



Environmental Assessment for

Relocation of Navy Systems Management Activity

to Naval Support Facility Anacostia
District of Columbia

October 2009

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Environmental Assessment
for
Relocation of
Navy Systems Management Activity
to
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Abstract

This environmental assessment (EA) evaluates the potential impacts on the human environment of relocating the Navy Systems Management Activity (NSMA) from several locations in Arlington County, VA to a new, consolidated facility at Naval Support Facility (NSF) Anacostia in the District of Columbia. The proposed relocation is to comply with the Base Realignment and Closure (BRAC) Act of 2005. In addition to the No Action Alternative, two alternatives are considered in the EA: the Anacostia Alternative (preferred), which would construct the new facility on a site at NSF Anacostia near the intersection of Brookley Avenue and Thomas Road; and the Bellevue Alternative, which would construct the new facility on a vacant parcel of Bellevue Navy Housing. Neither action alternative would result in significant adverse impacts on the human environment. Preparation of an environmental impact statement is not required.

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Executive Summary

This environmental assessment (EA) has been prepared pursuant to Section 102 (2) (c) of the National Environmental Policy Act (NEPA) (42 USC 4331 et seq.), the regulations issued by the President's Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 CFR 1500-1508), and the Department of the Navy's NEPA procedures contained in 32 CFR 775.

ES.1 Proposed Action

The proposed action is to relocate the Navy Systems Management Activity (NSMA)'s 800 personnel, equipment, and programs from their current, various locations in Arlington County, VA, to Naval Support Facility (NSF) Anacostia in Washington, DC. To accommodate the agency, a new facility would be constructed, consisting of two elements: an administrative building and a warehouse. The agency would occupy the new facility by September 2011.

The administrative building would provide approximately 160,000 gross square feet of space, with a footprint of approximately 32,000 square feet. The warehouse would be approximately 23,000 square feet in size. Both buildings would incorporate sustainable design features sufficient to obtain a Leadership in Energy and Environmental Design (LEED) "Silver" rating. They would also incorporate Low Impact Development (LID) features consistent with the Navy's goal of no net increase in stormwater volume and in sediment and nutrient loadings for major renovation and construction projects.

ES.2 Purpose and Need

The purpose and need for the proposed relocation of NSMA to NSF Anacostia is to comply with the Base Realignment and Closure (BRAC) Act of 2005, which mandates that Navy organizations currently in leased space in Arlington County, VA be relocated to DoD-owned facilities in the National Capital Region.

ES.3 Alternatives

ES.3.1 Reasonableness Criteria

Three criteria were used to evaluate the reasonableness of potential alternatives:

- Criterion 1 - The alternative must comply with the 2005 BRAC mandate to relocate NSMA to a DoD-owned facility in the National Capital Region.
- Criterion 2 - The alternative must provide adequate administrative and warehousing space that meets the operational and security requirements of NSMA.
- Criterion 3 - The administrative building and the warehouse must be as close to each other as possible; while co-location is not strictly required, it should be preferred unless there is a clear, strong advantage that can make up for the disadvantage of keeping the administrative and warehousing functions of NSMA physically apart.

ES.3.2 Alternatives Considered but Dismissed

The Navy considered and dismissed alternatives that would have relocated NSMA either to existing space at the Washington Navy Yard or to Building 168 at NSF Anacostia. In both cases, it would have been necessary to build the proposed warehouse at a separate location due to the lack of available space. However, neither alternative presented the type of strong advantage that would have made these options compatible with Criterion 3. Therefore, these alternatives were dismissed.

ES.3.3 Alternatives Considered in the EA

Anacostia Alternative (Preferred): Under this alternative, a combined facility (administrative and warehousing) would be constructed on NSF Anacostia on a site about three acres in size, located northwest of the intersection of Brookley Avenue and Thomas Road. The northern part of the site consists of a parcel formerly occupied by Building 150, now demolished. The southern part of the site consists of a paved lot occupied by several temporary trailers and a semi-permanent building that would be moved to a location to be determined on NSF Anacostia to make room for the proposed combined facility.

Bellevue Alternative: Under this alternative, the proposed combined facility would be constructed on a parcel of the Navy's Bellevue Housing property, located to the south of NSF Anacostia, between Bolling Air Force Base and the Naval Research Laboratory.

No Action Alternative: Under the No Action Alternative, NSMA would not relocate from its current multiple locations in Arlington County to a Navy-owned facility. The No Action Alternative is not a reasonable alternative because it would be inconsistent with Criterion 1 and would put the Navy in violation of the 2005 BRAC Act. However, it is considered in the EA consistent with CEQ regulations.

