydrophytic vegetation. Soil color was identified using *Munsell Soil Color*

Charts (Munsell 1975). Hydric soil indicators were assessed using the *Field Indicators of Hydric Soils in the United States* (USDA 2010). The wetland indicator status of the observed vegetation was identified using the *National Wetland Plant List* (NWPL), *Version 2.0* (Lichvar 2012). The 2012 NWPL serves as an update to the previously used 1988 List; the reasons for the update and a thorough technical description of the various changes are detailed in *Concepts and Procedures for Updating the National Wetland Plant List* (USACE 2008). Wetland functions and values were evaluated in the field using best professional judgment. Wetland boundaries were marked in the field using pink wetland delineation survey ribbon and surveyed using a handheld Trimble global positioning system (GPS) unit.

A total of six wetlands were identified within the Project Area during the 2005 wetland delineation. The wetland cover types included four that were palustrine emergent (PEM); one that was palustrine forested (PFO); and one that was a combination of PFO, PEM, and palustrine scrub shrub (PSS). All of the wetlands were located within Anacostia Park on Poplar Point. Four of the wetlands were isolated and determined to be non-jurisdictional due to their lack of hydrologic connectivity to other streams and wetlands. Two wetlands were considered jurisdictional, as they drained through pipes to the Anacostia River. A copy of the original *Wetland Delineation Report* completed in 2005 can be found in the *South Capitol Street Natural Resources Technical Report* (DDOT 2007a).

Three additional wetlands were identified within the Project Area during the 2014 wetland delineation. One area, originally designated as a surface water (listed as “unnamed tributary”) in 2005, was changed to a PFO wetland (Figure 5). This 0.04-acre PFO wetland consists of a narrow drainage swale located between I-295 and Golden Raintree Drive, just south of Firth Sterling Avenue SE. The swale receives hydrology primarily from surface water, including drainage from I-295 and Golden Raintree Drive. Other hydrologic indicators observed included a high water table, sediment deposits, drainage patterns, and the presence of reduced iron. Wetland vegetation was dominated by hydrophytic plants, including green ash (*Fraxinus pennsylvanica*) and ash-leaf maple (*Acer negundo*). Soils were significantly disturbed due to the recent construction of the adjacent National Coast Guard facility, and consisted mostly of deposited sand and silt. However, a depleted matrix (Indicator F3) was observed under the deposition, indicating that hydric soils are present. The presence of reducing conditions was also confirmed using the alpha alpha-dipyridyl test, which also supports the presence of hydric soils.

Two additional wetland areas and one stream were also delineated between Dunbar Road and Suitland Parkway. Both wetlands lie adjacent to the above ground section of Stickfoot Branch discussed in Section 2.1.3.1.

The northern area consists of a 0.07-acre PEM wetland swale that originates from a reinforced concrete pipe under Dunbar Road. Wetland hydrology in this swale includes surface water from stormwater runoff and groundwater input from the adjacent hillslope. Hydrology indicators observed during the fieldwork include surface water, a high water table, saturation, sediment deposits, and drainage patterns. Wetland vegetation was dominated by rice cutgrass (*Leersia oryzoides*) and broadleaf cattail (*Typha latifolia*). Hydric soil indicators consisted of a depleted matrix (Indicator F3), which was observed in the upper 12 inches of the soil surface.

The southern area consists of a 0.08-acre PEM wetland swale near the southern boundary of the project area. Both soil and hydrology in this area appear to be significantly disturbed due to the recent construction of a Washington Metropolitan Area Transit Authority maintenance access area and adjacent water line. The hydrology in the wetland appears to originate from a broken water line, causing water to flow across the easement and downslope to Suitland Parkway. Due to recent grading and placement of rip-rap in the swale, the soils in this wetland are significantly disturbed. However, one centimeter of muck (Indicator A9) and the presence of reduced iron were observed, indicating that hydric soils are present in this wetland. Hydrophytic vegetation consisted of common fox sedge (*Carex vulpinoidea*), lamp rush (*Juncus effusus*), unknown goldenrod (*Solidago* sp.), and narrow-leaf cattail (*T. angustifolia*), Japanese honeysuckle (*Lonicera japonica*), and porcelainberry (*Ampelopsis brevipedunculata*).

Completed Routine Wetland Delineation Data Forms for the additional areas delineated in 2014 are included in **Appendix A**.

In April 2005, representatives from the USACE, NPS, DDOE, and DDOT conducted field verifications of the wetlands and waterways identified and their boundaries. A letter from the USACE, dated July 1, 2005, provided an official "Jurisdictional Determination" of all wetlands and waterways regulated by the USACE.

Agency correspondence is located in the *South Capitol Street Natural Resources Technical Report* (DDOT 2007a). An additional Jurisdictional Determination will be completed with the USACE and DDOE for the wetlands identified during the 2014 delineation.

2.2.1 Environmental Consequences

All transportation projects affecting wetlands are required to maintain the natural functions of wetlands, or provide appropriate mitigation or compensation. Where impacts are unavoidable, impacts must be minimized to the extent practicable and an evaluation of alternatives that have been considered to avoid or minimize the impacts must be prepared. Avoidance of wetland impacts is the preferred approach recommended by resource and regulatory agencies. A total of nine wetlands were identified within the Project Area. Most wetlands were located in the southeastern portion of the Project Area within Anacostia Park on Poplar Point and west of Suitland Parkway. The only other wetland was located adjacent to I-295 in the southern portion of the Project Area.

Figure 5: Delineated Wetlands and Streams within the Project Area

2.2.1.1. FEIS Preferred Alternative

All wetlands are located outside of the Project LOD for the FEIS Preferred Alternative. Construction of the FEIS Preferred Alternative would not impact wetlands within the Project Area.

2.2.1.2. Revised Preferred Alternative

Of the nine delineated wetlands, six are located are located outside of the Revised Preferred Alternative LOD, and would not be impacted by the Project. Although the two newly delineated wetlands along Suitland Parkway are present within the Project Area, the limits of disturbance were drawn using entire parcel boundaries to give the Design-Build team sufficient area to accommodate access and staging for the project. However, only portions of the parcels will be disturbed and the wetlands will be fenced off for protection so they are not impacted.

In addition, the newly identified wetland adjacent to I-295 currently falls within the Revised Preferred Alternative LOD, and would result in a permanent impact of 0.04 acre of PFO wetland. The current design includes replacement of the I-295 Bridge over Firth Sterling Avenue SE and the adjacent abandoned railroad right-of-way, which will be replaced by earthen fill. This work could result in at least a partial filling of this wetland. If the impact were to occur, it would be addressed in the same permit with the bridge, likely qualifying under USACE Nationwide Permit 14 for linear projects. Impact avoidance and minimization efforts will be explored during the further design of the project, and a final wetland impact assessment will be conducted at that time.

2.2.1.3. Mitigation

No wetland impacts were anticipated from completion of the FEIS Preferred Alternative. The LOD as currently depicted for the Revised Preferred Alternative would result in an impact of 0.04 acre of PFO wetland. As noted above, this impact may be avoided during the design of the project. If not, any required mitigation will be addressed at that time. Wildlife and Habitats

2.2.2 Aquatic Ecology

2.2.2.1. Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) is defined as vascular plants that remain below the water surface during the growing season. The distribution, abundance, and species composition of submerged aquatic vegetation depends on several variables including salinity, water quality, water temperature, and water depth. Submerged aquatic vegetation provides important ecological functions, including the following:

- generating food and habitat for waterfowl, fish, shellfish, and invertebrates
- adding oxygen to the water column during photosynthesis
- filtering and retaining sediments
- absorbing excess nutrients (which they require for growth), such as nitrogen and phosphorus that may cause the growth of unwanted algae in surrounding waters

Activities affecting the removal or eradication of submerged aquatic vegetation are regulated by the USACE pursuant to Section 404 of the CWA, as amended, and Section 10 of the Rivers and Harbors Act of 1899. These areas are also regulated by the District of Columbia as promulgated under the Water Pollution Control Act of 1984 (D.C. Law 5-188, D.C. Code §6-923).

The Virginia Institute of Marine Sciences (VIMS), in coordination with the National Oceanic and Atmospheric Administration (NOAA), Virginia Department of Environmental Quality (VADEQ), Maryland Department of Natural Resources (MDNR), and the Virginia Coastal Zone Management Program (VCZMP), documents the presence of SAV within the Chesapeake Bay Watershed on a yearly basis (mid-1990s to present). Aerial photography is used to document SAV bed locations, size, and species present. These data are then used to develop trends, identify areas of decline and abundance, and implement preservation strategies. Historical SAV mapping, from 1994 to present, was reviewed to determine the extent of SAV beds within the Anacostia River and immediate vicinity of the Frederick Douglass Memorial Bridge. According to results presented by VIMS on their SAV web site (http://www.vims.edu/bio/sav), no SAV beds were observed within the tidal portion of the Anacostia River.

The Fisheries and Wildlife Division of the DDOE conducts an annual shoreline survey to monitor the extent and health of SAV populations through the Potomac and Anacostia River. Surveys are conducted from a slow moving boat driven along the shorelines, and SAV are documented by visual observation and rake sampling. All of the shoreline areas of the Anacostia River that are contained within the District of Columbia were surveyed for SAV. The results of this effort indicated that no SAV was observed in the Anacostia River in 2012 (DDOE 2012). DDOE reports that no observable SAV has been present in the Anacostia River since 2002 (Daniel Ryan personal communication August 27, 2013).

2.2.2.2. Benthic Macroinvertebrates

Benthic macroinvertebrates are small organisms that lack backbones living on, or in, the bottom sediments of streams and rivers. Benthic macroinvertebrates include crayfish, clams, snails, aquatic worms, and the immature forms of aquatic insects, such as stonefly and mayfly nymphs. Macroinvertebrate communities are indicators of localized water quality conditions, because many have limited migration patterns and include species that have a broad range of pollution tolerances. Site-specific impacts and cumulative effects on surface water quality can be assessed through the changes in composition and structure of the macroinvertebrate community. Due to the poor water quality conditions of the lower Anacostia River, benthic life is severely diminished. The clams and mussels found within the nearby Potomac River are missing in the Anacostia River due to sediment toxicity and contaminants transported in from the Anacostia tributaries (USEPA 1997).

Limited existing benthic macroinvertebrate sampling data were obtained from the USEPA and private research companies. Six sampling stations within the lower Anacostia River were used in 1988 to characterize the biological integrity of tidal systems in the District of Columbia. The benthic macroinvertebrate communities in the Anacostia River were categorized as severely degraded and rated as poor using the Hilsenhoff Biotic Index (HBI). The index evaluates pollution tolerance, as it relates to organic pollution, and increases with degradation. The samples were dominated by pollution-tolerant organisms

that include oligochaetes (worms) and chironomid larvae (e.g., midge, gnat) (USEPA 1997).

Sampling of benthic macroinvertebrates occurred in June 2003 north of the Frederick Douglass Memorial Bridge along the western bank, approximately between the US Capitol Pump House (near 1st Street SE) and the Washington Navy Yard (near 2nd Street SE) (Reible et al. 2003). The benthic community data were evaluated using the Shannon-Wiener diversity index. The Shannon-Wiener diversity index, which ranges from 0 to 4, reflects the diversity or complexity of a community, with an index of 4 representing a high community complexity. All of the samples had an average score of 2.4 for the Shannon-Wiener diversity index, representing a lower quality community complex (Reible et al. 2003). This study was repeated in 2005 (Reible et al. 2006). Benthic macroinvertebrate composition was similar between years, but other measures of community health described a more degraded condition in 2005. The number of taxonomic groups, mean benthic macroinvertebrate density, and average Shannon-Wiener diversity index (0.9) were lower in 2005.

2.2.2.3. Fish

The health of fish populations and the types of fish species residing in the stream are used to draw conclusions about the overall health of a stream. The Anacostia River has generally shown less diversity in its fish population in comparison to the Potomac River. However, the current condition of fish resources is improving for several game fish species that include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), striped bass (*Morone saxatilis*), black crappie (*Pomoxis nigromaculatus*), and yellow perch (*Perca flavescens*). Approximately 45 species of fish representing 15 families and 30 genera were collected in 1990 from tidewater sites of the District of Columbia. Fish with various life stages and spawning requirements, including anadromous, catadromous, estuarine, and tidal fresh water taxa, were collected during these studies. Anadromous fish swim from the ocean into freshwater to spawn. When the young hatch, they migrate back to the ocean to grow and mature. Catadromous fish such as the American eel (*Anguilla rostrata*), migrate from freshwater into the ocean to spawn and reproduce. Redfin pickerel (*Esox americanus*) and hickory shad (*Alosa mediocris*) were collected during these surveys, while white perch (*Morone americana*) and young of the year (YOY) blueback herring (*Alosa aestivalis*) were most abundant. The occurrence of abnormalities (primarily lesions, deformities, and emaciation) was low at 0.7 percent for the Anacostia River. A 1994 fish survey by the Department of Consumer and Regulatory Affairs (DCRA) reported similar results, with a diversity that included 47 species, 13 families, and 30 genera (USEPA 1997).

According to the National Marine Fisheries Service (NMFS), the lower Anacostia River is a documented spawning ground and migratory corridor for several species of anadromous fish, including alewife (*Alosa pseudoharengus*), blueback herring, hickory shad, and white perch. These species are annually present in the lower Anacostia River during the period of early March to mid-June. These species have certain water quality and habitat requirements related to temperature and pH, as well as sediment composition and water flow, to maintain effective spawning. Anadromous fish will return to the same location each year to spawn, which makes accessibility to these habitats a key component in their reproduction within the lower Anacostia River. Sampling conducted by the DDOE Fisheries and Wildlife Division in 2000 and 2002, collected a dominance of anadromous species that included alewife, blueback herring, and white perch. Other dominant species

collected during this project include gizzard shad (*Dorosoma cepedianum*), spottail shiner (*Notropis hudsonius*), pumpkinseed (*Lepomis gibbosus*), and banded killifish (*Fundulus diaphanus*) (DDOE 2000).

Between 2008 and 2012, the dominant fish species collected by DDOE in the vicinity of the Frederick Douglass Memorial Bridge were blueback herring, gizzard shad, white perch, and bluegill (*Lepomis macrochirus*). Of the four anadromous fish species collected in 2000 and 2002, all were present between 2008 and 2012, except hickory shad, which was only collected in 2008, 2009, and 2010 (one individual). In 2010, the northern snakehead (*Channa argus*), a highly invasive fish species native to China, was first collected in the Project Area by the DDOE. In every subsequent year, the number of snakeheads collected by the DDOE doubled, with the length and weight of the largest individuals increasing each year. Northern snakeheads are an environmental concern because they are effective predators of fish, crustaceans, and amphibians. They may be able to outcompete native top predators and popular gamefish, and alter native fish populations and food webs (MDNR 2013).

Although gamefish species are rebounding in the Anacostia River, several species that were historically abundant in the Anacostia River now occur in lower numbers. These species include white perch, river herring, American shad (*Alosa sapidissima*), American eel, pumpkinseed, and channel catfish (*Ictalurus punctatus*) (DCRA 1996). However, all of these species were collected in the Project Area between 2008 and 2012. The numbers of alewife and blueback herring are very low compared to the one million pounds per year caught before 1975. Overall size of these species, particularly white perch, pumpkinseed, and yellow perch, has decreased, which may be a result of the absence of abundant predators to reduce competition among young life stages of fish. The present species diversity and abundance also represent a decline from historic levels, which is apparent in many taxa known to be sensitive to environmental degradation (Kazyak et al. 1990; LDCRA 1995).

Project coordination with the NMFS during preparation of the DEIS in 2006 indicated the potential occurrence of shortnose sturgeon (*Acipenser brevirostrum*) within the waters of the Anacostia River near the proposed bridge replacement project. The shortnose sturgeon is federally listed as endangered and recent surveys at that time, conducted by the USFWS, had documented the presence of shortnose sturgeon in the nearby Potomac River. A Biological Assessment (BA), addressing potential project impacts to shortnose sturgeon, was prepared by the FHWA during the fall of 2006. In a letter dated February 20, 2007, the NMFS concurred with the findings of the BA that the presence of shortnose sturgeon within the Anacostia River is unlikely and that any impacts to shortnose sturgeon from any activity associated with the project would be discountable.

On April 6, 2012, the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) was formally listed by the USFWS as a federally-endangered species. FHWA and the DDOT prepared a BA for the Atlantic sturgeon in the spring of 2014, as recommended by NMFS (Christine Vaccaro personal correspondence on August 16, 2013). The new BA detailed the Revised Preferred Alternative and included information pertaining to the status of the Atlantic sturgeon within the Project Area. See section 2.4, Threatened and Endangered Species, for further discussion on the shortnose sturgeon and Atlantic sturgeon.

2.2.3 Terrestrial Ecology

2.2.3.1. Vegetation

Due to the urban nature of the Project Area, vegetation and wildlife are limited in diversity. A majority of the Project Area is paved as part of the urban street grid, with few landscaped areas. There are substantial areas of maintained grass on the Navy Yard and the Anacostia Park properties. Large areas of more naturalized vegetation, including trees, occur on the St. Elizabeths property and the Poplar Point portion of the Anacostia Park. The Chesapeake Bay watershed is part of the Atlantic Flyway migration route for Neotropical and intracontinental migrants. As part of the watershed, the Anacostia River provides breeding and stopover habitat for a variety of migrants moving north and south during the respective seasons.

Vegetative communities and wildlife within the Project Area were assessed in detail during field reconnaissance in November and December 2004. Vegetative communities were identified and mapped according to the Anderson Land Use Classification System (Anderson et al. 1976). Cover types were identified to level II, except for wetlands, which are discussed in greater detail in Section 2.2. Lists of all flora and fauna observed during field investigations are provided in Appendix B of the *South Capitol Street Natural Resources Technical Report* (DDOT 2007a). Vegetative communities and Specimen/Special Trees were reevaluated in the field during fall 2013 to verify previously identified trees and add any new trees that had become Specimen/Special Trees since the 2004 fieldwork.

Specimen/Special Trees

As part of the Urban Forest Preservation Act of 2001, the DDOT Urban Forestry Administration reviews all projects that require a permit to alter, build, construct, or demolish. The Urban Forestry Administration requires a permit for the disturbance of any tree within a project with a circumference of 55 inches or greater. These specimen trees are referred to as “Special Trees.” Impacts to a Specimen/Special Tree by an individual or non-governmental organization must be permitted and mitigated prior to disturbance. During preparation of the 2007 NRTR, all trees having a diameter measured at 4.5 feet above the ground of 30 inches or more in diameter were identified and surveyed within Anacostia Park on Poplar Point. This effort was done to facilitate the review process, as well as provide data to the District of Columbia’s tree inventory in support of the legislation. This survey was conducted to supplement the existing data for Special Trees identified and located within the District of Columbia by Casey Trees, a non-profit organization whose mission is to restore, enhance, and protect the tree canopy of the nation’s capital. A total of 64 Specimen/Special Trees were identified within the Project Area during the 2007 NRTR. The 64 trees consisted of 34 American elms (*Ulmus Americana*); 16 willow oaks (*Quercus phellos*); four silver maples (*Acer saccharinum*); two ginkgos (*Ginkgo biloba*); two pin oaks (*Quercus palustris*); and one each of catalpa (*Catalpa speciosa*), American sycamore (*Platanus occidentalis*), weeping willow (*Salix* sp.), and an unknown species.