ES.4 Impacts

ES.4.1 No Action Alternative

Under the No Action Alternative, there would be no changes to existing conditions at NSF Anacostia or Bellevue Housing and no impacts.

ES.4.2 Anacostia Alternative (Preferred)

Land Use and Plans: Implementation of the Anacostia Alternative would result in a change in land use at the project site, which is currently half-open, half-occupied by parking lots, temporary trailers, and a semi-permanent building. After the proposed action is completed, the site would be occupied by a half-administrative, half-light industrial facility. While this would represent a change in land use, the new land use would be compatible with its surroundings. The new facility would be outside all existing restricted areas. Because of its moderate scale and the functional and visual separation of NSF Anacostia from the neighborhoods to the east by South Capitol Street and I-295, there is no potential for indirect land use impacts outside the installation.

The Anacostia Alternative generally supports the goals of the *Comprehensive Plan for the National Capital - Federal Elements - Federal Workplace*. It would have no adverse effect on ongoing plans, initiatives, and projects at NSF Anacostia or in its vicinity.

Socioeconomics: In the short or medium term, because of the relatively short distance between the current locations of NSMA in Arlington County, VA and NSF Anacostia, it is not expected that the proposed relocation of the agency would result in a significant number of NSMA employees moving their residences. In the long term, with normal personnel turnover, proximity to Anacostia would become a factor to consider for new personnel seeking housing, resulting in a change in NSMA staff's overall residential patterns. However, such change would take place slowly and progressively, with negligible impacts at both the local and regional level.

Construction of the proposed facility would have a positive impact on the local economy as it would generate design and construction jobs and revenues. However, in the context of the Washington DC regional economy, this impact would be small.

The proposed relocation of NSMA to NSF Anacostia would not disproportionately affect minority or economically disadvantaged populations protected under Executive Order (EO) 12898. Nor would it affect children under EO 13045.

Transportation: The Anacostia Metrorail Station, near the intersection of Firth Sterling Avenue and Howard Road, SE, is located approximately 4,500 feet from the project site. In addition to the distance, the lack of adequate sidewalks and the reputation of the surrounding neighborhood as a high-crime area are likely to discourage Metrorail users. The Navy has prepared a Transportation Management Plan (TMP) that outlines measures to encourage transit usage among NSMA employees. At this stage, the number of NSMA employees who would regularly ride Metrorail cannot be estimated. However, it can be expected that any increase in passenger loads at Anacostia Station would be absorbed into the increase planned for by the Washington Metropolitan Area Transit Authority (WMATA).

The relocation of NSMA to NSF Anacostia would generate new traffic to and from the installation. To assess the impacts of this traffic increase on the local road network, a level of service (LOS) analysis was conducted for six intersections in the vicinity of the installation for the year 2011. The analysis showed that LOS under the Anacostia Alternative would be the same as under no action conditions, though with slightly increased delays: all study intersections would operate at an overall LOS C or better, with the exception of the intersection of South Capitol Street at Firth Sterling Avenue, which would operate at LOS D during the PM peak period. LOS D is an

acceptable LOS in a dense urban area such as Washington, DC. Thus, the Anacostia Alternative is not expected to result in significant traffic impacts.

Construction of the proposed new NSMA facility would not increase NSF Anacostia's parking capacity. NSMA employees would use existing surplus parking. Demand is expected to exceed the supply of parking within walking distance (0.25 mile) of the facility by about 163 spaces. The Navy would implement measures to reduce parking demand from its employees in order to better match the supply and to comply with the National Capital Planning Commission's (NCPC) parking ratio requirements for Federal facilities in the District of Columbia. Such measures, primarily designed to encourage employees to commute by transit or to rideshare, are delineated in a TMP prepared for this proposed action. It is not expected that any significant number of NSMA employees would seek parking on public streets.

Air Quality: Quantitative and qualitative evaluation showed that the local emissions of carbon monoxide (CO) and particulate matter (PM₁₀ and PM_{2.5}) that would be generated by the new traffic resulting from the proposed action would not be significant. The only long-term stationary source of new emissions would be the heating boiler(s) of the proposed facility. Based on the size and function of the facility, these emissions are not expected to be significant. In the short term, construction of the proposed facility would cause some air quality impacts. These impacts would be minimized using standard best management practices (BMPs) and would not be significant. Because the proposed action would take place in a non-attainment area for ozone (O₃) and PM_{2.5}, a General Conformity Rule (GCR) analysis has been conducted. The expected increases in annual emissions of the relevant criteria pollutants or their precursors would not exceed the applicable *de minimis* levels. Therefore, a formal conformity determination is not required. Additionally, the increase in annual emissions is not projected to exceed 10 percent of the Washington DC regional emissions inventory; therefore, the Anacostia Alternative would not result in significant regional air quality impacts.

Noise: Equipment and vehicle operations during the construction of the proposed NSMA facility would result in temporary noise impacts. These impacts would not be significant. Based on general acoustical principles, the increase in traffic that would result from the proposed action is not expected to cause a noticeable increase in ambient noise levels.

Cultural Resources: The proposed action under this alternative would have no effect on National Register-listed or eligible architectural or archaeological resources. The site where the proposed facility would be built has been extensively disturbed and has little potential to contain intact archaeological resources. If, however, archaeological artifacts or skeletal remains were uncovered by construction activities, work would stop immediately. The Navy would consult with the DC Historic Preservation Office (DCHPO) and other parties, as appropriate, before resuming any activities that could disturb the find.

Natural Resources: Construction of the proposed new facility would disturb the project site's soils over an area of approximately three acres. The flatness of the site would contribute to minimizing construction-related erosion. Additionally, BMPs such as silt barriers or the seeding of exposed soils would be used to further limit the risk of erosion. Land disturbing activities affecting more than 50 square feet in the District of Columbia require the preparation of an erosion and sediment control plan to be reviewed and approved by the DC Department of the Environment, Watershed Protection Division. Preparation and implementation of an approved erosion and sediment control plan in compliance with this requirement would ensure that erosion-related impacts are minimal and not significant.

Implementation of the Anacostia Alternative would have no direct impact on surface water resources. The project site does not contain wetlands; nor is it located within the 100-year floodplain. In the long term, construction of the proposed facility would increase the amount of impervious surfaces at the site, which is currently partly pervious. However, LID features would minimize impacts on stormwater volume and sediment and nutrient loadings. These features would be incorporated into the stormwater management plan required by the District of Columbia for projects disturbing more than 5,000 square feet. Thus, impacts on both the quantity and the quality of the stormwater runoff generated by the project site would be minimal and not significant.

Impacts to biological resources would be negligible. A few trees and some marginal habitat that may accommodate common urban species would be lost. The new facility's landscaping would partially offset this loss. The proposed action would have no effect on threatened or endangered species, including the shortnose sturgeon, which may be present in the Potomac and Anacostia rivers. Nor would the proposed action have a

significant adverse impact on migratory birds protected under the Migratory Bird Treaty Act of 1918.

Hazardous Materials and Waste. NSMA operations at its proposed new consolidated facility would require the storage and use of hazardous materials and result in the generation, storage, and disposal of hazardous waste. Small amounts (no more than ten pounds) of simunition (non-lethal training rounds similar to paintballs) would occasionally and temporarily be stored in the proposed warehouse. These rounds are classified 1.4S, meaning they create minimal explosive risk. They and all hazardous materials and waste would be handled in accordance with applicable Navy guidelines and requirements, and local and Federal laws and regulations, resulting in no adverse impacts to the human environment. Recent subsurface investigations of the project site have found that petroleum-impacted soils may be present. Prior to beginning any soil disturbing activities, the Navy would review this finding and conduct additional investigations, as needed. If the presence of contaminated soils is confirmed, appropriate measures would be taken to remove and dispose of the impacted soils in accordance with applicable regulations.

ES 4.3 Bellevue Alternative

Land Use and Plans: Implementation of the Bellevue Alternative would result in a change in land use at the project site. The site is currently open and undeveloped, part of a larger parcel, also mostly undeveloped. Construction of the proposed consolidated facility would introduce a new land use to the area, in the form of a half-administrative, half-light industrial compound. This new land use would not be entirely compatible with its surroundings, as it would be close to residential uses (Bellevue Housing, Bolling Housing). However, there would remain sufficient undeveloped buffers between the proposed facility and the nearest residential areas to minimize any adverse impacts to the livability or desirability of the existing and future military housing neighborhoods. Any adverse impacts would be minor. As under the Anacostia Alternative, there would be no impact to off-base land uses.

The Bellevue alternative generally supports the goals of the *Comprehensive Plan for the National Capital - Federal Elements - Federal Workplace*. It would have no adverse effect on the several plans, initiatives, and projects in the vicinity of the project site, with one partial exception: the site where the proposed facility would be built under this alternative is

included in the Bellevue Housing privatization project. Therefore, implementation of this alternative would require removing at least the site and its immediate surroundings from the project's land lease area and keeping them under direct government control. The alternative would not otherwise affect the privatization project. The adverse impact, therefore, would be minor.