Specimen/Special Trees were reevaluated within and immediately adjacent to the proposed LOD for the Revised Preferred Alternative by viewing the Casey Trees D.C. Street Trees Map (accessed online at http://caseytrees.org/resources/maps/dc-street-trees/). Surveys were also conducted in October and November of 2013 to augment the

data obtained from the D.C. Street Trees Map. The revised tree survey updated the original survey conducted during the 2007 NRTR. Figure 5 shows the locations of the 97 Specimen/Special Trees identified within the Project Area. The additional trees identified since the 2007 NETR included American elms, willow oaks, red maples (*Acer rubrum*), silver maples, American sycamores, and pin oaks.

Residential Related Vegetation

Much of the vegetation associated with residential land use is limited to lawns and streetscapes. The largest area of residential land use is located on the east side of the Anacostia River, south of I-295. The second area lies west of the Anacostia River between Independence Avenue and the Southeast-Southwest (SE-SW) Freeway. The third area, located on the east side of the Anacostia River and Firth Sterling Avenue east of I-295, borders a small section of deciduous forest but the vegetation is still limited to lawns and street trees. Many of the street trees and landscaped areas are comprised of non-native ornamental species. Maples (*Acer* spp.) comprise approximately 38 percent of all street trees, followed by oaks (31 percent) and elms (10 percent) in the District of Columbia (Casey Trees Endowment Fund 2005). These percentages are also representative of the street tree community within the Project Area.

Commercial Related Vegetation

Commercial land use is concentrated west of I-295 in the northern portion of the Project Area. A majority of the surfaces in this part of the Project Area are paved parking lots for the numerous office buildings and restaurants. The vegetation is limited to street trees and landscaped areas.

Industrial Related Vegetation

Many of the properties within the Project Area are classified as industrial. These areas include the portion of the Project Area west of the Anacostia River, which are located south of Q Street SW on the west side of South Capitol Street and on the east side of South Capitol Street between the Anacostia River and the SE-SW Freeway. The Anacostia Naval station located south of the Frederick Douglass Memorial Bridge also falls into this category. The industrial areas have substantial areas of maintained grass with few trees.

Figure 6: Locations of Specimen Trees within the Project Area

Transportation, Communications, and Utilities

The transportation, communication, and utilities landcover includes the roadways, railways, and the Metro station in the Project Area. The major highways and secondary roadways do not have forested right-of-ways or buffers associated with them, with the exception of Suitland Parkway, but do have a number of street trees and landscaped medians. These small tree lined strips are often very disturbed and are dominated by invasive species, such as rambler rose (*Rosa multiflora*) and Asiatic tearthumb (*Persicaria perfoliata*) and vines, such as horsebrier (*Smilax rotundifolia*) and poison ivy (*Toxicodendron radicans*). Suitland Parkway is characterized by a fringe of trees along the right of way between Suitland Parkway and Howard Road. A thin wooded buffer is located along the south side of Suitland Parkway between Firth Sterling Avenue and Martin Luther King, Jr. Avenue. Vegetation in these areas are characterized as scrub-shrub with a variety of trees including maples, oaks (*Quercus* spp.), and other common hardwoods. The abandoned CSX railway right of way along Firth Sterling Avenue and the Anacostia Metro station are both located on the east side of the Anacostia River adjacent to I-295, and have no vegetation other then maintained grass and a few street trees.

Other Urban or Park Lands

Other urban lands include all urban park areas, such as Anacostia Park and Garfield Park, and recreational baseball fields distributed through the residential areas. The dominant vegetation in these areas is comprised of maintained lawns.

Within the Project Area, Anacostia Park is approximately 100 acres in size but contains several other land class divisions including forest and wetlands. This portion of Anacostia Park is specifically called Poplar Point and was established on a fill area that has characteristically been devoid of trees and includes many exotic species (USEPA 1997). Currently Poplar Point contains primarily early-successional vegetation with a mix of young trees, meadows, and wetland areas. The trees located in the park and concentrated along the Anacostia River include black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica*), and American elm (*Ulmus Americana*). The vegetation found in Poplar Point includes some uncommon species such as Engleman's spikerush (*Eleocharis engelmanii*) which is state-listed in Maryland and the only known District of Columbia location, and fiveangled dodder (*Cuscuta pentagona*). Correspondence from National Park Service indicated that other non-federally listed rare species include field dodder (*Cuscuta campestris*), (now lumped into the fiveangled dodder), honeyvine (*Cynanchum leave*), pale dock (*Rumex altissumus*), Virginia winged rockcress (*Sibara virginica*), and halberdleaf rosemallow (*Hibiscus laevis*).

Garfield Park is bounded by the Southeast/Southwest Freeway, Virginia Avenue, New Jersey Avenue, F Street, South Carolina Avenue, and 3rd Street. The park facilities support a number of recreational uses, including racket and field sports, as well as providing a state of the art playground. The park contains a variety of tree species including swamp white oak (*Quercus bicolor*), pin oak (*Q. palustris*), red oak (*Q. rubrum*), American elm, slippery elm (*Ulmus rubra*), English elm (*Ulmus procera*), hackberry (*Celtis* spp.), magnolia (*Magnolia* spp.), pines (*Pinus* spp.), English holly (I*lex aquifolium*), cherry plum (*Prunus cerasifera*), sweetgum (*Liquidambar styraciflua*), red cedar (*Juniperus virginiana*), horse chestnut (*Aesculus hippocastanum*), maple, and American sycamore.

Forested and Non-forested Wetlands

There are two forested wetlands located in Anacostia Park (Poplar Point) in the area west of the abandoned greenhouses. The dominant vegetation in these areas include American sycamore, black willow, eastern cottonwood (*Populus deltoids*), and pin oak. Approximately 0.57 acre of non-forested emergent and shrub-scrub wetlands are also located in Anacostia Park.

Deciduous Forest

A forest, as defined by the Maryland Department of Natural Resources, must be at least 10,000 square feet in area and contain at least 100 trees with a diameter at breast height of at least two inches. Within the Project Area, there are only two such areas meeting that definition; one north of the intersection of I-295 and Suitland Parkway and the other on the Anacostia Park property on Poplar Point. Both of these areas are significantly disturbed and are comprised of younger aged trees. Smaller areas of upland deciduous vegetation forming woodlots or narrow tree lines are located elsewhere within the Project Area, including west of the Anacostia River near the intersection of the SE-SW Freeway and New Jersey Avenue SE and along many of the main highways east of the Anacostia River. Given the intensive urbanization of the city there is little space available for these smaller woodlots to increase in size. The St. Elizabeths Hospital property adjacent to I-295 contains the largest tract of mid-successional forest. The forest provides the least-disturbed wildlife habitat in the Project Area, although invasive species are also present throughout this forested area including rambler rose and Asiatic tearthumb.

2.2.3.2. Wildlife

The Anacostia River provides an important wildlife corridor linking less developed areas along the Potomac River with habitat in the upper areas of the Anacostia watershed. Based on the habitats available, the wildlife inhabiting the Project Area are species adapted to human disturbance and urbanized conditions. These species include raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and gray squirrel (*Sciurus carolinensis*), as well as various mice and rats (family Muridea). A few less tolerant species have also been documented in the less-developed portions of the project.

The NPS has documented numerous species of plants and animals known to occur within the Anacostia Park property (http://www.nps.gov/archive/nace/poplar-point-species.pdf). A complete list of flora and fauna encountered during field investigations are provided in the 2007 NRTR (DDOT 2007a). No new wildlife species were documented during follow up fieldwork in fall 2013 and spring 2014.

Migratory Birds

The Chesapeake Bay Watershed includes the Potomac River and Anacostia River, and provides an important migratory pathway for migrating birds. Neotropical migrants (birds that spend winters in Central America and South America but nest in North America) are provided protection under the Migratory Bird Treaty Act. This act defines prohibitions and outlines permit requirements.

The Maryland/District of Columbia Records Committee of the Maryland Ornithological Society lists 326 different species of birds that have been documented within the District of Columbia since 1842 (see Appendix B: Maryland Ornithological Society 2007). Many species of Neotropical migrants have been observed along the banks of the Anacostia

River and within Anacostia Park and Poplar Point. These are listed in Appendix B of the 2007 NRTR (DDOT 2007a). Species such as the willow flycatcher (*Empidonax traillii)* is one such species that has been documented breeding within Poplar Point and is known to inhabit only one other location in the District of Columbia. According to NPS personnel, in 2013 there were four pairs of osprey (*Pandion haliaetus*) nesting on or near the Frederick Douglass Memorial Bridge and several others that nested on light boxes along Anacostia Drive. Also, there was an attempted breeding on the Frederick Douglass Memorial Bridge by a pair of peregrine falcons (*Falco peregrinus*) in 2013.

2.2.4 Environmental Consequences

Impacts to fish and wildlife are generally related to terrestrial habitat, such as modification of habitat, and physical and chemical influences that could result in a change in community structure and composition. Other effects could include a minor shift in the wildlife community. The DDOE Fisheries and Wildlife Division identified the major threats to the species of greatest Conservation needs and their habitats in the *District of Columbia Wildlife Action Plan* (DDOE 2006). The primary threats to terrestrial habitats are invasive and alien species, recreation, fragmentation, dumping, and contaminants. The primary threats to aquatic habitats are invasive and alien species, sedimentation, changes to hydrologic regimes, stormwater erosion, and pollution. Impacts to aquatic habitats, such as the Anacostia River wetlands and the Anacostia River, are discussed in Sections 2.2 and 2.1. The only threats to aquatic biota that have the potential to be affected by the project are sedimentation, changes to hydrologic regime, and stormwater erosion. According to the *Anacostia River Hydraulic Analysis and Bridge Scour Evaluation for the Replacement of the Frederick Douglass Memorial Bridge*, CH2M HILL 2013, the new bridge will have no significant adverse impacts on the backwater computations of the Anacostia River. Additionally, since all projected bridge piers of the Revised Preferred Alternative will be placed normal to the flow of the Anacostia River, it will allow maximum conveyance. Sedimentation and stormwater erosion will be mitigated by stormwater runoff treatments and BMPs. Since the project aims to convert existing pavement outside the proposed roadway but within the project right-of-way to BMPs, wherever possible, there may be a reduction in erosive stormwater flows and potentially contaminated runoff and sedimentation.

As part of the Urban Forest Preservation Act of 2001, the DDOT Urban Forestry Administration reviews and inspects every tree affected by a potential project requiring a permit to alter, build, construct, or demolish.

2.2.4.1. No Build Alternative

The No Build Alternative would not affect fish, wildlife, or habitat.

2.2.4.2. FEIS Preferred Alternative

As described in the 2011 FEIS (DDOT 2011), impacts to fish and wildlife within the limits of disturbance of the FEIS Preferred Alternative would be minimal due to the existing level of human disturbance and urbanized conditions of the Project Area. The FEIS Preferred Alternative generally involves the addition of pavement for widened or extended roadways immediately to the outside of the existing roadway and/or on existing roadway right-of-way. The majority of these effects would be to maintained grassy strips or narrow rows of

street trees. These features, particularly the street trees, provide limited terrestrial habitat in the urban setting, though do provide some air quality and aesthetic benefits. Additionally, the FEIS Preferred Alternative would include removal of some existing paved surfaces, including existing interchange ramps and bridge approach roadways. These areas would potentially offer the ability to restore terrestrial habitat.

Based on the data compiled for the *South Capitol Street Natural Resources Technical Report* (DDOT 2007a), the FEIS Preferred Alternative would impact approximately 0.1 acre of wooded areas, primarily in the southeastern part of the Project Area between Howard Road SE and Suitland Parkway. These trees are located along the edge of existing right of way in several wooded areas between Howard Road and Suitland Parkway, the largest wooded area being less than 0.75 acre. These wooded areas are currently located in highly urbanized and disturbed areas; therefore, the loss of these trees would not reduce the current quality of the habitat.

Stormwater management design features associated with the FEIS Preferred Alternative may provide a benefit to certain terrestrial species of amphibians and birds. Stormwater management designs intended to detain roadway runoff may retain water during spring and early summer and act as breeding sites for various species of frogs and toads. Areas that are permitted to become vegetated with cattail, sedges, and rushes may also provide habitat for migrating and breeding birds.

A total of three live specimen trees located along the east side of South Capitol Street, north of M Street would be impacted These three trees are willow oaks measuring 30 inches in diameter at breast height (dbh). Additionally, a lone dead standing silver maple measuring 37 inches dbh is located at the southeast corner of South Capitol Street and N Street. Two specimen trees are located within the limits of disturbance for the FEIS Preferred Alternative along New Jersey Avenue SE but would not be impacted by the project. Two American elms (46 and 36 inches dbh), located between 1st Street and L Street, also would not be impacted. All of these potential impacts are to trees assessed and measured during the 2004 survey.

Impacts to migratory birds are expected to be negligible, with exception to the annually occupied osprey nests located on breakwater piers of the existing Frederick Douglass Memorial Bridge. Any nests will be removed during the non-nesting season, once the new Frederick Douglass Memorial Bridge is completed and demolition of the old bridge begins. Impacts to migratory birds would result from the clearing or demolishing of nesting habitat during the nesting season when eggs and young are present.

2.2.4.3. Revised Preferred Alternative

Differences between the FEIS Preferred Alternative and the Revised Preferred Alternative are minimal with respect to potential impacts to terrestrial and aquatic habitat and wildlife. As noted for the FEIS Preferred Alternative, most impacts would be the result of widening or extending existing roadways, and these impacts would be mostly to disturbed forested or shrubby habitat or managed lawns.

Impacts to aquatic biota, primarily fish, would be expected to be minimal, as the project proposes to use specific conservation measures during construction of the new bridge. During bridge construction, time of year restrictions will be in place between February 15 and July 1 to protect anadromous fish and to minimize the potential impact to shortnose and Atlantic sturgeon (See Section 2.4). Further protective measures, such as

cofferdams, will also be used during bridge pier construction to contain disturbed sediments, as well as to reduce sound and shock waves to further minimize impacts to fish.

Based on the current limits of disturbance for the Revised Preferred Alternative, forest impacts would total 2.1 acres. These impacts would primarily occur within Anacostia Park. Smaller woodlot and tree line impacts would also occur to the area along New Jersey Avenue just east of the Southeast/Southwest Freeway and adjacent to major highways east of the Anacostia River. Forest impacts for the Revised Preferred Alternative would be only slightly greater than for the FEIS Preferred Alternative. However, the difference likely will not be significant once the design of the Revised Preferred Alternative has been refined to show actual cut/fill limits for proposed grading, as the impacts are all associated with minor roadway widening/improvements. These impacts are not expected to result in a significant decline in wildlife, as the impacted resources are already disturbed and support primarily transient species of birds and smaller mammals.

Specimen/Special Tree impacts would potentially be greater for the Revised Preferred Alternative than that described for the FEIS Preferred Alternative. The greater number of Specimen/Special Tree impacts results from an increase in the number of identified trees since 2007 and because of the larger limits of disturbance described in the previous paragraph. New Specimen/Special Tree impacts would occur along South Capitol Street and adjacent side streets west of the Anacostia River (24 trees), New Jersey Avenue (five trees), on Anacostia Drive SE where it loops onto westbound South Capitol Street at the bridge (one tree), north of Howard Road SE west of I-295 (one tree), along Martin Luther King Jr. Avenue SE north of Summer Road SE (one tree), and along Suitland Parkway east of Martin Luther King Jr. Avenue SE (ten trees), totaling 42 trees.

Impacts to migratory birds are anticipated to be negligible for the Revised Preferred Alternative similarly to what was described for the FEIS Preferred Alternative. However, impacts to migratory birds could occur if clearing of vegetation during the breeding season disrupts nesting. Impacts would also occur during demolition of the old Frederick Douglass Memorial Bridge if the osprey or peregrine falcons return to the bridge to nest. While peregrine falcons are no longer a federally listed species, the USFWS continues to monitor their populations. Also, both species are protected by the Migratory Bird Treaty Act.

2.2.4.4. Mitigation

Continued coordination with DDOT's Urban Forestry Administration would ensure avoidance and minimization of Specimen/Special Tree impacts resulting from the Build Alternatives. Unavoidable impacts to trees designated as a Specimen/Special Tree will not require a permit, because only individuals or non-governmental entities are required to obtain permits and to comply with compensation measures. However, the project proposes to plant trees as part of the project landscaping design, and these trees will have the potential to become Specimen/Special Trees in the future. Trees and shrub species, which provide wildlife habitat, would be included in the project's landscape plan.

Under the Migratory Bird Treaty Act, removal of an existing osprey or peregrine falcon nest from the Frederick Douglass Memorial Bridge before demolition would require a permit from the USFWS. Coordination with the USFWS during the permit application

process will likely include identifying an alternative nest platform for the osprey. Placement of a nest box onto the new Frederick Douglass Memorial Bridge for use by peregrine falcons could also mitigate for the lost breeding opportunities on the old bridge. This method was used successfully on the replacement Woodrow Wilson Bridge over the Potomac River.

BMPs and currently acceptable design and construction procedures would be used to reduce or eliminate anticipated undesirable effects resulting from construction. Construction activities would be planned to minimize unnecessary disturbance to wildlife habitat. Habitat could be removed during months when migratory birds are not nesting. Erosion control and stormwater management would also be implemented during construction to further minimize disturbance to adjacent terrestrial and aquatic habitat areas. Demolition of the old Frederick Douglass Memorial Bridge will likely be accomplished using non-blasting techniques to avoid impacts to Anacostia River aquatic biota. Dredging is not currently proposed for construction or demolition for this project. Additionally, impact reduction techniques such as scare charges, physical barriers (e.g., cofferdams), and bubble curtains will be used to mitigate potential impacts from underwater blasting or pile driving, if they were to occur during construction of this project. Turbidity curtains may also be used around pier construction to provide a physical barrier around pile driving activities to contain suspended solids from leaving the construction site.

2.3 Threatened and Endangered Species

Threatened and endangered species are regulated at the federal level by the Endangered Species Act of 1973, as amended. The Endangered Species Act was established to help in the preservation and recovery of listed species. The law is administered by the USFWS and the NMFS. The USFWS is responsible for terrestrial and freshwater species, while the NMFS is responsible for marine and anadromous species.