Socioeconomics: The impacts of the Bellevue Alternative would be the same as those of the Anacostia Alternative. These impacts would be negligible.

Transportation: The impacts of the Bellevue Alternative would be the same as, or similar to, those of the Anacostia Alternative and would not be significant. However, the projected parking deficit would be greater because there is no existing parking within reasonable walking distance of the project site. In addition to measures promoting transit usage and ridesharing, additional measures to make existing remote existing parking usable by NSMA employees (e.g., shuttle service between remote parking areas and the new facility) may be required. Implementation of this alternative would require additional parking studies. No impacts on public parking are expected.

Air Quality: The impacts of the Bellevue Alternative would be the same as those of the Anacostia Alternative and would not be significant.

Noise: The impacts of the Bellevue Alternative would be the same as those of the Anacostia Alternative and would not be significant.

Cultural Resources: Construction of the proposed NSMA facility under the Bellevue Alternative would likely disturb Site 51SW7, a prehistoric archaeological site that was found to be potentially eligible for listing in the National Register during a survey conducted in 1994. Consistent with the 1994 report's recommendations and in compliance with Section 106 of the National Historic Preservation Act, The Navy would conduct a Phase II evaluation of Site 51SW7 to determine its National Register eligibility prior to beginning any ground-disturbing activities. Following completion of the Phase II survey and its review and approval by the DCHPO, potential adverse effects to the site from the proposed action would be evaluated and, if appropriate, a memorandum of agreement (MOA) would be drafted to define mitigation measures. These measures would ensure that any adverse effects are mitigated and not significant.

Implementation of the proposed action would not begin until the Section 106 consultation process is complete.

Natural Resources: The impacts of the Bellevue Alternative would be similar to those of the Anacostia Alternative and would be negligible.

Hazardous Materials and Waste: As under the Anacostia Alternative and for the same reasons, there would be no significant adverse impacts pertaining to hazardous materials and waste. However, no subsurface investigations have been conducted at the alternate site and no information pertaining to potential soil contamination is available. Therefore, should the Navy select this site for constructing the proposed NSMA facility, due diligence would be made to ascertain the presence of any contaminants in the soil above applicable regulatory thresholds. Any impacted soils would be removed and disposed of in accordance with applicable laws and regulations.

ES.5 Conclusion

Based on the analyses contained in the EA, the proposed relocation of NSMA under either the Anacostia Alternative (preferred) or the Bellevue Alternative would not result in significant adverse impacts on the human environment. Preparation of an EIS is not required.

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Acronyms and Abbreviations

A	
ADT	Annual Daily Traffic
AFB	Air Force Base
AT/FP	Anti-terrorism/Force Protection
AWI	Anacostia Waterfront Initiative
B	
BRAC	Base Realignment and Closure
C	
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDC	Child Development Centers
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Commission of Fine Arts
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CT	Census Tract
D	
dB	Decibel
dBA	A-weighted Decibel
DC	District of Columbia
DCA	Ronald Reagan-National Airport
DCHPO	District of Columbia Historic Preservation Office
DCOH	District of Columbia Department of Health
DCOP	District of Columbia Office of Planning

DDOE	District of Columbia Department of the Environment
DDOT	District of Columbia Department of Transportation
DHS	Department of Homeland Security
DIA	Defense Intelligence Agency
DIAC	Defense Intelligence Agency Center
DNL	Day-Night Average Sound Level
DoD	Department of Defense
E	
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ER	Environmental Restoration
ESA	Endangered Species Act
F	
FEMA	Federal Emergency Management Administration
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
G	
GCR	General Conformity Rule
GSA	General Services Administration
H	
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HPO	Historic Preservation Office
L	
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LLC	Limited Liability Company

LOS	Levels of Service
LQO	Large Quantity Generator
M	
MPH	Mile per Hour
MPO	Metropolitan Planning Organization
MWCOG	Metropolitan Washington Council of Governments
N	
NAAQS	National Ambient Air Quality Standard
NCPC	National Capital Planning Commission
NDW	Naval District Washington
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRL	Naval Research Laboratory
NSA	Naval Support Activity
NSF	Naval Support Facility
NSMA	Navy Systems Management Activity
O	
O ₃	Ozone
P	
Pb	Lead
PCB	Polychlorinated Biphenyls
PID	Photo-Ionization Detector
PM ₁₀	Particulate Matter less than 10 micrometers
PM _{2.5}	Particulate Matter less than 2.5 micrometers

ppm	Part per Million
PPV	Public/Private Venture
R	
RBSL	Risk-Based Screening Levels
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act of 1976
RDT&E	Research, Development, Testing, and Evaluation
ROD	Record of Decision
RSIP	Regional Shore Infrastructure Plan
S	
SARA	Superfund Amendments and Reauthorization Act
SCIF	Sensitive Compartmented Information Facility
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
SVOC	Semi-Volatile Organic Compound
T	
TMP	Transportation Management Plan (or Program)
TPH-DRO	Total Petroleum Hydrocarbons-Diesel Range Organics
TPH-GRO	Total Petroleum Hydrocarbons-Gasoline Range Organics
tpy	Ton per Year
U	
UFC	United Facilities Criteria
USC	United States Code
USEPA	United States Environmental Protection Agency
V	
VA	Virginia

v/c	Volume/Capacity Ratio
VMT	Vehicle Mile Traveled
VOC	Volatile Organic Compound
vph	Vehicles per Hour
W	
WMATA	Washington Metropolitan Area Transit Authority

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1. Purpose and Need

This environmental assessment (EA) evaluates the impacts on the human environment of relocating the Navy Systems Management Activity (NSMA) from various locations in Arlington County, Virginia, to a new facility at Naval Support Facility (NSF) Anacostia in Washington, DC. The proposed relocation is to comply with the Base Realignment and Closure (BRAC) Act of 2005. The EA has been prepared pursuant to Section 102 (2) (c) of the National Environmental Policy Act (NEPA) (42 USC 4331 et seq.), the regulations issued by the President's Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 CFR 1500-1508), and the Department of the Navy's NEPA procedures contained in 32 CFR 775.

1.1 Background

1.1.1 BRAC Mandate for NSMA

On September 8, 2005, the BRAC Commission issued its final recommendations to the President following its review of the Secretary of Defense's recommendations issued on May 13, 2005. The President approved the final recommendations on September 15, 2005 and forwarded them to Congress. Congress did not alter any of the BRAC Commission's recommendations and on November 9, 2005, the recommendations became law. The BRAC Commission's recommendations must now be implemented as provided for in the Defense Base Closure and Realignment Act (Public Law 101-510), as amended.

BRAC Recommendation #149 provides for the closure of several leased Navy installations in the National Capital Region and the relocation of the organizations occupying these installations to Department of Defense (DoD)-owned space in the National Capital Region. NSF Anacostia and the Washington Navy Yard were among the Navy facilities identified by the BRAC Commission as most likely relocation sites.

This recommendation meets the DoD's objective to reduce its reliance on leased space, which historically has been more

costly than government-owned space and generally does not meet current anti-terrorism/force protection (AT/FP) requirements.

NSMA is one of the Navy organizations affected by the BRAC mandate to move out of leased space and relocate to a DoD facility. NSMA's mission is to provide logistics support to the Navy. Logistics is the management of the flow of goods, information, or other resources between the point of production and the point of consumption or use. Warehousing, inventory, handling, packaging, transportation, and delivery are all elements of logistics.

NSMA currently occupies several separate leased administrative facilities in the Crystal City and Clarendon neighborhoods of Arlington County, VA. The agency additionally maintains a warehouse, also located in Arlington County. A total of approximately 800 persons work at these locations.

1.1.2 NSF Anacostia

NSF Anacostia is located in the southwestern quadrant of the District of Columbia, along the eastern shore of the Anacostia River, near the river's confluence with the Potomac and across the Potomac from Arlington County (See Figures 1-1 and 1-2). NSF Anacostia is a component of Naval Support Activity (NSA) Washington, one of four NSAs within Naval District Washington (NDW).

In compliance with the 2005 BRAC Act, NSF Anacostia is in the process of becoming a joint base with Bolling Air Force Base (AFB), home to the Air Force's 11th Wing and located immediately to the south of NSF Anacostia. The Anacostia-Bolling joint base will be managed under NSA Washington and NDW.

Even before the BRAC mandate to become one joint base, NSF Anacostia and Bolling AFB, though administratively distinct, were physically continuous and shared a perimeter fence and entry gates. Both installations have broadly similar missions. They provide support to personnel assigned to the National Capital area, including personnel administration and assistance, personnel property movement, medical care, fire protection and emergency response, housing, distinguished visitor and high-ranking personnel transportation, and various morale, welfare, and recreation activities. Both installations also support representational activities such as the Navy Ceremonial Guard and the Air Force Honor Guard.