At the local level, the NPS Center for Urban Ecology, in support of the Endangered Species Act, has created the Threatened and Endangered Species Program. Those species considered rare in the District of Columbia are the same species that are federally listed by the NMFS and USFWS as being threatened or endangered. This program participates in conservation efforts for these species through research, reintroduction, species monitoring, and invasive plant management. This program also assists parks with compliance under the Endangered Species Act and cooperates with the USFWS and NMFS.

2.3.1 Agency Coordination

Between June 2005 and February 2007, DDOT coordinated with both the USFWS and NMFS to ensure the South Capitol Street project did not jeopardize the existence of any federally threatened or endangered species. Early coordination with the NMFS focused on planning for a new Frederick Douglass Memorial Bridge crossing of the Anacostia River. A letter dated July 7, 2005 from the NMFS indicated that their primary concern pertained to the replacement of the Frederick Douglass Memorial Bridge (DDOT 2007). This correspondence outlined a variety of issues regarding anadromous fishes for their avoidance or minimization of construction impacts such as sedimentation, heavy underwater shockwaves, erosion, waterway blockage, and habitat modification.

Additionally, the NMFS determined that the endangered shortnose sturgeon (*Acipenser brevirostrum*) is present in the upper tidal Potomac River, and could potentially occur in the lower Anacostia River.

USFWS correspondence dated August 31, 2005, indicated that there are no federally proposed or listed threatened or endangered species known to exist in the South Capitol Street Project Area. The letter stated that a Biological Assessment (BA) or further Section 7 consultation under the Endangered Species Act would not be necessary for species under their jurisdiction (DDOT 2007). This correspondence also included a statement suggesting that DDOT contact the NPS for a list of rare species within the District of Columbia.

In correspondence, dated November 29, 2005, the NPS identified five non-federally listed rare plants within the South Capitol Street Project Area.

A letter dated June 22, 2006 from the USFWS reiterated that no species under their jurisdiction were known to occur within the Project Area and that no further Section 7 consultation with USFWS was necessary. The letter also outlined a concern of the USFWS for impacts related to communication towers on migratory birds.

Project coordination with the NMFS during preparation of the original NRTR and DEIS in 2006 indicated the potential occurrence of shortnose sturgeon within the waters of the Anacostia River near the proposed bridge replacement project. The shortnose sturgeon is federally listed as endangered and recent surveys at that time, conducted by the U.S. Fish and Wildlife Service (USFWS), had documented the presence of shortnose sturgeon in the nearby Potomac River. In December 2006, the DDOT requested consultation with the NMFS pursuant to Section 7 of the Endangered Species Act, as amended, for the shortnose sturgeon. A BA addressing potential project impacts to shortnose sturgeon was prepared by the DDOT during the fall of 2006. In a letter dated February 20, 2007 (DDOT 2007), the NMFS concurred with the findings of the BA that the presence of shortnose sturgeon within the Anacostia River is unlikely and that any impacts to shortnose sturgeon from any activity associated with the project would be discountable. See the *South Capitol Street Natural Resources Technical Report* (DDOT 2007) for additional information.

Further correspondence with the NMFS in August 2013 (email correspondence from Christine Vaccaro, Fisheries Biologist, National Oceanic and Atmospheric Administration) confirmed that a BA for the Atlantic sturgeon would also be required for the project. The Atlantic sturgeon was formally listed by the USFWS as an endangered species on April 6, 2012. The DDOT prepared a new BA to address the likelihood of occurrence of the Atlantic sturgeon within the Anacostia River and what, if any, impacts to the species could occur from construction of the South Capitol Street project. The Atlantic sturgeon BA was submitted to the NMFS and concurrence on the findinngs has been received from the NMFS.

2.3.2 Biological Assessment

The *Biological Assessment* (BA) *of Impacts to the Shortnose Sturgeon (Acipenser brevirostrum)* prepared by DDOT in December 2006 follows requirements outlined in 50 CFR 402.12. The BA discusses in detail the various construction activities related to the new Frederick Douglass Memorial Bridge crossing and demolition of the existing bridge. A copy was provided in the *South Capitol Street Natural Resources Technical Report*

(DDOT 2007). The BA determined that the South Capitol Street project "May Affect, but is Not Likely to Adversely Affect" the shortnose sturgeon. This determination is appropriate as any effects are considered discountable, meaning that they are extremely unlikely to occur, as defined in the USFWS and NMFS Consultation Handbook (USFWS and NMFS 1998). In a letter dated 20 February 2007, the NMFS concurred with the determination that the project is "Not Likely to Adversely Affect" any listed species under NMFS jurisdiction, including the shortnose sturgeon. See the *South Capitol Street Natural Resources Technical Report* (DDOT 2007) for additional information.

The *Biological Assessment of Impacts to the Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus)* prepared by DDOT in May of 2014 addressed the potential presence of that species within the Project Area and discussed potential impacts to the species from construction activities associated with replacement of the Frederick Douglass Memorial Bridge. The BA concluded that, as with the shortnose sturgeon, the project is "Not Likely to Adversely Affect" the Atlantic sturgeon. This determination was made based on the extreme low likelihood of occurrence of Atlantic sturgeon within the Anacostia River and specific construction techniques and time of year restrictions that will minimize any potential impacts to sturgeon. The Atlantic sturgeon BA was submitted to the NMFS in June of 2014. A final determination by the NMFS has not yet been received.

2.3.3 Conservation Measures

Conservation measures are defined as actions that benefit or promote the recovery of a listed species that are included as an integral part of a proposed action. The following conservation measures were developed from similar projects that are or have occurred within the Potomac River watershed: the Woodrow Wilson Bridge and 11th Street Bridges replacement projects. These methods have been proven effective in reducing impacts to fish during construction of the Woodrow Wilson Bridge.

2.3.3.1. Time-of-Year Restrictions

Time-of-year restrictions on construction activities (underwater blasting, cofferdam installation, pile driving, dredging) will be employed to ensure that in-stream construction activities will occur outside of the likely period of shortnose sturgeon or Atlantic sturgeon occurrence. The life history of the shortnose sturgeon suggests that young of the year shortnose sturgeon could be present in the Project Area from February 15 to July 1. Any potential occurrence of Atlantic sturgeon would be transient adults on spawning runs between March 1 and April 30. Therefore, in-stream construction work, such as described above, would be restricted between February 15 and July 1. This restriction would exclude work within previously constructed cofferdams.

2.3.3.2. Dredging Techniques

Dredging is not currently proposed for construction of the new Frederick Douglass Memorial Bridge or demolition of the existing bridge. Regulatory agencies generally recommend the use of mechanical (clamshell) dredging rather than hydraulic dredging. Should dredging become necessary during activities associated with replacement of the Frederick Douglass Memorial Bridge, then only mechanical dredging will be used and a time-of-year work restriction will be discussed and agreed to between all appropriate regulatory agencies.

2.3.3.3. Technical Impact Reduction Techniques

These techniques can be used to reduce the pressure wave from pile driving or to repel potentially impacted fish from the immediate area. Impact reduction techniques, such as scare charges, physical barriers (e.g., cofferdams), and bubble curtains would be used to mitigate potential impacts from underwater blasting or pile driving during construction. Turbidity curtains may also be used around pier construction to provide a physical barrier between pile driving activities and fish. These curtains would also act to contain suspended solids from leaving the construction site.

Cofferdams would be the likely technique used to reduce the shock wave from pier construction. However, shock waves resulting in fish kills are still possible depending upon the force of the pile driving, depth of the water, substrate, and size of the piles. If piles larger than 66 inches in diameter will be needed for construction of the Frederick Douglass Memorial Bridge, then consideration would be given to using cofferdams in conjunction with bubble curtains to reduce shock waves in the surrounding water to below six pounds per square inch (PSI), the cutoff pressure at which other bridge construction projects have noted fish kills.

2.3.4 Environmental Consequences

2.3.4.1. FEIS Preferred Alternative

A BA for the shortnose sturgeon was prepared in 2006 by DDOT for compliance with the Endangered Species Act. Based on the natural history of the sturgeon, general construction activities, and chemical and physical characteristics of the Anacostia River, the BA determined that the South Capitol Street project “May Affect, but is Not Likely to Adversely Affect” the shortnose sturgeon. This determination is appropriate, as any effects are considered discountable, meaning that they are extremely unlikely to occur as defined in the USFWS and NMFS Consultation Handbook (USFWS and NMFS 1998). In a letter dated 20 February 2007, the NMFS concurred with the determination that the project is “Not Likely to Adversely Affect” any listed species under NMFS jurisdiction, including the shortnose sturgeon.

2.3.4.2. Revised Preferred Alternative

In April of 2012, the Atlantic sturgeon became listed as an endangered species under the Endangered Species Act. A BA for the Atlantic sturgeon was prepared in 2014 by DDOT to evaluate potential impacts to the species from the Revised Preferred Alternative bridge design. The BA determined that the likelihood of occurrence of Atlantic sturgeon within the Anacostia River is extremely low and that conservation measures agreed to during consultation for the shortnose sturgeon would also apply for the Atlantic sturgeon. The BA reached a determination of “Not Likely to Adversely Affect” the Atlantic sturgeon. The BA is currently under review by DDOT and will be submitted to the NMFS for their review and final determination.

2.3.4.3. Mitigation

Mitigation is not required for the shortnose sturgeon and is likewise not anticipated to be required for the Atlantic sturgeon. However, to reach the determination of "May Affect, Not Likely to Adversely Affect" for the shortnose sturgeon, the conservation measures discussed in the BA relating to construction techniques were agreed upon by DDOT and the FHWA. The same conservation measures would apply to the Atlantic sturgeon. Conservation measures are not mitigation but actions to benefit or promote the recovery of listed species.

2.4 Floodplains

The National Flood Insurance Program defines 100-year floodplains as "areas that will be inundated by the flood event having a one percent chance of being equaled or exceeded in any given year". Executive Order 11988 (Floodplain Management) and 23 CFR 650.11 require that federal actions, to the extent possible, avoid short-and long-term impacts to floodplains and avoid direct or indirect support of floodplain development where a practicable alternative exists. The DDOE, Watershed Protection Division reviews all projects proposed within the District of Columbia floodplains as part of the District of Columbia Floodplain Management Program to ensure that the development is consistent with the need to minimize or eliminate flood damage. The District of Columbia's program also coordinates most of its activities with the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) and the USACE. The 100-year floodplains were located within the Project Area using the FEMA Digital Flood Insurance Rate Maps (DFIRM) for Washington, District of Columbia. The DFIRM database is derived from Flood Insurance Studies (FIS), previously published FIRMs, flood hazard analysis preformed in support of the FISs and FIRMs, and new mapping data where available. Floodplains in the Project Area were revised in 2010, and therefore, are different from the floodplain boundaries described in the *South Capitol Street Natural Resources Technical Report* that was published in 2007. Generally, the 100-year floodplain has been expanded east and west of the Anacostia River within the Project Area.

The Project Area crosses the 100-year floodplain of the Anacostia River. The floodplain extends out east and west of the Anacostia River to the north and south of the existing Frederick Douglass Memorial Bridge. West of the river, the floodplain extends outside of the banks an average of 200 feet with some areas reaching inward of 200 to 500 feet along low-lying areas and approximately 1,200 feet over the Navy Yard property. East of the river, the floodplain extends outside of the banks an average of 800 to 1,600 feet. A majority of the floodplain in the Project Area has been modified to accommodate the development and urbanization of the lower Anacostia River.

Two flood control devices are located in the Project Area on the east bank of the Anacostia River along Poplar Point. A levee extends from the Bolling Air Force Base and the Anacostia Naval Station to the tip of Poplar Point. Inside the military bases, this levee consists primarily of an earthen berm, upon which exists a paved multi-use trail. Outside of the Anacostia Naval Station fence, the levee continues upstream as an earthen berm without a trail, ending near the Poplar Point pump station. Upstream of the levee, a floodwall starts at the point where the higher Poplar Point ground meets the lower ground near the NPS park headquarters facility in Anacostia Park. The remainder of the levee is

comprised of steel pilings. The levee is maintained by public agencies, including the NPS and U.S. Navy.

Executive Order 11988 regulates floodplain impacts and is administered locally by a floodplain coordinator, the DDOE within the District of Columbia. This order requires federal actions to avoid impacts, short-term and long-term, to floodplains to the extent possible. A Finding of No Practical Alternative is prepared for projects with unavoidable impacts to floodplains.

Bridge projects are generally assessed using the USACE's Hydrological Engineering Center-River Analysis System program or similar computer analysis programs to evaluate whether or not a bridge would increase the floodwater elevations before they are approved by floodplain regulation administrators.

Within the Project Area, the 100-year floodplain of the Anacostia River extends primarily onto the western shore of the Project Area. The eastern shore of the Project Area, however, provides minimal floodplain storage for the Anacostia River. That area is located between Anacostia Drive to just upstream of the Poplar Point pump house and associated flood control devices within the Project Area.

2.4.1 Environmental Consequences

The environmental consequences of the FEIS Preferred Alternative are based on the earlier Anacostia River hydraulic model that was shown on FEMA's published FIS and FIRM dated November 15, 1985. The FEIS Preferred Alternative involves construction of an arched-bascule bridge that would span the floodplain transversely. The Revised Preferred Alternative bridge would span the Anacostia River more perpendicularly, and would also extend over approximately 1.59 acres of the east and west floodplains. Spanning generally avoids backwater effects upstream of the bridge. Currently, the majority of the western floodplain area is a concrete helipad and large petroleum-based fuel storage tanks with a very small vegetated riparian zone. The eastern floodplain lies behind a levee and includes Poplar Point Park.

2.4.1.1. FEIS Preferred Alternative

The length of the new Frederick Douglass Memorial Bridge for the FEIS Preferred Alternative is 1,650 feet between the abutments, and the arched-bascule bridge type provides the required 250-foot width navigation channel. The new bridge would provide a minimum of 35-foot vertical clearance (freeboard) from the maximum high water level of the Anacostia River to the bottom of the bridge. This vertical clearance is the required minimal clearance for the marine navigation channel. The proposed dimensions for the navigational envelope, which have been approved by the USCG, are slightly smaller than dimensions provided by the existing bridge. The current navigational envelope has a 250-foot horizontal clearance and a 42-foot vertical clearance. The height of the FEIS Preferred Alternative bridge is constrained by the grades and elevations of the approach roadway connections to South Capitol Street and Suitland Parkway. The vertical profile developed for the new bridge maintains relatively flat grades across the bridge. Further design details, renderings, and profiles of the bridge type are provided in the *Frederick Douglass Memorial Bridge Alignment Study Report* (DDOT 2007).

The arched-bascule bridge type minimizes the total number of piers as well as the number of piers in the water. The FEIS Preferred Alternative proposes placement of one pier

within the 100-year floodplain. Furthermore, design of the new bridge would span the existing levee along the eastern shoreline of the Anacostia River avoiding any impact to the levee. Further design details, renderings, and profiles of the bridge type are provided in the *Frederick Douglass Memorial Bridge Alignment Study Report* (DDOT 2007) and the *Frederick Douglass Memorial Bridge Design Workshop and Preferred Alternative Technical Report* (DDOT 2009).

An analysis of the hydraulic effects of a new arched-bascule bridge over the Anacostia River was conducted. Existing, interim, and proposed conditions were modeled for 10-year, 50-year, 100-year, and 500-year storm events from the mouth of the Anacostia River to approximately 1.48 river miles upstream of the existing Frederick Douglass Memorial Bridge (the existing bridge is located at river mile 0.56). The computed water surfaces showed little or no variation between the storm events (*South Capitol Street Project Hydrology/Hydraulics Technical Report,* DDOT 2007). The computed water surface elevations along the study reach of the existing conditions model show, at most, a 0.02-foot increase for each of the selected storm events. These minor variation cross-sections occur upstream of the existing bridge location.

Construction of a new arched-bascule bridge would have less impact to the flood conveyance capacity (including the Anacostia River plus the 100-year floodplain) than the existing bridge by providing for fewer piers and longer spans. Additionally, once the new bridge is operational, the old bridge would be removed completely. Therefore, the proposed bridge would not pose a substantially larger restriction on the flood conveyance capacity. The *South Capitol Street Project Hydrology/Hydraulics Technical Report* (DDOT 2007) provides further detail regarding the effects of a new bridge.

2.4.1.2. Revised Preferred Alternative

The environmental consequences of the Revised Preferred Alternative are based on FEMA's published FIS and FIRM Panel for the Anacostia River, revised dated September 27, 2010. The Revised Preferred Alternative involves construction of a new fixed span bridge. This new bridge is approximately 1,595 feet long and 122 feet wide. The highest elevation point is about 61 feet, which would provide a maximum of 42 feet of vertical clearance. The bridge would provide a horizontal clearance of 150 feet and will consist of 6 piers ranging from 7.5 to 12 feet wide. The Revised Preferred Alternative proposes the placement of two piers in the 100-year floodplain, one on either side of the Anacostia River. A total of 1.95 acres of floodplain will be impacted by the new bridge design. The new bridge will span the existing levee along the eastern shore of the Anacostia River.

A preliminary hydraulic analysis and preliminary bridge scour evaluation was prepared for DDOT for the Revised Preferred Alternative (*Anacostia River Hydraulic Analysis and Bridge Scour Evaluation for the Replacement of Frederick Douglass Memorial Bridge*, CH2M HILL 2013). This analysis evaluates the potential impacts of the new bridge on floodplains using the methods and criteria listed in DDOT's Design and Engineering Manual (DDEM) and the NFIP regulation. The information below was derived from the *Anacostia River Hydraulic Analysis and Bridge Scour Evaluation for the Replacement of Frederick Douglass Memorial Bridge* prepared by CH2M HILL in 2013.

Water surface elevations were computed for the 10-year, 50-year, 100-year, and 500-year flood events. Comparison of the water surface elevations of the existing and proposed condition reveals no increase in water surface elevation and a maximum decrease of 0.02 feet for the 100-year water surface elevations upstream of the proposed bridge crossing.

In addition, the hydraulic analysis determined that no pressure flow conditions exist for the 100-year and 500-year discharge from the Anacostia River. The 100- and 500-year events flood elevations from the Anacostia River, at the upstream face of the proposed bridge, are about 11 feet and 14 feet. Since the minimum low chord elevation of the proposed bridge is 26 feet, no pressure flow will occur for the 100-year and 500-year flooding conditions.

Since all projected bridge piers of the Revised Preferred Alternative will be placed normal to the flow of the Anacostia River, it will allow maximum conveyance. In addition, piers that are aligned with the flow will minimize scour. Results of the preliminary hydraulic analysis conclude that the new bridge has no significant adverse impacts on the backwater computations of the Anacostia River (CH2M HILL 2013). Further details regarding the effects of the new bridge are provided in the *Anacostia River Hydraulic Analysis and Bridge Scour Evaluation for the Replacement of Frederick Douglass Memorial Bridge* (CH2M HILL 2013).

2.4.1.3. Mitigation

Design of the new Frederick Douglass Memorial Bridge and its approaches would be in accordance with current drainage practices and standards to minimize the impacts to floodplains and flood elevations. DDOT would work with local agencies and the FEMA as required, to ensure project development in accordance with local flood hazard development permit requirements, floodway plans, and floodplain management programs.

2.5 Geology, Topography, and Soils

Information on topography, geology, and soils was gathered from the USGS, MGS, and NRCS sources. Soils information is derived from the USDA *Soil Conservation Service Soil Survey of District of Columbia* (1976) and the updated *Soil Survey Geographic Database for District of Columbia* (2006). The geology, topography, and soils in the Project Area have remained primarily unchanged since the published *South Capitol Street Natural Resources Technical Report* (DDOT 2007).

2.5.1 Geology

The South Capitol Street Project Area is located entirely within the Coastal Plain Physiographic Province. It is underlain by Quaternary lowland sedimentary deposits of the Pleistocene throughout the western portion of the Project Area. The thickness of these deposits ranges from zero to 150 feet with a composition of gravel, silt, and clay. The eastern portion of the Project Area is composed of both Quarternary lowland and the Potomac Group, a Cretaceous period formation composed of interbedded quartzose gravels, protoquartzitic to orthoquartzitic argillaceous sands, in addition to multicolored silts and clays. The USDA *Soil Conservation Service Soil Survey of District of Columbia* (1976) states that this deposit has a thickness of zero to 800 feet. No areas of bedrock outcrops or important mineral resources were identified in the Project Area.

2.5.2 Topography

Topography in the Project Area is relatively flat, with elevations ranging from zero to 25 feet above sea level. The highest elevations are located in the eastern and western-most portions of the Project Area, along Interstate-295 (I-295) and surrounding the Capitol

building. The lowest elevations are along the Anacostia River. Much of the topographic landscape has been altered for development, such as raised berms for highways and grading of topographic relief for the urban street grid.

2.5.3 Soils

A total of six soil associations and 27 soil types are located within the South Capitol Street Project Area according to USDA (1976). These soil associations include the Urban Land, Urban Land-Galestown-Rumford, Urban Land-Christiana-Sunnyside, Urban Land-Sassafras-Chillum, Luka-Lindside-Cordorus, and the Udorthents association, and consist of the following characteristics as described by USDA (1976):

- Urban Land association – consists of nearly level to moderately sloping areas, most of which are occupied by structures
- Urban Land-Galestown-Rumford association – consists of urban land and deep, nearly level to moderately sloping, somewhat excessively drained soils that are mostly sandy throughout
- Urban Land-Christiana-Sunnyside association – consists of urban land and deep, nearly level to steep, well drained soils that are underlain by unstable clayey sediment
- Urban Land-Sassafras-Chillum association – consists of urban land and deep, nearly level to steep, well drained soils that are underlain by sandy and gravelly sediment
- Luka-Lindside-Cordorus association – consists of deep, nearly level, moderately well drained soils that are underlain by stratified alluvial sediment or man-made deposited dredged material
- Udorthents association – consists of deep to moderately deep, nearly level to steep, well drained soils composed of cuts, fills, or otherwise disturbed land; soils in this association are widely varied and generally reflect the texture of soils mapped in adjacent areas

Soils in the Project Area are dominated by Urban Land west of the Anacostia River. East of the Anacostia River, dominant soils include Urban Land, Udorthents, Christiana Urban Land Complex, and Melvin silt loam. Melvin silt loam, Fluvaquents, Udifluvents, and Dunning soils are all located within the Project Area east of the Anacostia River, and are listed as hydric soils by NRCS. Geotechnical investigations presented in the *Preliminary Geotechnical Subsurface Conditions Assessment Report* (DDOT 2006) confirmed soil types present within the Project Area. Table 7 depicts each of the 27 soil units found in the Project Area and characteristics of the units. Figure 6 shows the locations of the soil units within the Project Area.

Table 7: Soils within the Project Area

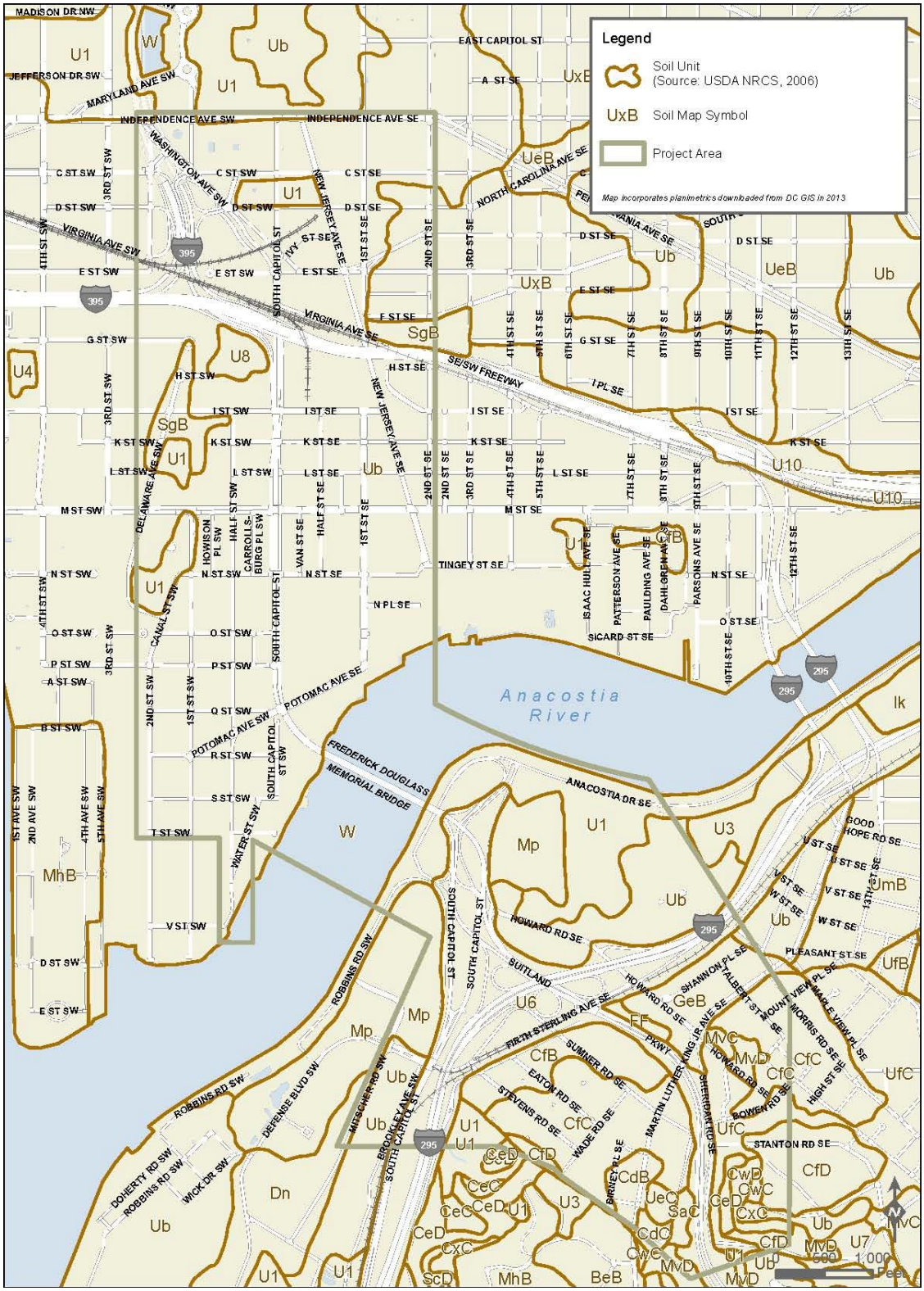
Map Symbol	Soil Name	Drainage Class	Highly Erodible Land	Hydric
CdB	Chillum-Urban Land Complex, 0-8 percent slopes, moderately to severely eroded	Well Drained	Potentially	No
CdC	Chillum-Urban Land Complex, 8-15 percent slopes, moderately to severely eroded	Well drained	Potentially	No

Table 7: Soils within the Project Area

Map Symbol	Soil Name	Drainage Class	Highly Erodible Land	Hydric
CeC	Christiana Silt Loam, 8-15 percent slopes, severely eroded	Well Drained	Yes	No
CeD	Christiana Silt Loam, 15-40 percent slopes, severely eroded	Well Drained	Yes	No
CfB	Christiana Urban Land Complex, 0-8 percent slopes, severely eroded	Well Drained	Potentially	No
CfC	Christiana Urban Land Complex, 8-15 percent slopes, severely eroded	Well Drained	Potentially	No
CfD	Christiana Urban Land Complex, 15-40 percent slopes, severely eroded	Well Drained	Potentially	No
CwC	Croom very gravelly sandy loam, 8-15 percent slopes	Well Drained	Yes	No
CwD	Croom very gravelly sandy loam, 15-40 percent slopes	Well Drained	Yes	No
CxC	Croom-Urban Land Complex, 8-15 percent slopes, severely eroded	Well Drained	Potentially	No
Dn	Dunning soils	Very poorly drained	Potentially	Yes
FF	Fluvaquents-Udifluvents Complex, frequently flooded	N/A	No	Yes
GeB	Galestown-Urban Land Complex, 0-8 percent slopes, moderately eroded	Well Drained	Potentially	No
MhB	Matapeake-Urban Land Complex, 0-8 percent slopes, moderately to severely eroded	Well Drained	Potentially	No
Mp	Melvin Silt Loam, slight erosion	Poorly Drained	No	Yes
MvC	Muirkirk Variant Complex, 8-15 percent slopes, severely eroded	Well Drained	Yes	No
MvD	Muirkirk Variant Complex, 15-40 percent slopes, severely eroded	Well Drained	Yes	No
SaC	Sassafras sandy loam, 8-15 percent slopes	Well Drained	No	No
SgB	Sassafras-Urban Land Complex, 0-8 percent slopes, moderately to severely eroded	Well Drained	Potentially	No
U1[1]	Udorthents, varied erosion	Varied	Potentially	No
U3[1]	Udorthents, Sandy, varied erosion	Varied	Potentially	No
U6[1]	Udorthents, Smoothed, varied erosion	Varied	Potentially	No
U8[1]	Udorthents, Sandy, Smoothed, varied erosion	Varied	Potentially	No
Ub	Urban Land, varied erosion	Varied	No	No
UeC	Urban land-Chillum complex, 8-15 percent slopes	Well Drained	Yes	No
UfC	Urban Land-Christiana Complex, 8-15 percent slopes, severely eroded	Well Drained	Potentially	No
UxB	Urban Land-Sassafras Complex, 0-8 percent slopes, moderately to severely eroded	Well Drained	Potentially	No

Note: Soils in this unit area are widely varied and generally reflect the texture of soils mapped in adjacent areas (USDA Soil Survey of District of Columbia 1976).

Figure 7: Soils within the Project Area



Seven of the 27 soil types in the Project Area are classified as "highly erodible land," with 16 listed as potentially highly erodible. Highly erodible land is susceptible to the erosive forces of wind and water. If precautions are not taken during construction, these soils can be washed into nearby streams resulting in stream channel destabilization, increased flooding, and loss of aquatic habitat. Implementing sediment erosion control measures such as vegetative stabilization, silt fences, and sediment traps can minimize soil erosion impacts.

A description of each soil map unit from the USDA Soil Survey follows:

- Chillum-Urban Land Complex **(CdB)** consists of nearly level to gently sloping, well drained soils of the Chillum series, most areas that have been altered by grading for housing developments, shopping centers, industrial areas and similar uses. The Chillum soils and Urban land occur together in such an intricate pattern in this complex, but it was not practical to separate them in USDA soil survey mapping so they are addressed together. The predominant texture of this soil is silt loam, and many areas have been covered over by 20 inches of fill. This complex is found in urbanized upland areas of the Coastal Plain and is located in the southeastern portion of the South Capitol Street Project Area.
- Christiana Silt Loam 8-15% slopes **(CeC)** and 15-40% slopes **(CeD)** is a moderately to steep sloping soil found on the higher elevations of the Coastal Plain. This soil has a high available water capacity and has been determined to have poor potential for building purposes due to instability. Areas that have been graded or disturbed can be dangerous to build on and cuts and excavations are extremely difficult to stabilize. In areas where it is unlimed, this soil is very strongly acid to extremely acid, posing a risk to the adjacent environment. This soil unit is located in the southeastern portion of the South Capitol Street Project Area.
- Christiana Urban Land Complex 0-8% slopes **(CfB)**, 8-15% slopes **(CfC)**, and 15-40% slopes **(CfD)** consists of nearly level to steep sloping, well drained soils of the Christiana series, most areas of which have been altered by grading for housing developments, shopping centers, industrial areas, and similar uses. It is found on high elevations of urbanized areas of the Coastal Plain. The predominant texture of this soil is silt loam, and many areas have been covered over by 20 inches of fill or have had as much as two-thirds of the original profile removed by cutting and grading. This complex has poor potential for most building purposes because of poor stability, with cuts and excavations becoming difficult to stabilize. Areas that have been graded or disturbed can be dangerous to build on. When under pressure, clay in this soil can squeeze out from under building foundations and footings causing settlement and cracks that can lead to significant building damage. Banks and fills of soil material have collapsed in some areas. Available water capacity is high in relatively undisturbed areas and low in Urban land cut and fill situations. In areas where it is unlimed, this soil is very strongly acid to extremely acid, posing a risk to the adjacent environment. This soil unit is located in the southeastern portion of the South Capitol Street proejct area.
- Croom very gravelly sandy loam 8-15% slopes **(CwC)** and 15-40% slopes **(CwD)** consists of moderately to strongly sloping, well drained soils found on ridge tops and sides of slopes of strongly dissected upland areas of the Coastal Plain. The

predominant texture of this soil is very gravelly loam. Runoff on this soil is rapid and the hazard of erosion is severe. In unlimed areas, this soil is generally very strongly acid throughout the profile, posing a risk to the environment. This soil has a fair potential for use as building sites because of slope. This soil unit occurs minimally in the southeast portion of the Project Area.

- Croom-Urban Land Complex **(CxC)** consists of moderately sloping, well drained soils of the Croom series, most areas of which have been graded, cut, filled, or otherwise disturbed during urbanization. This complex is found on ridge tops and side slopes of urbanized areas of the Coastal Plain. The predominant texture of this soil is gravelly sandy loam, and many areas have been covered over by 20 inches of fill or have had as much as two-thirds of the original profile removed by cutting and grading. The available water capacity of this soil is low, with most unlimed areas becoming extremely acidic, posing a risk to the adjacent environment. This complex has only fair potential for most building purposes because of slope. This soil unit is located in the southeastern portion of the South Capitol Street Project Area.
- Dunning soils **(Dn)** consist of nearly level, very poorly drained soils located on floodplains of the Coastal Plain. This soil is one of three hydric soils mapped in the South Capitol Street Project Area. The predominant texture of this soil is silty clay loam. Permeability and runoff is slow in this soil. The water table is at or near the surface for long periods. Due to wetness, this soil has poor building potential. This soil occurs in the southwestern portion of the South Capitol Street Project Area.
- Fluvaquents-Udifluvents **Comple**x **(FF)** is a frequently flooded soil, and one of three hydric soils found in the South Capitol Street Project Area. These poorly drained soils are nearly level and consist of deposited soil materials washed from uplands. They represent unconsolidated alluvium that is stratified and range in texture from loamy sand to fine sandy loam. This unit is subject to frequent changes from stream overflow, and experience flooding at least twice per year. These soils are poorly suited to most uses because of this flooding, but are valuable for natural areas and as habitat for some kinds of wetland wildlife. This soil unit is found in one location in the southeastern portion of the Project Area directly east of the intersection formed by Firth Sterling Avenue and Suitland Parkway.
- Galestown-Urban Land Complex **(GeB)** consists of **nearl**y level to gently sloping, well drained areas of Galestown soils and areas of Urban Land, and is found on urbanized uplands and terraces of the Coastal Plain. The Galestown soils and Urban land occur together in such an intricate pattern in this complex that it was not practical to separate them in USDA soil survey mapping. Consequently, they and are discussed together. Texture has been classified as loamy sand. Galestown soils in this unit have been altered by grading for housing developments, shopping centers, industrial areas, and other similar uses. Urban land has many areas that have been covered over by 20 inches of fill, and have had nearly all of the original profile removed by cutting and grading. Fill material is commonly from adjacent Galetstown areas that have been cut or graded. Areas that are undeveloped in this complex have good potential for building purposes. These soils are droughty and may require irrigation for plant growth. An onsite

investigation is needed to determine the potentials and limitations for any proposed land use. This soil unit is located in the southeastern portion of the Project Area.

- Matapeake-Urban Land Complex 0-8% slopes **(MhB)** consists of nearly level to gently sloping well drained soils of the Matapeake series, and is found on urbanized uplands of the Coastal Plain. The Matapeake soils and Urban land occur together in such an intricate pattern that it was not practical to separate them in the USDA soil survey mapping. Consequently, these soils are discussed together. Most areas in this unit have been altered by grading for housing developments, shopping centers, industrial areas, and other similar uses. Urban land has many areas that have been covered over by more than 20 inches of fill, and have had nearly all of the original profile removed by cutting and grading. Fill material is commonly from adjacent Matapeake areas that have been cut or graded. Available water capacity is high in relatively undisturbed areas and variable in Urban land cut and fill situations. Most unlimed areas are strongly acid, posing a risk to the adjacent environment. This complex has good potential for building purposes. It is located in the southeastern portion of the Project Area.
- Melvin Silt Loam **(Mp)** is the third of three hydric soils found in the South Capitol Street Project Area. It is a nearly level, poorly drained soil found on floodplains along the Anacostia and Potomac rivers. This soil type is located on the northeastern portion of the Project Area. Some areas in this soil type are subject to flooding but most areas along the Anacostia River are protected by berms and levees. These soils are poorly suited to most uses because of this flooding, but are valuable for natural areas and as habitat for some kinds of wetland wildlife.
- Muirkirk Variant Complex 8-15% slopes **(MvC)** and 15-40% slopes **(MvD)** consists of moderately to steep sloping soils on the higher elevations of the Coastal Plain. Muirkirk Variant soils are so variable and occur together in such an intricate pattern with several other similar soils that it was not practical to separate them in USDA soil survey mapping. Consequently, these soils are discussed together. Texture for this soil unit has been determined to be loamy sand. This complex has poor potential for most building purposes because of poor stability with cuts and excavations becoming difficult to stabilize. Areas that have been graded or disturbed can be dangerous to build on. When under pressure, clay in this soil can squeeze out from under building foundations and footings causing settlement and cracks that can lead to significant building damage. Banks and fills of soil materials have collapsed in areas of this soil type further making it dangerous for building purposes. Disturbed areas are highly erodible and present a pollution problem to nearby waterways if adequate sediment retention devices are not employed. It is located in the eastern region of the South Capitol Street Project Area.
- Sassafras sandy loam **(SaC)** consists of moderately sloping, well drained soils located on ridge tops and side slopes of strongly dissected upland areas of the Coastal Plain The predominant soil texture is sandy loam. Permeability and runoff is moderate in this soil. Water capacity and the hazard of erosion are moderate. In unlimed areas, this soil is generally strongly acid, which poses a danger to the environment. This soil has only fair building potential because of slope. This soil unit is located in the southern portion of the Project Area.