Area Map

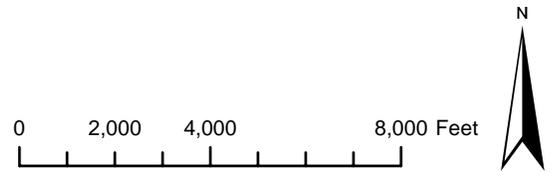


Figure 1-1

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NSF Anacostia & Adjacent Installations



-  Navy Perimeter
-  Bellevue Housing

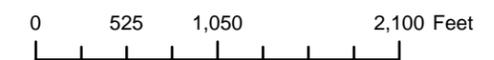


Figure 1-2

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The future Anacostia-Bolling joint base occupies 958 acres (351 acres for NSF Anacostia and 607 acres for Bolling AFB). It is bounded by the Anacostia River and the Potomac River to the west, South Capitol Street and Interstate Highway 295 (I-295) to the east, Poplar Point and the Frederick Douglass Memorial Bridge to the north, and the Navy's Bellevue Housing to the south. Bellevue Housing provides housing for enlisted military personnel and their families. It is located at the Naval Research Laboratory (NRL). Like NSF Anacostia, NRL is a component of NSA Washington. Its main facilities lie to the south of Bellevue Housing. Although Bellevue Housing has its own access gate, which it shares with NRL, the westernmost, mostly undeveloped part of the property is within Bolling AFB and can be reached via the base's South Gate.

1.2 Purpose and Need

The purpose and need for the proposed relocation of NSMA to NSF Anacostia is to comply with the BRAC mandate to relocate Navy organizations currently in leased space in Arlington County to DoD-owned facilities in the National Capital Region.

1.3 The NEPA Process

NEPA provides for the consideration of environmental issues in Federal agency planning and decision-making. Under NEPA, Federal agencies must prepare an Environmental Impact Statement (EIS) or an EA for any Federal action, except those actions that are determined to be "categorically excluded." An EIS is prepared for those Federal actions that may significantly affect the quality of the human environment. An EA is a concise public document that serves to provide sufficient evidence and analysis for determining whether to prepare an EIS. The EA includes brief discussions of the following:

- The need for the proposal.
- The alternatives (as required under Section 102 [2] [E] of NEPA).
- The environmental impacts of the proposed action and alternatives.

The EA results in either a Finding of No Significant Impact (FONSI) or a decision to prepare an EIS. If, based on this EA, the Navy determines that the proposed action would have no significant impacts on the quality of the human environment, a FONSI will be issued. If the Navy determines that the proposed action would have a significant impact on the quality of the human environment, preparation of an EIS will be initiated.

2. Proposed Action and Alternatives

The Council on Environmental Quality's (CEQ) regulations for implementing NEPA establish a number of policies for Federal agencies, including using "...the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment" (40 CFR 1500.2[e]). This chapter describes the proposed action (Section 2.1) and the alternatives considered by the Navy to meet its purpose and need (Sections 2.2.1 and 2.2.2). Section 2.2.3 addresses the No Action Alternative.

2.1 Proposed Action

The proposed action is to relocate NSMA's 800 personnel, equipment, and programs from their current, various locations in Arlington County, VA, to NSF Anacostia in Washington, DC. To accommodate the agency, a new facility would be constructed, consisting of two elements: an administrative building and a warehouse (see Figure 2-1).

The administrative building would provide approximately 160,000 gross square feet of space, with a footprint of approximately 32,000 square feet. It would be a reinforced steel-framed masonry structure on a pile foundation system. About half the roof would be dedicated to a green roof feature and about 30 percent to a paved deck accessible to personnel during breaks and lunch hour.

To accommodate NSMA's security requirements, the building would include five independent zoned Sensitive Compartmented Information Facility (SCIF) areas. Fenestration would be limited to the public lobby area.

Interior spaces would include closed offices and open work areas, conference rooms, a photographic laboratory, storage areas, restrooms, mechanical and electrical rooms, and support spaces (e.g., stairwells and elevators). Connections to existing utility systems (water, sanitary and storm sewers, electricity, and data) would be provided.

Exterior work would involve lighting, roadway improvements, paved parking (46 parking spots) and driving areas, sidewalks, stormwater management features, and landscaping.