- Sassafras-Urban Land Complex 0-8% slopes **(SgB)** consists of nearly level to gently sloping well drained soils of the Sassafras series, and is found on urbanized uplands of the Coastal Plain. Sassafras soils and Urban land occur together in such an intricate pattern that it was not practical to separate them in USDA soil survey mapping. Consequently, these soils are discussed together. Most areas in this unit have been altered by grading for urban land uses. Fill material is commonly from adjacent Sassafras areas that have been cut or graded. Available water capacity is high in relatively undisturbed areas and low to very low in Urban land cut and fill situations. Most unlimed areas are strongly acid, posing a risk to the adjacent environment. This complex has good potential for building purposes and only fair potential for recreation due to limited open space. It is limited to two areas in the central portion of the western region of the South Capitol Street Project Area.
- Udorthents **(U1)** consist of very heterogeneous, earthy, and inorganic man-made fill material that has been placed on poorly drained to somewhat excessively drained soils on the upland terraces of the Coastal Plain to provide building and roadway sites. Slopes are complex and irregular and the thickness of fill is quite variable, with an average measure of more than 20 inches. The majority of places were this soil type is found are covered by urbanized uses. These soils vary in texture and generally reflect the texture of soils mapped in adjacent areas. Due to subsidence, these soils have a poor potential for nearly any use. This soil is located throughout the South Capitol Street Project Area.
- Udorthents **(U3)** consists of heterogeneous man made material and organic soils that mirror U1 areas with the exception of their texture, which is predominantly sandy. This soil is located in the northeast corner of the South Capitol Street Project Area.
- Udorthents **(U6)** consists of areas that have been cut or filled during grading for roadway and railroad projects. Composition is variable, with a texture that is predominantly smoothed. Areas of this soil that needed fill to complete a project were leveled with material cut in the same area. Most unlimed areas are strongly acid, posing a risk to the adjacent environment. Due to subsidence, these soils have a poor potential for building uses. This soil is limited to the eastern half of the South Capitol Street Project Area.
- Udorthents **(U8)** consists of areas that have been cut or filled during grading for various construction projects. Composition is variable, with a texture that is predominantly sandy and smoothed. This unit has poor potential for building use due to subsidence and poor potential for recreation due to sandiness. This soil is limited to one location in the north central portion of the western half of the South Capitol Street Project Area.
- Urban Land **(Ub)** consists of areas that are over 80 percent covered by urban land and its associated uses. Soil is extremely variable and made up of miscellaneous artificial fills placed over wetlands, tidal marshes, and floodplains. This soil is found throughout the South Capitol Street Project Area.
- Urban land-Chillum complex **(UeC)** consists of areas of Urban land and Chillum soils, located in moderately sloping upland areas of the Coastal Plain that have been urbanized. This soil has been greatly altered by grading for housing

developments, shopping centers, industrial areas, and similar uses. The predominant soil texture is silt loam. Permeability is moderate where the soils are relatively undisturbed and is variable in disturbed areas. Water capacity is moderate where the soils are relatively undisturbed and low in disturbed areas. Runoff is rapid and the hazard of erosion is severe. Due to the urbanized nature of these soils, an onsite investigation is needed to determine the potentials and limitations of this complex for any use. This soil unit is located in the southern portion of the Project Area.

- Urban Land-Christiana Complex 8-15% slopes **(UfC)** consists of nearly level to gently sloping, well drained soils of the Christiana series, which have been altered by grading for housing developments, shopping centers, industrial areas, and similar uses. It is found on high elevations of urbanized areas of the Coastal Plain. The predominant texture of this soil is silt loam, and many areas have been covered over by 20 inches of fill or have had as much as two-thirds of the original profile removed by cutting and grading. This complex has poor potential for most building purposes because of poor stability, with cuts and excavations becoming difficult to stabilize. Areas that have been graded or disturbed can be dangerous to build on. When under pressure, clay in this soil can squeeze out from under building foundations and footings causing settlement and cracks that can lead to significant building damage. Available water capacity is high in relatively undisturbed areas and low in Urban land cut and fill situations. In areas where it is unlimed, this soil is very strongly acid to extremely acid, posing a risk to the adjacent environment. This soil unit is located in the southeastern portion of the South Capitol Street Project Area.
- Urban Land-Sassafras Complex 0-8% slopes **(UxB)** consists of Urban Land and well drained Sassafras soils, which have been altered by grading for housing developments, shopping centers, industrial areas, and similar uses. Available water capacity is high in relatively undisturbed areas and low to very low in Urban land cut and fill situations. In areas where it is unlimed, this soil is very strongly acid to extremely acid, posing a risk to the adjacent environment. This soil has limited potential for building sites due to lack of space. Most projects occur where existing buildings have been removed. This soil unit is located in the northeast corner of the western region of the South Capitol Street Project Area.

2.5.4 Environmental Consequences

Geologically, there are no areas of important mineral resources or bedrock outcrops within the Project Area. Similarly, much of the topographic landscape has been manipulated for development, such as raised berms for highways and grading of topographic relief for the urban street grid. Of the 27 soil types found within the Project Area, 23 have erodible qualities.

2.5.4.1. FEIS Preferred Alternative

Construction of the FEIS Preferred Alternative would require grading of existing land surfaces for placement of new roadway components, primarily near the new Frederick Douglass Memorial Bridge approaches. On the west side of the Anacostia River, the northern edge of the traffic oval would be approximately equal to the existing elevation at Potomac Avenue. On the east side of the Anacostia River, the northern edge of the

proposed traffic circle is approximately 15 feet higher than the existing ground. The southern edge of the traffic circle is approximately equal to the existing elevation; however, it is nearly 15 feet lower than the existing northbound South Capitol Street elevation.

Eleven soil types are found within the limits of disturbance for the FEIS Preferred Alternative. Three soil types are considered not erodible, six potentially erodible, and two highly erodible. The locations of the two highly erodible soil types are along Howard Road SE in the eastern portion of the Project Area where construction impacts would be limited because the FEIS Preferred Alternative does not include widening of Howard Road SE.

Within the limits of disturbance, the soil type along the west shore of the Anacostia River is classified as Urban Land, varied erosion (Ub), while the east shore is comprised of Udorthents, varied erosion (U1) and Melvin Silt Loam, slight erosion (Mp). Topography is relatively flat in these areas and soil erosion during construction is anticipated to be minimal. The majority of the construction would occur in areas with an already high level of urban ground disturbance.

2.5.4.2. Revised Preferred Alternative

Construction of the Revised Preferred Alternative would require grading of existing land surfaces for placement of new roadway components, primarily near the new Frederick Douglass Memorial Bridge approaches. Both the west side and east side traffic ovals would require some grading, predominately using fill material.

A total of 13 soil types are found within the limits of disturbance for the Revised Preferred Alternative. Four soil types are considered not erodible, eight potentially erodible, and one highly erodible. The location of the highly erodible soil type is along Dunbar Road SE in the southern portion of the Project Area, where construction impacts would be limited because the Revised Preferred Alternative does not include improvements to Dunbar Road SE.

Within the limits of the disturbance, the soil type along the western shore of the Anacostia River is classified as Urban Land, varied erosion (Ub), while the eastern shore is comprised of Udorthents, varied erosion (U1) and Udorthents, Smoothed, varied erosion (U6). Topography is relatively flat in these areas and soil erosion during construction is anticipated to be minimal. In addition, the majority of the construction would occur in areas with an already high level of urban ground disturbance..

2.5.4.3. Mitigation

Best Management Practices (BMPs) and currently acceptable design and construction procedures would be used to reduce or eliminate anticipated undesirable effects, such as soil erosion, resulting from construction. Erosion control and stormwater management is required during construction through the NPDES permitting program. Adherence to District of Columbia and federal design criteria for the construction of roadways and bridges would eliminate the potential for long-term soil erosion due to the project.

2.6 Required Permits and Consultations

A variety of permits and consultations would be required for construction of the project. These authorizations assure that proper coordination pursuant to federal and District of

Columbia legislation has been satisfied. The anticipated permits and consultations for natural resources are discussed below.

2.6.1 Section 404 Clean Water Act

The USACE administers this program, which regulates the discharge of dredge and fill material in to waters of the United States, and includes streams and wetlands. Depending on final design, this project is likely to be permitted under a Nationwide USACE Permit (NWP 15: US Coast Guard Approved Bridges and NWP 14: Linear Transportation Projects).

2.6.2 Section 401 Water Quality Certification

Administered by the Water Quality Division of the District of Columbia Environmental Health Administration, this permit acknowledges the USACE issuance of the 404 permit and allows for the District of Columbia to add specific conditions to assure all water quality standards are meet.

2.6.3 Section 9 Rivers and Harbors Act

Administered by the USCG, this permit is required for construction of a new bridge over a navigable waterway. This permit ensures that appropriate horizontal and vertical clearances are met during design. It also requires prior issuance of the 401 Water Quality Certification and prior approval of the environmental document (for this project a Final Environmental Impact Statement and Record of Decision).

2.6.4 Section 10 Rivers and Harbors Act

This permit is administered by the USACE for any work in, over, or under navigable waters of the United States. After the submission of the formal permit application, the USACE will determine what type of permit is needed depending on the type of work proposed.

2.6.5 National Pollution Discharge Elimination System

This permit is required for stormwater discharge from construction sites. Administered by the USEPA Region III, this permit must also meet the DDOE water quality regulations. The DDOE must review and approve plans for stormwater management including sediment and erosion control practices.

2.6.6 FEMA 100-Year Floodplain

Project coordination is required with the DDOE, Watershed Protection Division to ensure that the development is consistent with the need to minimize or eliminate flood damage. The District of Columbia's program also coordinates most of its activities with the Federal Emergency Mangement Agency's (FEMA) National Flood Insurance Program (NFIP) and the USACE.

2.6.7 Endangered Species Act

Section 7 Endangered Species Act consultation with the NMFS regarding the federally endangered shortnose sturgeon (*Acipenser brevirostrum*) and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is necessary. Concurrence that the Project would have discountable impacts on the shortnose sturgeon, and is not likely to adversely affect the species, was received February 20, 2007. A similar ruling is being sought for the Atlantic sturgeon, and must be obtained prior to construction.

2.6.8 Migratory Bird Treaty Act

The USFWS administers this act. This law makes it illegal by any means or any manner to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755) as amended. A permit for removal and relocation of any osprey nest located on the existing Frederick Douglass Memorial Bridge pier will be necessary from the USFWS prior to bridge demolition.

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Supplemental Natural Resources Technical Report

Appendix A

Routine Wetland Delineation Data Sheets

May/June 2014

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: South Capitol Street Project City/County: Washington DC Sampling Date: 5/20/14
Applicant/Owner: DDOT State: MD Sampling Point: WET 1
Investigator(s): SS, MN, R Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 2-3
Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____
Hydric Soil Present?	Yes ✓	No _____
Wetland Hydrology Present?	Yes ✓	No _____

Is the Sampled Area within a Wetland? Yes ✓ No _____

Remarks:
Plot taken within disturbed swale, sediment deposits on top of hydric soil layer.
Photo 5 - looking down slope (South) from WET 1
Photo 6 - looking upslope (North) from WET 1

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ☐ Water Marks (B1)
- ✓ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes ✓	No _____	Depth (inches): 1"
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET 1

Tree Stratum (Plot size: irregular swale)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	8	✓	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	8 = Total Cover		
50% of total cover: 4	20% of total cover: 1.6		

Sapling/Shrub Stratum (Plot size: irregular swale)			
1. Ulmus pumila	10		FACU
2. Lonicera maackii	5		UPL
3. Fraxinus pennsylvanica	60	✓	FACW
4.			
5.			
6.			
7.			
8.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		

Herb Stratum (Plot size: irregular swale)			
1. Acer rubrum	5	✓	FAC
2. Rumex crispus	4		FAC
3. Ulmus pumila	6	✓	FACU
4. Fraxinus pennsylvanica	10	✓	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Woody Vine Stratum (Plot size: irregular swale)			
1. Lonicera japonica	15	✓	FACU
2. Parthenocissus quinquefolia	5	✓	FACU
3.			
4.			
5.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WET 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/2	70					SL	
	10YR 3/1	30						
2-14	10YR 5/3	80	7.5YR 4/4	20	C	M	SCL	
14-20*	10YR 4/1	90	7.5YR 4/6	10	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3) *
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

*Sand layer ⇒ sediment deposit from recent construction
Presence of sand/sediment causing hydric soil to begin further down in the soil profile

District Department of Transportation

appendix F

biological assessment of impacts to the Atlantic Sturgeon

july 2014

submitted by:

PARSONS BRINCKERHOFF

BIOLOGICAL ASSESSMENT OF IMPACTS TO THE ATLANTIC STURGEON (*ACIPENSER OXYRINCHUS OXYRINCHUS*)

SOUTH CAPITOL STREET PROJECT

REPLACEMENT OF THE FREDERICK DOUGLASS MEMORIAL BRIDGE OVER THE ANACOSTIA RIVER

DISTRICT OF COLUMBIA

Prepared For:
National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930-2298

Prepared By:
The District Department of Transportation
(On behalf of the Federal Highway Administration)
2000 14th Street, NW, 6th Floor
Washington, DC 20009 (202) 673-6813

Federal Highway Administration

July 2014

Introduction

The District of Columbia Department of Transportation (DDOT) is undertaking a Supplemental Final Environmental Impact Statement (SFEIS) for the South Capitol Street Project to account for potential impacts as a result of the design refinements that have been proposed since the 2011 FEIS. The project includes replacing the Frederick Douglass Memorial Bridge (FDMB), reconstructing connecting roadways and interchanges, and adding streetscape features. The FDMB on South Capitol Street is a major entrance into the Nation's Capital from the southeast, and this project will be a key to the Anacostia Waterfront Initiative project to revitalize the entire Anacostia waterfront area. It is located approximately 1.3 river miles above the mouth of the Anacostia River (**Figure 1**) and approximately one river mile downstream of the 11th Street Bridges.

Consultation Activities to Date

Project coordination with the National Marine Fisheries Service (NMFS) during preparation of the DEIS in 2006 indicated the potential occurrence of *Acipenser brevirostrum* (shortnose sturgeon) within the waters of the Anacostia River near the proposed bridge replacement project (**Appendix A**). The shortnose sturgeon is federally listed as endangered and recent surveys at that time, conducted by the U.S. Fish and Wildlife Service (USFWS), had documented the presence of shortnose sturgeon in the nearby Potomac River. A Biological Assessment (BA) addressing potential project impacts to shortnose sturgeon was prepared by the Federal Highway Administration (FHWA) during the fall of 2006. In a letter dated February 20, 2007 (See Appendix A), the NMFS concurred with the findings of the BA that the presence of shortnose sturgeon within the Anacostia River is unlikely and that any impacts to shortnose sturgeon from any activity associated with the project would be discountable.

On April 6, 2012, the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) was formally listed by the USFWS as an endangered species. Because the South Capitol Street project has initiated a SFEIS to address the Revised Preferred Alternative, FHWA and the DDOT are now examining potential project impacts to the Atlantic sturgeon. The requirement to complete this assessment was confirmed in correspondence from Christine Vaccaro of the NMFS dated August 16, 2013 (See Appendix A for this correspondence).

This revised BA identifies the Revised Preferred Alternative and includes information on the status of the Atlantic sturgeon within the project study area. The BA does not reevaluate potential impacts to shortnose sturgeon, as the elements of the bridge design and the conditions within the Anacostia River have not changed substantially from the original BA. The NMFS August 16, 2013 correspondence indicates that the assessment must be updated to address potential impacts to Atlantic sturgeon.

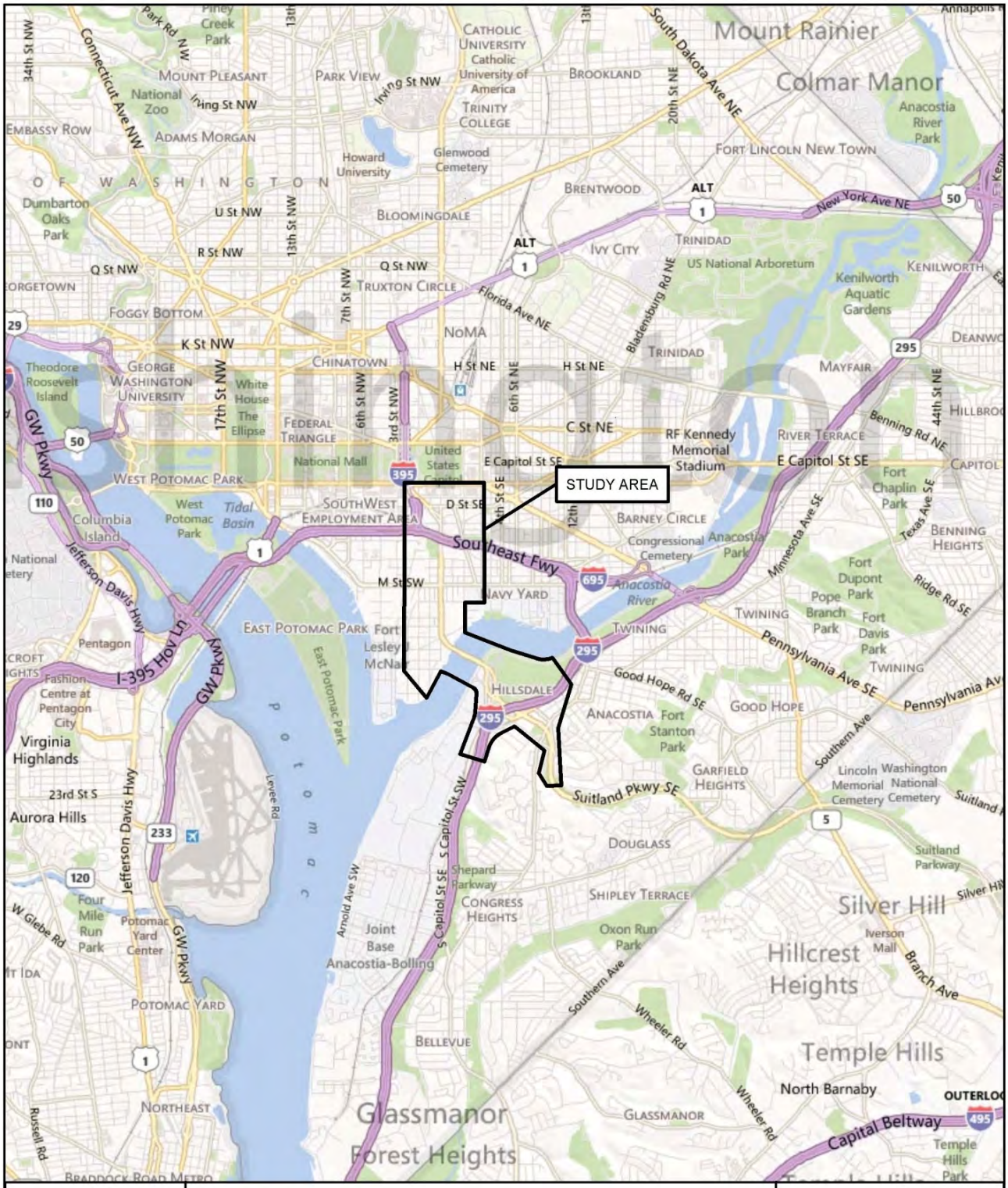


FIGURE 1: VICINITY MAP

SOUTH CAPITOL STREET PROJECT
WASHINGTON D.C.