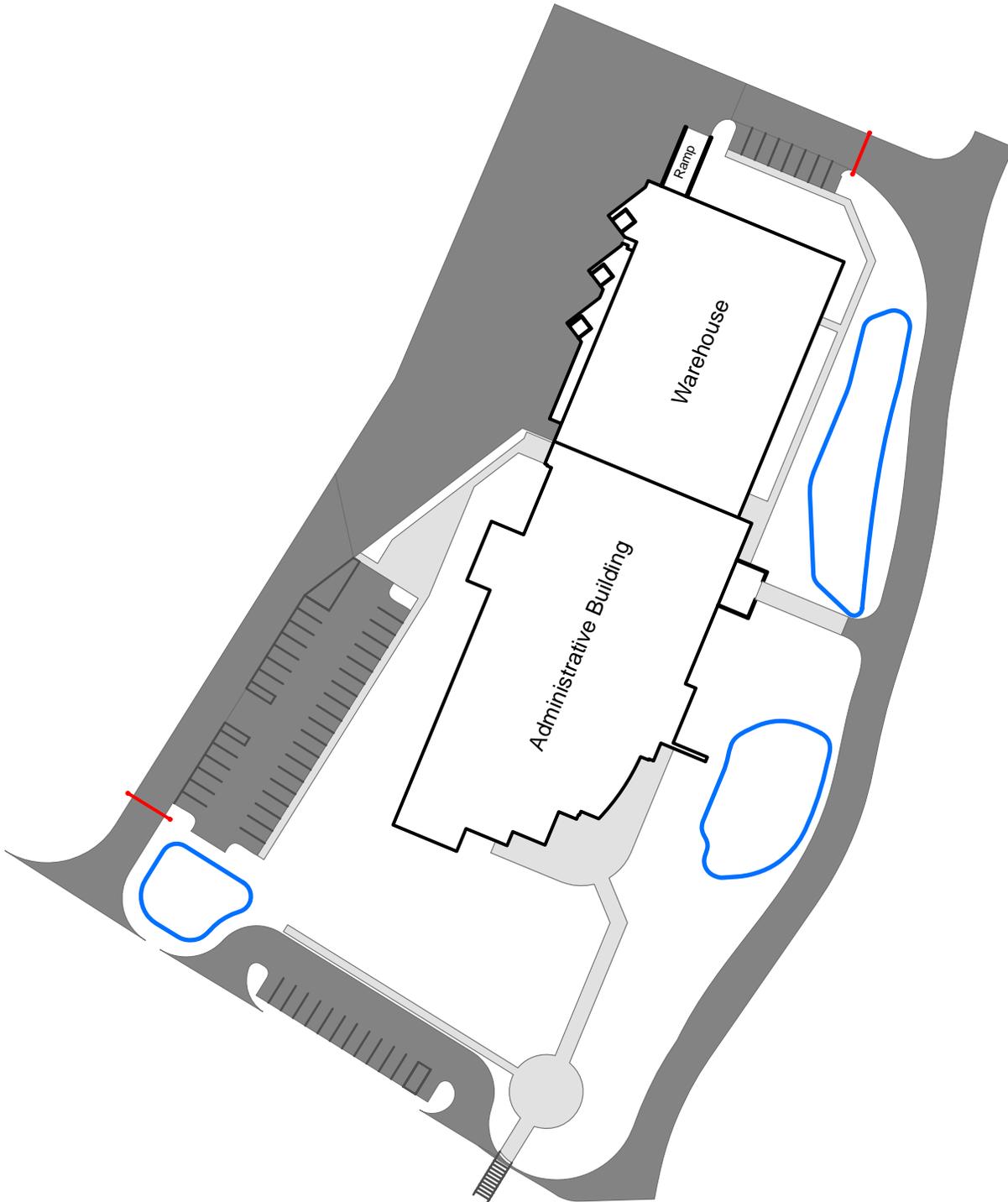
The warehouse would be built adjacent to the administrative facility. It would be approximately 23,000 square feet in size, with an 18-foot overhead clearance and an open SCIF environment, as required by NSMA's operations. It would include three loading docks. On average, three tractor trailers would access or leave the facility every day to load or unload materials and equipment.

Both the administrative building and the warehouse would incorporate sustainable design features sufficient to obtain a Leadership in Energy and Environmental Design (LEED) "Silver" rating. In addition to the green roof already mentioned, such features may include low water usage landscaping, room occupancy sensors, and use of regional recyclable and non-toxic construction materials, among others.

Additional sustainability features would be incorporated in the final design, consistent with the Navy's requirement that Low Impact Development (LID) techniques be used to meet the goal of no net increase in stormwater volume and in sediment and nutrient loadings for major renovation and construction projects. LID must be used for all projects that will be under construction in 2011. For projects scheduled to be under construction prior to that date, the voluntary incorporation of LID features consistent with the policy is strongly encouraged. LID utilizes strategies that allow for the storage, filtration, evaporation, and/or retention of runoff close to its source. For instance, runoff from the new facility's roof and new paved areas would be collected and routed through on-site storm drains and grass swales to a bio-retention/bio-filtration area where the first half-inch of runoff would be retained and filtered before being discharged to the existing storm drainage system.