OCTOBER 2013

COASTAL RESOURCES INC.

N W E S

SCALE: 1 in = 1 miles

Project Description: Revised Preferred Alternative

The Revised Preferred Alternative is comprised of 5 segments, as described below and shown in Figure 2. A description of each of the 5 segments is provided below.

- Segment 1 encompasses the Anacostia River and the land areas immediately on both the west (near the Nationals Ballpark and Buzzard Point) and east (near Anacostia and Poplar Point) ends of the river.

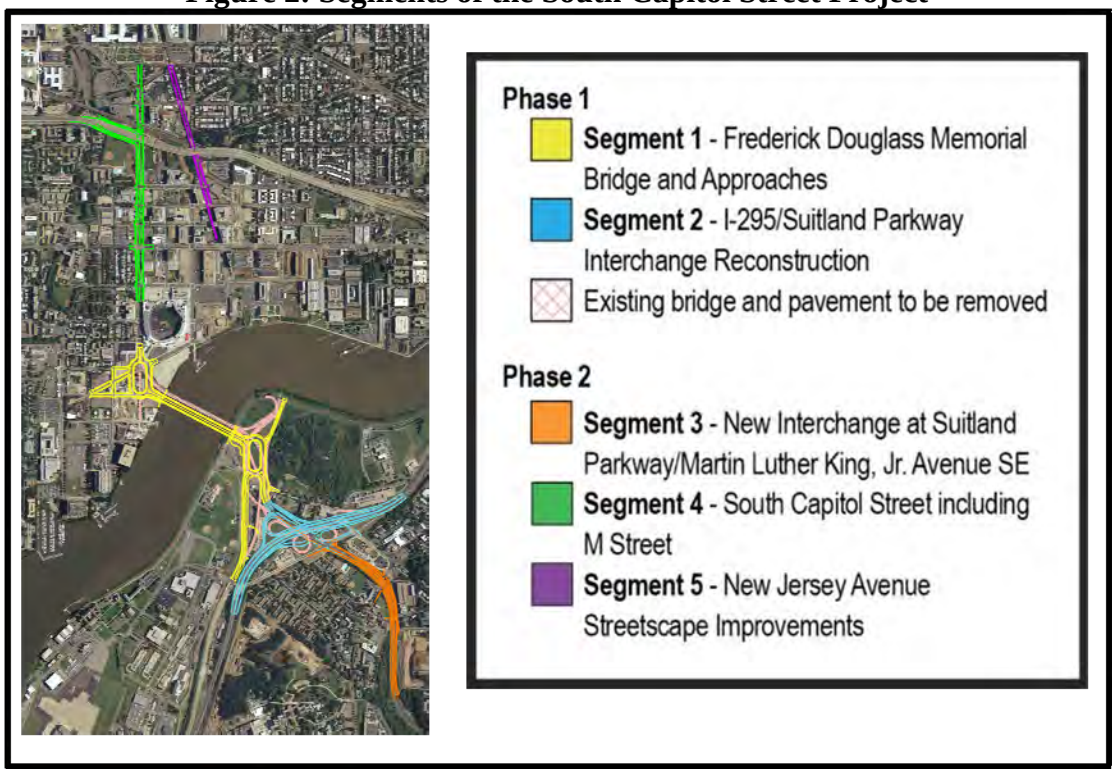
- Segment 2 encompasses I-295 and the area between South Capitol Street SE and Firth Sterling Avenue SE, including Suitland Parkway.

- Segment 3 includes Suitland Parkway from Firth Sterling Avenue SE east to just south of Stanton Road SE.

- Segment 4 includes South Capitol Street from N Street to D Street.

- Segment 5 encompasses the areas north of I-695 to Independence Avenue, but also includes New Jersey Avenue SE between M Street SE and Independence Avenue SE.

Figure 2: Segments of the South Capitol Street Project



The proposed project would be constructed in two phases. The first phase would include Segments 1 and 2, and the second phase will include Segments 3, 4 and 5. The demolition of the existing FDMB would be included in Phase 1. Currently, the procurement for the construction of Phase 1 is underway as a design build project. For the purposes of this study, the analysis will be focused on Segment 1 and primarily the replacement of the FDMB over the Anacostia River and the demolition of the existing FDMB, as described below and detailed in the definition of the Action Area at the end of this section.

Frederick Douglass Memorial Bridge

The proposed FDMB alignment of the Revised Preferred Alternative would be located parallel to and approximately 30 feet from the south side or downstream of the existing bridge. The replacement bridge would be a fixed span, meaning that passage of vessels with heights greater than the vertical clearance below the structure, approximately 42 feet, would no longer be allowed to pass. The 42 feet vertical clearance was based on the information collected for the Anacostia River Navigation Evaluation, which found that 99.9 percent of vessels require less than 42 feet vertical clearance. The decision to identify a Revised Preferred Alternative with a fixed span bridge was made because very few vessels navigating the river now and in the future require vertical clearances greater than what could be provided by a fixed span bridge.

Similar to the FEIS Preferred Alternative, the new proposed bridge associated with the Revised Preferred Alternative would support six travel lanes (three lanes in each direction), and bike/pedestrian paths. The bike/pedestrian paths would be located on opposite sides of the bridge, the same as what was proposed for the FEIS Preferred Alternative. However, each path would be approximately 18 feet wide, or two feet narrower than what was proposed in the FEIS. For each path, separate areas would be provided for cyclists and pedestrians. For cyclists, both paths would provide for two-way traffic.

Action Area

The action area for the South Capitol Street project includes all areas of potential effect; both direct and indirect (**Figure 3**). The specific limits include approximately 1,000 feet downstream of the proposed bridge crossing and 500 feet upstream of the existing FDMB. These limits were established based on the potential direct effects from shock waves from pile driving and demolition of the existing bridge and indirect effects from drift of suspended solids within this tidal portion of the Anacostia River.

COASTAL RESOURCES INC.

FIGURE 3: ACTION AREA MAP

SOUTH CAPITOL STREET PROJECT
WASHINGTON D.C.

OCTOBER 2013

LEGEND:

Action Area

Limit of Disturbance

N W E S

SCALE: 1 inch = 1,000 feet

Existing Conditions

Topography

The entire South Capitol Street project area is located within the Coastal Plain physiographic province. Topography in the project area is relatively flat with elevations ranging from zero to 25 feet above sea level. The highest elevations are located in the eastern and western-most portions of the project area, along Interstate-295 (I-295) and surrounding the Capitol building. The lowest elevations are along the Anacostia River. Much of the topographic landscape has been altered for development, such as raised berms for highways and grading of topographic relief for the urban street grid.

Bathymetry of the Anacostia River

Anacostia River depths adjacent to the existing FDMB are shown in the bathymetry study completed for the Anacostia River in 2012 (**Figure 4**). Bottom depths along both shores just south of the existing bridge drop off quickly to about 15 feet. Depths then increase to about 20 feet within the approximately 300-foot wide navigation channel within the middle of the river.

Water Quality

The Anacostia watershed (Federal Hydrologic Unit Code (HUC) 02140205) extends north through the eastern portion of the District of Columbia into Montgomery and Prince George's counties in south central Maryland. The watershed originates within the eastern Piedmont physiographic province and drains across the Fall Line to the western Coastal Plain province. The Anacostia watershed drains 176 square miles comprising mainly urban and suburban land.

The District of Columbia Department of the Environment (DDOE) has a fixed daily monitoring station on the Anacostia River just upstream of the existing FDMB (South Capitol Street/Nationals Stadium Station). Water quality data from the monitoring station were available for most months from 2008 through 2012 for dissolved oxygen (DO), temperature, and salinity. Mean values from 2012 and historical ranges are listed below in ***Table 1***.

Figure 4

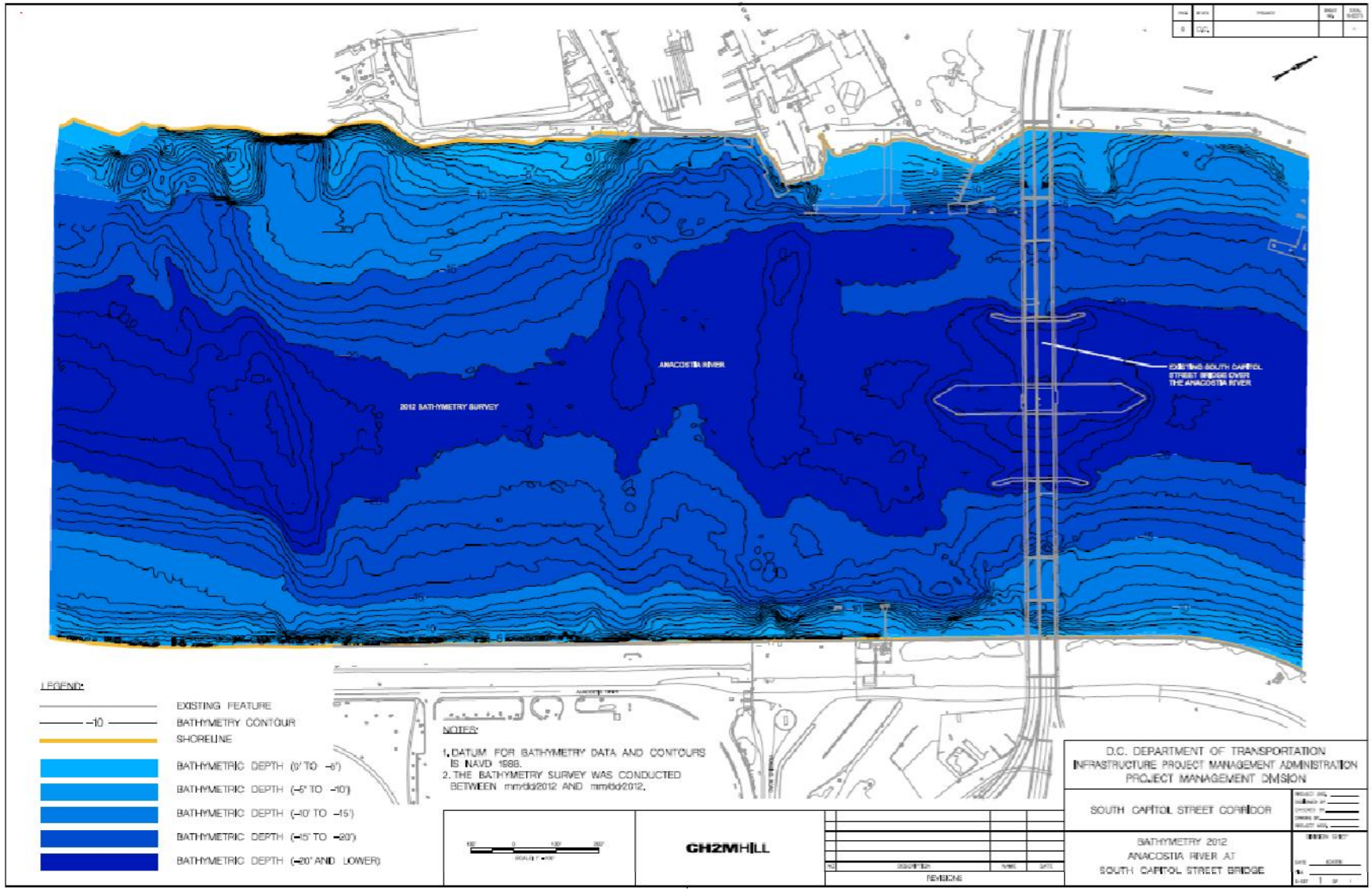

ANACOSTIA RIVER
2012 BATHYMETRY SURVEY
EXISTING SOUTH CAPITOL STREET BRIDGE OVER THE ANACOSTIA RIVER
LEGEND:
EXISTING FEATURE
-10
BATHYMETRY CONTOUR
SHORELINE
BATHYMETRIC DEPTH (0' TO -5')
BATHYMETRIC DEPTH (-5' TO -10')
BATHYMETRIC DEPTH (-10' TO -15')
BATHYMETRIC DEPTH (-15' TO -20')
BATHYMETRIC DEPTH (-20' AND LOWER)
NOTES:
1. DATUM FOR BATHYMETRY DATA AND CONTOURS IS NAVD 1988.
2. THE BATHYMETRY SURVEY WAS CONDUCTED BETWEEN mm/dd/2012 AND mm/dd/2012.
CH2MHILL
REVISIONS
D.C. DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION
SOUTH CAPITOL STREET CORRIDOR
BATHYMETRY 2012
ANACOSTIA RIVER AT
SOUTH CAPITOL STREET BRIDGE

Table 1. Water Quality Monitoring Results for the Anacostia River at the South Capitol Street/Nationals Stadium Station.

Monitoring Station Anacostia River South Capitol Street at Nationals Stadium												
	Dissolved Oxygen (mg/L)				**Temperature (°C)**				**Salinity (ppt)**			
Month	**Min.**	**Mean**	**Max**	**2012[1]**	**Min.**	**Mean**	**Max**	**2012[1]**	**Min.**	**Mean**	**Max**	**2012[1]**
January	8.81	10.98	13.05	-	0.61	7.68	20	-	0.18	0.32	0.62	-
February	10.67	12.27	13.90	-	3.63	4.92	7.52	-	0.20	0.34	0.57	-
March	5.79	9.26	13.77	7.87	3.93	9.91	14.23	15.44	0.12	0.21	0.67	0.16
April	1.98	7.44	12.56	7.37	6.08	15.28	21.74	15.92	0	0.17	0.24	0.17
May	1.49	6.14	12.06	5.14	11.87	19.70	26.68	21.82	0.06	0.14	0.21	0.15
June	0.18	4.34	14.20	4.54	18.97	26.17	31.02	25.48	0.07	0.14	0.18	0.12
July	0.31	5.85	15.34	4.01	25.16	28.48	31.99	29.15	0.07	0.16	0.19	0.14
August	0.22	4.32	13.66	2.93	22.76	27.73	31.11	28.02	0.01	0.15	0.19	0.15
September	0.36	5.14	15.51	3.97	20.25	23.49	29.26	24.58	0	0.15	0.21	0.14
October	0	5.88	10.36	5.49	10.03	17.18	22.28	18.21	0.01	0.14	0.19	0.15
November	2.32	7.22	11.53	8.51	6.39	11.31	15.78	7.08	0.09	0.16	0.20	0.16
December	5.72	8.81	14.74	8.81	-0.92	6.98	12.91	6.69	0.01	0.15	1.24	0.17

Source: District Department of Environment/District Rivers Monitoring Program (accessed 9/23/13)

[1]Mean

Range of data- 2008 to 2011

Water quality parameters were measured from 2008 to present, creating a historical reference range for the monitoring site. The 2012 readings were excluded from this range for comparison. DO, water temperature, and salinity fluctuate seasonally in the Anacostia River as shown in the data tables above. The 2012 readings were generally within the historical ranges, falling outside only for temperature in March, where the 2012 March average temperature was higher than the maximum for the 2008 through 2011 range. Also, the mean monthly temperatures for 2012 exceeded the 2008 through 2011 mean temperatures in all months except June, November, and December. DO measurements taken in 2012 were below average for all months except June and November. The lowest monthly average DO measurements taken in 2012 were recorded in August and September with readings of 2.93 milligrams/liter (mg/L) and 3.97 mg/L, respectively. Average monthly salinity measurements in 2012 are similar to the longer term averages for those months, ranging from 0.12 to 0.17 parts per thousand (ppt). These values fall within the tidal freshwater range.

The Virginia Institute of Marine Sciences (VIMS), in coordination with the National Oceanic and Atmospheric Administration (NOAA), Virginia Department of Environmental Quality, Maryland Department of Natural Resources, and the Virginia Coastal Zone Management Program, documents the presence of submerged aquatic vegetation (SAV) within the Chesapeake Bay Watershed on a yearly basis (mid-1990s to present). Aerial photography is used to document SAV bed locations, size, and species present. These data are then used to develop trends, identify areas of decline and abundance, and implement preservation strategies. Historical SAV mapping, from 1994 to present, was reviewed to determine the extent of SAV

beds within the Anacostia River and immediate vicinity of the FDMB. According to results presented by VIMS on their SAV web site (http://www.vims.edu/bio/sav), no SAV beds were observed within the tidal portion of the Anacostia River. SAV surveys of the tidal Anacostia River within the District of Columbia are conducted annually by the Fisheries and Wildlife Division (FWD) of the DDOE. Surveys are conducted from a slow moving boat driven along the shorelines and SAV are documented by visual observation and rake sampling. All of the shoreline areas of the Anacostia River that are contained within the District of Columbia were surveyed for SAV. The results of this effort indicated that no SAV was observed in the Anacostia River in 2012 (DDOE 2013). DDOE reports that no observable SAV has been present in the Anacostia River since 2002 (Daniel Ryan personal communication August 27, 2013).

The Anacostia River has had a long history of contamination from human activities such as development, waste disposal, and hazardous materials. The BA completed for the 11th Street Bridges project (CH2M HILL 2006) references information on contaminants collected by the District of Columbia Department of Health (DCDOH), Metropolitan Washington Council of Governments, and others. The report discusses contaminants within bottom sediments and degraded water quality of the Anacostia River as it relates to the potential presence of Atlantic sturgeon within the Anacostia River.

Status of Atlantic Sturgeon in the Potomac River

The Atlantic sturgeon was once an abundant fish resource along the Atlantic coast, ranging from Hamilton Inlet along the Atlantic coast of Labrador to at least the St. Johns River in Florida (Smith 1985). Atlantic sturgeon served as an important commercial fishery during colonial and post Civil War days (Smith 1985). By 1890, the Chesapeake Bay Atlantic sturgeon fishery peaked at 726,036 pounds, but fell rapidly after the turn of the twentieth century to a harvest of only 22,898 pounds in 1920 (Murdy et al. 1997). Through this period and into the late twentieth century, declines in the Atlantic sturgeon fishery continued in the Chesapeake Bay and throughout its range with reasons for the decline being directly attributable to human impacts, including over-harvesting, construction of dams on spawning rivers, and pollution from industrial and domestic sources (Smith 1985).

In 1997, the NMFS added the Atlantic sturgeon to its candidate species list (later Species of Concern list). A status review of the Atlantic sturgeon was completed by the NMFS in 1998, but the species was not determined to meet the criteria for listing at that time. During this same period, the Atlantic States Marine Fisheries Commission completed an amendment to the 1990 Atlantic Sturgeon Fishery Management Plan that imposed a 20-40 year moratorium on all Atlantic sturgeon fisheries (ASSRT 2007). In 2003, the NMFS again began a review of the status of the Atlantic sturgeon. The results of the review were published in 2007 (ASSRT 2007). In 2010, the NOAA proposed listing the Atlantic sturgeon under the Endangered Species Act. The final listing was published in the Federal Register (50 CFR parts 223 and 224) on February 6, 2012 and became effective on April 6, 2012. Five Distinct Population Segments (DPS) were identified in the listing, including the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic. The Gulf of Maine DPS was listed as threatened, while the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPS were listed as endangered.

Mitochondrial DNA studies of Atlantic sturgeon taken from the Chesapeake Bay indicate the presence of a resident Chesapeake Bay population and migrant sturgeon from the Delaware Bay and Hudson River sub-populations of the New York Bight DPS (King et al. 2001).

Historically, Atlantic sturgeon were common within the Chesapeake Bay and they are believed to have spawned within most of the major rivers of the Bay, including the Potomac River (ASSRT 2007). However, following the 1998 moratorium on fishing for Atlantic sturgeon, few sturgeon were reported as bycatch by commercial fisherman in Maryland waters of the Chesapeake Bay, though anecdotal evidence from fishermen indicated that Atlantic sturgeon were more abundant than sparse bycatch reports would indicate (Mangold et al. 2007). In 1992, the Maryland Fishery Resources Office (MFRO) and USFWS initiated a coast-wide sturgeon tagging program designed to coordinate sturgeon tagging and research efforts across several Atlantic states. A smaller tagging program was started in Maryland to gather detailed data on Atlantic sturgeon in Maryland waters. From 1994 to 1996, the MFRO sought live sturgeon from commercial fishermen in the Maryland portion of the Chesapeake Bay. Only two Atlantic sturgeon were reported to the program over those two years. In 1996, the MFRO initiated a reward program to provide a monetary incentive to commercial fisherman for turning in live sturgeon captured during fishing operations. This incentive substantially increased the number of sturgeon supplied to the program. Also in 1996, the MFRO released approximately 3,000 hatchery-reared Atlantic sturgeon in the Nanticoke River (Mangold et al. 2007, Secor et al. 2000). These juvenile Atlantic sturgeon were individually tagged, and the reporting of these hatchery-reared Atlantic sturgeon was encouraged through their inclusion in the sturgeon reward program. The award program was continued through April 2012 when the Atlantic sturgeon endangered species listing took effect.

The number of Atlantic sturgeon reported during the more than 16 years of the sturgeon reward program included 1,590 wild adult Atlantic sturgeon and 463 hatchery-reared juvenile Atlantic sturgeon (USFWS 2013). **Figure 5** shows the capture locations of adult Atlantic sturgeon reported between 1996 and 2012, while **Figure 6** depicts the capture locations of hatchery-reared juvenile Atlantic sturgeon through that same period (USFWS 2013). Numerous wild Atlantic sturgeon were caught within the Potomac River; however, only eleven (11) were documented above the Harry Nice Bridge crossing of US 301. Significantly fewer juvenile Atlantic sturgeon were captured within the Potomac River, and only one capture occurred above the Harry Nice Bridge crossing. No Atlantic sturgeon have been reported within the Anacostia River or within the Potomac River above Indian Head, some 23 miles downriver of the FDMB.

As described above, historical reasons for Atlantic sturgeon declines were attributed to over-harvesting, the construction of dams, and pollution. Current Atlantic sturgeon impacts occur through alterations of foraging and spawning habitat from dam construction and operation, dredging and disposal, water quality modifications, and vessel strikes (ASSRT 2007). Dams can directly affect Atlantic sturgeon by cutting off spawning habitat, altering flow regimes, and releasing excess sediment that can bury sturgeon spawning or foraging habitats. However, within the Chesapeake Bay DPS, dams are not thought to be a significant threat to Atlantic sturgeon, as few dams exist within the known or historic spawning areas of the Chesapeake Bay rivers (ASSRT 2007).

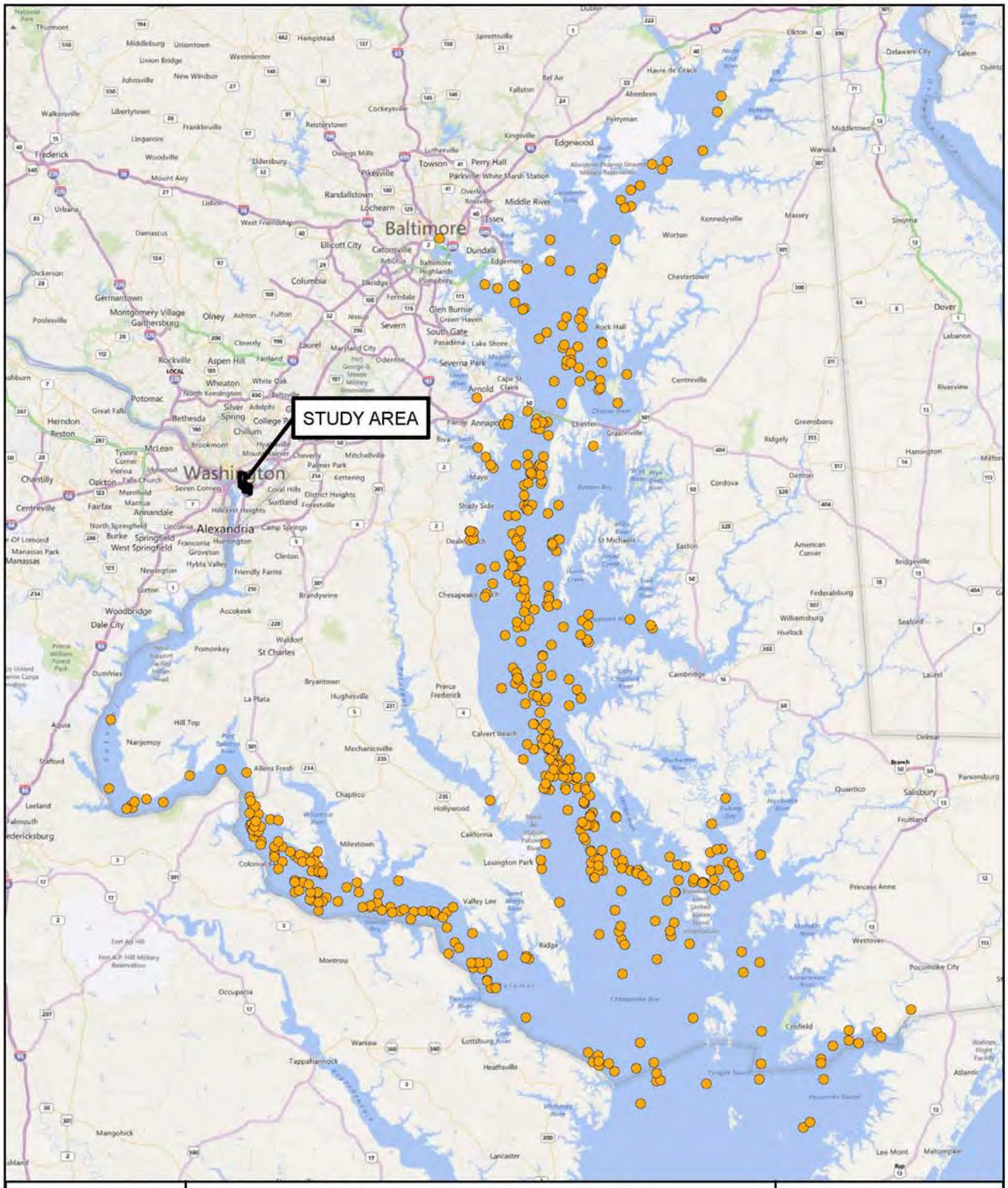


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FIGURE 5: CAPTURE LOCATIONS OF WILD ATLANTIC STURGEON (1996-2012)

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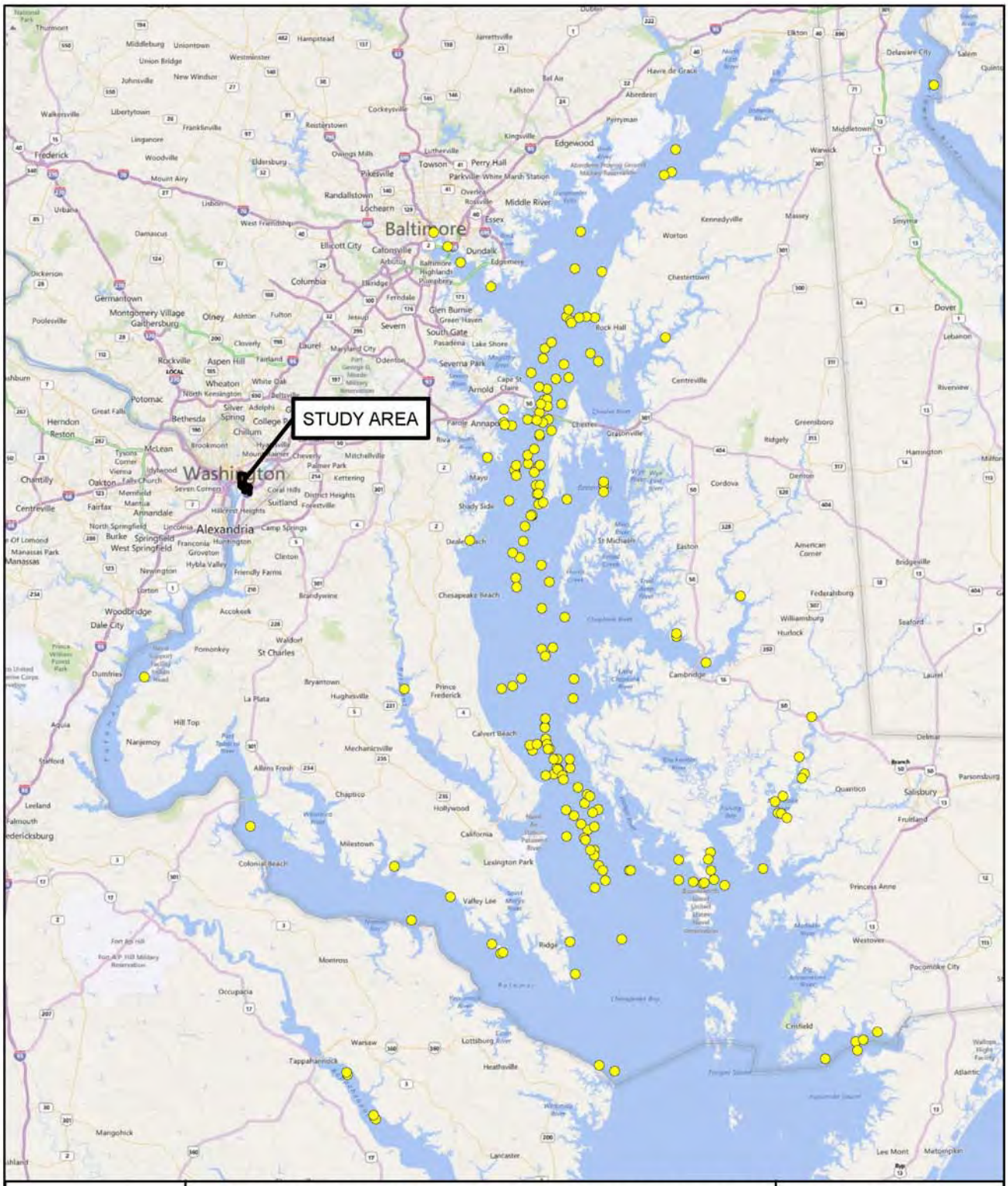

COASTAL RESOURCES INC.

FIGURE 6: CAPTURE LOCATIONS OF HATCHERY-REARED WILD ATLANTIC STURGEON (1996-2012)

SOUTH CAPITOL STREET PROJECT
WASHINGTON D.C.

OCTOBER 2013

Dredging operations pose significant threats to Atlantic sturgeon habitat through the disturbance of bottom sediments, removal of spawning substrates, and disruption of macroinvertebrate communities (ASSRT 2007). In a study in the St. Lawrence River in Canada, Atlantic sturgeon avoided areas of dredged sediment dumping (McQuinn and Nellis 2007). Hydraulic dredging operations have also been shown to directly cause mortality of Atlantic sturgeon (ASSRT 2007).

Poor water quality is thought to contribute to the slow recovery of Atlantic sturgeon within the Chesapeake Bay (ASSRT 2007). In a study within the Chesapeake Bay, low Atlantic sturgeon abundance was correlated with decreasing water quality resulting from increased nutrient loading and increased spatial and temporal frequencies of hypoxic (low DO and high temperature) conditions (Secor 1995, Niklitschek and Secor 2005). However, some evidence suggests that water quality has not degraded everywhere within the Chesapeake Bay to the point where sturgeon can no longer be supported. For example, captures of hatchery-reared Atlantic sturgeon in subsequent years following their 1996 release in the Nanticoke River indicated survival and growth rates that suggest the availability of suitable foraging habitat in the Bay (Secor et al. 2000, Welsh et al. 2002). Direct and indirect effects from these various sources can be avoided or minimized during bridge construction through the use of approved dredging techniques, cofferdams during in-stream construction, and adherence to approved stormwater management practices.

Habitat Suitability

Atlantic sturgeon throughout their range along the Atlantic Coast have similar life history strategies as shortnose sturgeon (Shepherd 2006), but tend to use saline waters more as adults compared to shortnose sturgeon (Smith 1985, Collins et al. 2000, Niklitschek and Secor 2010, Fernandes et al. 2010). Pre-spawning adults begin migrations in February in southern populations, April in the Chesapeake Bay and Delaware Bay populations, and May-June in the Gulf of Maine and Gulf of St. Lawrence populations (Smith 1985, Smith & Clungston 1997). Fall spawning has been documented in southern populations and recent evidence was presented by researchers from the Virginia Commonwealth University of fall spawning occurring within the James River in the Virginia portion of the Chesapeake Bay (Virginia Commonwealth University 2012). Spawning habitat is similar to that of shortnose sturgeon and is identified as hard substrates including rock, rubble, gravel (Smith 1985) that lies between the saltwater/freshwater interface and the fall line of large rivers (ASSRT 2007).

Foraging habitat of juvenile and subadult Atlantic sturgeon is typically within the freshwater/saltwater interface of tidal rivers (Collins et al. 2000, Secor et al. 2000, Guilbard et al. 2007, ASSRT 2007). Atlantic sturgeon are bottom feeders, consuming a wide variety of benthic prey. Prey items reported in the diet of Atlantic sturgeon include crustaceans, mollusks, amphipods, polychaete and oligochaete worms, insect larva, fish, and gastropods (ASSRT 2007, Guilbard et al. 2007). In the St. Lawrence River, young-of-year (YOY) Atlantic sturgeon were found to consume mostly gammarid amphipods, while juvenile and subadult sturgeon fed mainly on oligochaete worms (Guilbard et al. 2007). Other prey items consumed by subadults included small fish, mollusks, and insects (Guilbard et al. 2007). Gut contents of juvenile hatchery-reared Atlantic sturgeon released into the Chesapeake Bay and later recaptured through a fishery

dependent reward program, contained mostly annelid worms with lesser amounts of isopods, amphipods, chironomid larvae, and mysids (Secor et al. 2000).

The physical tolerances of Atlantic sturgeon also vary by life stage and range. As noted above, YOY typically remain in freshwater portions of rivers and juveniles and subadults occur in the saltwater/freshwater interface. Some subadults and most adults enter the marine environment outside the spawning period, and may undergo coastal migrations (Smith and Clungston 1997, Secor et al. 2000). Laboratory studies on juvenile Atlantic sturgeon have demonstrated lethal effects under hypoxic conditions (low DO and high temperature), with nearly 100 percent mortality of sturgeon exposed to water temperatures of 26° Celsius (C) and DO levels of 3 mg/L (Secor and Gunderson 1998). Another laboratory experiment documented behavioral responses of YOY Atlantic sturgeon to varying combinations of water temperature, salinity, and DO (Niklitschek and Secor 2010). Results of the study showed that YOY Atlantic sturgeon avoided hypoxic conditions (DO = 40% and water temperatures of 28°C) and preferred salinities of 8‰. These laboratory data showed agreement with inferred habitat preferences of juvenile Atlantic sturgeon captured in the wild (Niklitschek and Secor 2010).

Potential Occurrence

The Atlantic sturgeon is not known to occur within the project study area. As described above, of the 1,590 wild and 463 hatchery-reared juvenile Atlantic sturgeon captures in the Chesapeake Bay, only 11 wild and one hatchery-reared sturgeon were captured in the Potomac River above the Harry Nice Bridge crossing of US 301. All but a few of the captures was within mesohaline waters and no captures occurred within tidal freshwater areas.

Based on this life-history information and knowledge of the habitat conditions within the Anacostia River, some assumptions can begin to be made as to the likelihood that Atlantic sturgeon would be within or passing through the South Capitol Street/FDMB project area at any given time of the year. The Anacostia River and its tributaries generally lack suitable spawning areas for sturgeon, reducing the likelihood that Atlantic sturgeon are moving up the Anacostia River to spawn. Lack of spawning Atlantic sturgeon would also eliminate the possibility of YOY moving back downstream through the project area. Therefore, the only likely scenario for Atlantic sturgeon to be present within the Anacostia River would be juvenile fish seeking suitable foraging habitat.

A benthic macroinvertebrate sampling effort was conducted in a 2005 study within the Anacostia River, just upriver from the FDMB. The most commonly encountered macroinvertebrate species collected included oligochaete worms, gastrapod snails, pelecypod clams, and chironomid midge flies (Horne Engineering Services 2005). Worms and midge flies were the only taxa found within all sample locations. As described above, no SAV habitat exists within the tidal portions of the Anacostia River, further indicating poor foraging habitat conditions. These results suggest that suitable prey for juvenile sturgeon exists within the Anacostia River, though quantities of available macroinvertebrates and area of suitable foraging habitat may be low.

Water quality parameters in the Anacostia River likely do not limit the potential for Atlantic sturgeon to be present within the project study area. As presented in the Existing Conditions

section, mean historic DO levels during the summer months (June, July, and August) are over 4.3 mg/L, though the most recent data from 2012 had a reading in August of just under 3 mg/L. Water temperature also generally falls within the acceptable range for Atlantic sturgeon except for the warmest periods during summer months. However, Atlantic sturgeon would likely seek out deeper water refuges in summer to avoid thermal and anoxic stress. Water depths at the FDMB exceed 20 feet in the deepest part of the channel. These deeper channel areas could be used by juvenile Atlantic sturgeon during stressful summer water quality conditions.

Based on available scientific data and the general lack of suitable spawning and foraging habitat for Atlantic sturgeon in the Anacostia River, it is unlikely that these fish would be found within the action area of the South Capitol Street/FDMB project during any time of the year.

Conservation Measures

Bridge Demolition

Demolition of the old FDMB will be accomplished using non-blasting techniques such as diamond wire sawing, expandable epoxy, or hydraulic splitting. These non-blasting techniques were recommended by the NMFS for the WWB (PCC 2000). During bridge demolition and bridge construction, no dredging will be required, further reducing the potential disturbance to stray Atlantic sturgeon in the Anacostia River.

Technical Impact Reduction Techniques

These are techniques that can be used to reduce the pressure wave from pile driving or to repel potentially impacted fish from the immediate area. Impact reduction techniques such as scare charges, physical barriers (e.g., cofferdams), and bubble curtains described in the BAs for the WWB (PCC 2000, 2003) will be used to mitigate potential impacts from pile driving during construction of this project. Turbidity curtains may also be used around pier construction to provide a physical barrier between pile driving activities and fish. These curtains would also act to contain suspended solids from leaving the construction site.

Cofferdams will be the likely technique used to reduce the shock wave from pier construction on this project. However, as was discovered during construction of the WWB, shock waves resulting in fish kills are still possible depending upon the force of the pile driving, depth of the water, substrate, and size of the piles (PCC 2003). If piles larger than 66 inches in diameter will be needed for construction of the FDMB, then consideration will be given to using cofferdams in conjunction with bubble curtains to reduce shock waves in the surrounding water to below six pounds per square inch (PSI), the cutoff pressure at which the WWB noted fish kills.

Analysis of Effects on Atlantic Sturgeon

Direct and Indirect Effects

Direct effects of the project on Atlantic sturgeon seem unlikely since the likelihood of sturgeon being present in the action area is extremely low. As indicated above, the availability of foraging and spawning habitat for adults is absent from the Anacostia River. While extremely unlikely, the possible occurrence of Atlantic sturgeon in the action area is from transient adults that may wander into the Anacostia River from the Potomac River during spring (March 1 through April 30) spawning runs. To reduce the chances of impacts to sturgeon during this time period, conservation measures outlined above, including the use of cofferdams and avoidance of underwater blasting techniques and dredging, will further reduce the possibility for direct impacts to Atlantic sturgeon.

The secondary impacts to sturgeon that could occur from degradation of water quality during demolition and construction will also be reduced through use of the conservation measures described above. For this reason, the project is not expected to have negative effects on water quality. Likewise, the project is not expected to affect Atlantic sturgeon habitat, as habitat is not available within the Action Area.

Cumulative Effects

No other non-federal projects along the Anacostia River are known at this time.

Conclusions

The South Capitol Street project will include replacement of the FDMB over the Anacostia River. The replacement bridge would be aligned slightly downstream from the existing bridge. The Revised Preferred Alternative proposes a fixed span bridge with a 42-foot clearance for boat traffic, and would likely be built using four piers. The existing FDMB would also be demolished.

For the construction of the new bridge, it is anticipated that dredging would not be required and the new pier construction would likely occur within cofferdams. Bridge demolition would likely occur by first removing the pavement and deck, followed by the superstructure. Demolition would incorporate non-blasting techniques.

There are no known records of the Atlantic sturgeon within the Anacostia River. The nearest record of Atlantic sturgeon within the Potomac River is downstream of Indian Head. Habitat for Atlantic sturgeon in the Anacostia River is much poorer than in the Potomac River. The likely possible occurrence of Atlantic sturgeon in the Anacostia River would be transients during spawning runs between March 1 and April 30.

Conservation measures will be incorporated into the bridge construction and demolition of the old bridge to minimize potential impacts to sturgeon and other fishes. These measures will include techniques used by the WWB Project (use of bubble curtains) to reduce potential impacts to sturgeon and other fishes from shock waves associated with pile driving, cofferdam installation, and bridge demolition.

Determination of Effect

FHWA has determined, based on the best available scientific and commercial data and professional judgment, that the construction of the FDMB, as part of the South Capitol Street project, is not likely to adversely affect the federally listed endangered Atlantic sturgeon based on discountable effects.

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APPENDIX A

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Habitat Conservation Division
904 South Morris Street
Oxford, Maryland 21654

July 7, 2005

Bridgette Grillo
Coastal Resources, Inc.
2988 Solomons Island Road
Edgewater, Maryland 21037

Dear Ms. Grillo:

This concerns your request for National Marine Fisheries Service (NMFS) comments on the proposed improvements to South Capitol Street, and replacement of the Frederick Douglass Memorial Bridge in southeast and southwest Washington, D.C. Our staff was unable to attend the June 8, 2005 meeting at the Reeves Municipal Building in D.C. because of a schedule conflict. However, our office does cover D.C., and we do have resource concerns with this proposal.

Our primary concerns will pertain to the replacement of the Douglass Memorial Bridge crossing of the Anacostia River. The lower Anacostia River is a documented spawning ground and migratory corridor for several species of anadromous fish, including alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), hickory shad (*Alosa mediocris*), and white perch (*Morone americana*) (O'Dell et al., 1975). These species are annually present in the lower Anacostia River during the period of early March to mid-June. Bridge replacement will require activities that have the potential to disturb migrating adults and juveniles, and result in mortality of eggs and larvae. This project also could displace instream and riparian habitats that are critical to the life cycles of these species. We recommend that the proposed Environmental Impact Statement (EIS) address the following issues pertaining to the proposed bridge replacement.

1. The EIS should document whether sensitive instream and riparian habitats occur in the vicinity of the existing bridge, and in areas where a replacement bridge may be constructed. For example, beds of submerged aquatic vegetation (SAV) have been documented by the Virginia Institute of Marine Science (VIMS) aerial SAV surveys in the lower Anacostia River back to the early 1990s. While the VIMS surveys demonstrate the potential occurrence of SAV in the crossing area, only ground truth surveys can accurately determine whether this habitat type will be at risk from project activities. Therefore, spring and summer SAV surveys should be made of the river where project activities are likely to occur. Surveys should be conducted by personnel with relevant experience, and focus on SAV distribution, crown cover or density, SAV species, and local bathymetry. Data from the surveys should be transferred to maps presented in the EIS, which show SAV distribution relative to the existing bridge and replacement bridge alignments.

   The EIS should also document habitat types that occur in the riparian zone of the project area, and whether important species types, such as native trees and shrubs and fringe marsh, are present.

2. If the replacement bridge will be situated on an alignment that differs from that of the existing bridge, the EIS should investigate alternative alignments that will avoid or minimize impacts to sensitive instream and riparian habitats. Alternative alignments that avoid crossing areas where SAV beds and/or riparian vegetation is most extensive (i.e., where shading impacts and direct displacement of vegetation will be greatest) should be included in the analysis. Also, a bridge design should be selected that will minimize the number of instream piers.

3. The EIS should address measures that can be taken during construction within instream and riparian areas that will minimize impacts to anadromous fish and important aquatic habitats. Types of construction activities that are of primary concern include:

a) Actions that re-suspend fine-grain sediments into the water column, such as dredging, piling and cofferdam removal from the sediment, tug/barge abrasion of bottom sediments, jetting of structures into position, and flushing of sediments and other contaminants into the waterway from construction vessels.

b) Actions that produce heavy underwater shock waves, such as subaqueous blasting (i.e., should the existing bridge be demolished), and driving of large pilings into position, which kill and injure finfish.

c) Actions that permit erosion of soil and/or stock-piled materials into the waterway.

d) Blockage of the waterway (i.e., by temporary structures, vessels, etc.) that inhibits movements of instream fauna.

e) Unnecessary removal or damaging of large trees that provide shade for the waterway.

The following are measures that should be investigated for avoiding/minimizing impacts from the above actions.

a) Restricting instream work, including demolition activities to the period of October 16 through February 15, of any year, to protect anadromous fish migratory, spawning and nursery activities (February 15 - June 15), and SAV during the period optimal for its growth and reproduction (April 15 – October 15).

b) Use of measures that will mitigate the pressure level and carrying distance of underwater shock waves generated by pile driving and subaqueous blasting.

c) Best Management Practices

d) Limiting the presence of structures and/or vessels that may block instream fauna movements to less than ½ the width of the waterway at any time.

e) Marking and buffering (from construction activities) important riparian shade trees.

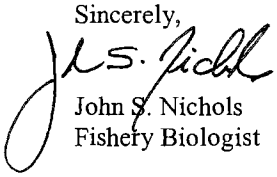
f) Properly disposing of cleanings (from equipment, vessels, structures removed from sediments) at an upland location.

Protected Resources Issues

NMFS has determined that the endangered shortnose sturgeon (*Acipenser brevirostrum*) is present in the upper tidal Potomac River. Consequently, individuals of this species may occur in the lower Anacostia River. We, therefore, recommend that you contact Sara McNulty of our Protected Resources Division staff in Gloucester, MA; (978) 281-9328, ext. 6520; to determine your requirements for Section 7 Consultation under the Endangered Species Act.

If you have any questions, or additional information needs, please contact me at (410) 226-5606, or John.Nichols@NOAA.GOV.

Sincerely,



John S. Nichols
Fishery Biologist

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

FEB 20 2007

Mark Kehrli
US Department of Transportation
Federal Highway Administration
District of Columbia Division
1990 K Street NW, Suite 510
Washington, DC 20006-1103

Re: HAD-DC

Dear Mr. Kehrli,

This is in response to your letter dated December 6, 2006 requesting consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, regarding the South Capitol Street/Frederick Douglas Memorial Bridge Project. The District of Columbia's Department of Transportation (DC DOT) in cooperation with the Federal Highway Administration (FHWA) proposes to replace the Frederick Douglas Memorial Bridge which crosses the Anacostia River. This bridge is located approximately 1.3 river miles from the confluence of the river with the Potomac River.

The federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is known to be present in the Chesapeake Bay. During the 1996-2005 time period, the incidental capture of seventy-two different shortnose sturgeon in the Chesapeake Bay and its tributaries had been reported via the US Fish and Wildlife Service Atlantic sturgeon reward program. This number includes eight shortnose sturgeon captured incidentally in fishing gear in the Potomac River. Additionally, researchers conducting a survey for shortnose sturgeon in the river captured one mature egg bearing female in September 2005 and an additional mature egg bearing female in the same location in March 2006. Both fish have been outfitted with sonic tags and are being actively tracked by researchers. Information available to date indicates that these fish have remained within the Potomac River since they were tagged. The female caught in September overwintered in the Potomac River near Mattawoman Creek. One of the females was documented at the presumed spawning grounds near Little Falls in the spring of 2006. The occurrence of pre-spawning females in the Potomac River suggests that a spawning population of shortnose sturgeon continues to exist in this river system. No shortnose sturgeon have been documented in the Anacostia River. However, shortnose sturgeon in other river systems have been documented foraging in tributaries to the mainstem river and if suitable habitat and forage items exist, shortnose sturgeon may be present in the Anacostia River.

The confluence of the Anacostia River with the Potomac River is located approximately 9 miles downstream of the Little Falls Dam and approximately 25 miles upstream of the location where the two female shortnose sturgeon have spent most of their time since being tagged (near the mouth of Mattawoman Creek). Although the population dynamics and migration patterns of shortnose sturgeon in the Potomac River have not been documented, based on patterns of habitat usage in other river systems, NMFS believes that the region of the river where the Anacostia River is located is used as a migratory pathway for adult shortnose sturgeon traveling to and from upstream spawning grounds. As such, shortnose sturgeon may be present in this area of the Potomac River in the spring and early summer. As noted above, shortnose sturgeon have not been documented in the Anacostia River. However, if suitable habitat and forage are present, occasional transient shortnose sturgeon may occur within the Anacostia. Shortnose sturgeon eggs are demersal and are concentrated at the spawning grounds and would not occur in the Anacostia River. Shortnose sturgeon larvae are typically found in the channel and while this life stage may enter the tidal Potomac and swim or drift past the mouth of the Anacostia, individuals are likely to be restricted to the deepwater channel in the Potomac and are not likely to occur in the Anacostia River.

The proposed project involves the replacement of a bridge over the Anacostia River. The new bridge will be located just downstream of the existing bridge. The new bridge will consist of a moveable span over the existing Federal navigation channel and will consist of at least six travel lanes centrally divided by a raised median or a low barrier wall. Construction of the bridge will be from barges. Construction will involve the driving of steel H piles and pipe pilings or installing concrete pilings in drilled shafts. The existing bridge decks will be demolished by removing the bridge in pieces and placing debris on barges. Debris will be disposed of at an upland location. The information provided by FHWA indicates that underwater blasting is unlikely; however, if it is required it will be done within a cofferdam and blasting design techniques (such as varying charge weights, charge delays and stemming) will be used to mitigate potential impacts from underwater blasting. Construction work, including pile driving, will take place within dewatered cofferdams or will employ an air bubble curtain system to minimize the potential for effects to aquatic life from the sound waves associated with pile driving. Additionally, FHWA has indicated that no in-stream construction work (excluding work within previously installed coffer dams) will occur between February 15 and July 1 of any year.

Despite an extensive sampling program in the Anacostia River which has occurred between February and November every year since 1991, no shortnose sturgeon have been documented in this river. The information provided by FHWA included an assessment of habitat suitability for shortnose sturgeon. The Anacostia River is largely a degraded system with a disturbed benthic community providing little to no suitable sturgeon forage items. There is also no habitat within the Anacostia River that could be considered suitable shortnose sturgeon spawning habitat. The river also does not have any deep holes which would be used by shortnose sturgeon for overwintering, resting, or as thermal refugia in the summer months. Shortnose sturgeon use of the river is likely further precluded by low dissolved oxygen levels in the river during the summer. Based on the best available information, it is unlikely that shortnose sturgeon use the Anacostia River for foraging, overwintering or spawning. While an occasional transient shortnose sturgeon may be present near the confluence of the river with the Potomac River,

sturgeon presence in the Anacostia River is likely to be rare. These transients would most likely be adult shortnose sturgeon migrating past the mouth of the Anacostia river while traveling to and from the spawning grounds near Little Falls. The spawning migration likely occurs between March and June.

Shortnose sturgeon are vulnerable to the impacts of in-water construction activities such as dredging and pile-driving. However, as only rare transient shortnose sturgeon are likely to be in the action area for this project, and in-water work will be prohibited during the time period that any shortnose sturgeon would be in the area, the likelihood of impacts to shortnose sturgeon from any activity associated with this project is discountable.

Based on the analysis that all effects of the proposed project, if adverse, will be discountable, NMFS is able to concur with the determination that the replacement of the Frederick Douglass Memorial Bridge over the Anacostia River is not likely to adversely affect any listed species under NMFS jurisdiction. Therefore, no further consultation pursuant to section 7 of the ESA is required. Should project plans change or new information become available that changes the basis for this determination, or a new species be listed or critical habitat designated, consultation should be reinitiated. Should you have any questions about this correspondence please contact Julie Crocker at (978) 281-9300 ext. 6530.

Sincerely,

Patricia A. Kurkul
Regional Administrator

Cc: Scida, F/NER3
Nichols, F/NER4 – Annapolis
Williams, GCNE
Brown, Parsons Brinckerhoff

File Code: Sec 7 FHWA DC DOT Frederick Douglas Memorial Bridge
PCTS I/NER/2007/00569

Heather Tatone

From: Christine Vaccaro - NOAA Federal [christine.vaccaro@noaa.gov]
Sent: Friday, August 16, 2013 2:37 PM
To: Derek Rodgers
Cc: Heather Speargas
Subject: Re: South Capitol Street project

Hi Derek,

Is this bridge crossing the Anacostia River?

As far as a BA goes, you should update your analyses to include Atlantic sturgeon. Because of the listing you must consider both shortnose and Atlantic sturgeon at this point for any projects that may affect listed species. Although these species are similar, there are some differences and both should be analyzed.

-Chris

Chris Vaccaro
Fisheries Biologist
Protected Resources Division
NOAA Fisheries/NERO

Gloucester, MA
Phone: 978-281-9167
Email: christine.vaccaro@noaa.gov

On Fri, Aug 16, 2013 at 2:32 PM, Derek Rodgers <derekr@coastal-resources.net> wrote:

Christine-

My name is Derek Rodgers, and I'm currently coordinating with various regulatory agencies regarding RTE species presence and potential impacts for a bridge project in Washington D.C. (South Capitol Street). A colleague of mine, David Smith, recently contacted you about shortnose and Atlantic sturgeon for the MD 261 bridge project. He pointed me in your direction since my point of contact for the aforementioned project, Julie Crocker, is currently on vacation and won't return until August 27th. I had planned on asking her whether a biological assessment would be required for the Atlantic sturgeon at this time, since a BA had already been completed for the shortnose several years ago and no impacts were expected to result from the project. When the BA was submitted, the Atlantic sturgeon had not yet been listed. Do you know if NMFS will accept the original shortnose sturgeon BA as a surrogate for the Atlantic sturgeon? If not, do you know of anyone I could contact about this issue?

Thanks in advance for your time.

Regards,

Derek Rodgers | *Environmental Scientist*

derekr@coastal-resources.net

office: (410) 956-9000, ext. 132

direct: (443)-837-2283

cell: (443) 386-1149

Coastal Resources Inc.

Ecological Consultants

25 Old Solomons Road

Annapolis, Maryland 21401