Per the Energy Independence and Security Act of 2007, Section 438, "the sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Navy guidance for the implementation of this policy is under development. However, the

Proposed Combined Facility



- Gate
- Sidewalk
- Pavement
- Stormwater Management Pond

0 50 100 200 Feet



Figure 2-1

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intent of the policy would be considered in the final design of the proposed facility.

Stand-off distances consistent with applicable AT/FP standards would be provided. Other AT/FP features would include a mass notification system, external lighting, and an intrusion detection system. Access to the facility would be restricted to authorized personnel and visitors.

The facility would be operational with all personnel, equipment, and program moved in by September 2011.

2.2 Alternatives

NEPA regulations call for the consideration and assessment in the EA of reasonable alternatives. Alternatives that are not reasonable do not need to be evaluated. Consistent with this requirement, Section 2.2.1 describes the alternatives the Navy considered but dismissed from further consideration in the EA because these alternatives were found not to be reasonable. Section 2.2.2 describes the alternatives that are being carried forward and evaluated in this EA. Section 2.2.3 addresses the No Action Alternative.

Three criteria were used to evaluate the reasonableness of each potential alternative:

- **Criterion 1** - The alternative must comply with the 2005 BRAC mandate to relocate NSMA to a DoD-owned facility in the National Capital Region.
- **Criterion 2** - The alternative must provide adequate administrative and warehousing space that meets the operational and security requirements of NSMA.
- **Criterion 3** - The administrative building and the warehouse must be as close to each other as possible; while co-location is not strictly required, it should be preferred unless there is a clear, strong advantage that can make up for the disadvantage of keeping the administrative and warehousing functions of NSMA physically apart.

Criterion 2 significantly constrained the range of feasible alternatives since only installations with either adequate existing space or sufficient room for new construction could be considered. The Navy identified three DoD-owned facilities in

the National Capital Region that could potentially accommodate NSMA: the Washington Navy Yard; NSF Anacostia; and Bellevue Housing, just south of NSF Anacostia and Bolling AFB (see Section 1.1.2).

2.2.1 Alternatives Considered but Dismissed

2.2.1.1 Relocating NSMA to the Washington Navy Yard

Early in the planning process, the Navy considered relocating NSMA to the Washington Navy Yard. However, the Washington Navy Yard could only accommodate NSMA's requirement for administrative space, because the Navy Yard has no adequate existing warehousing space available. Nor does it have any room to construct a new warehouse adequate to NSMA's needs. Therefore, any alternative that would relocate NSMA to the Washington Navy Yard would require keeping the administrative building and warehouse separate. Under Criterion 3, such an alternative could be reasonable only if it presents a strong advantage that could make up for the disadvantage of keeping the agency's administrative and warehousing functions physically apart.

With respect to the Washington Navy Yard, only one factor could be considered to constitute such a strong advantage: a small group of NSMA employees is already present in Building 111. The cost and inconvenience of moving these employees would be avoided if the rest of the agency joined them. Therefore, the Navy considered renovating Building 111 for use by NSMA.

However, independent planning considerations resulted in Building 111's being assigned to a different command. This eliminated the possibility of NSMA's moving to the building and made it likely that the NSMA employees in Building 111 would have to move to join the rest of the agency in its new building. This eliminated the only strong advantage of relocating NSMA to the Navy Yard. Even if the NSMA employees currently in Building 111 were able to stay in that building, there is no available space at the Navy Yard that could adequately accommodate the rest of agency. Therefore, alternatives that would relocate NSMA to the Washington Navy Yard were eliminated from further consideration. Such alternatives are not considered in the rest of this EA.

2.2.1.2 Relocating NSMA to Existing Space at NSF Anacostia

The Navy next considered relocating NSMA to existing space on NSF Anacostia. One existing building was identified that could potentially be renovated to accommodate the agency: Building 168 (see Figure 2-2). Renovating Building 168 for use by NSMA, however, would mean that the administrative and warehousing functions of the agency could not be co-located because there is no room adjacent to Building 168 to construct the required warehouse. Since there is no existing space on NSF Anacostia that could be used by the agency as a warehouse, if NSMA moved to Building 168, a new warehouse would have to be built at a separate location. Under Criterion 3, this physical separation of NSMA's administrative and warehousing functions could be a reasonable alternative provided there is a strong advantage in adopting it.

Upon initial consideration, the one primary advantage of accommodating NSMA in existing rather than new space was financial, as renovation of an existing facility could be expected to be less costly than constructing a new one. However, a cost analysis showed that because of the extensive renovations and modifications that would be required to make Building 168 adequate to NSMA's needs, this option would in fact be less cost-effective than new construction. This eliminated the only strong advantage there would have been in moving the administrative functions of NSMA to Building 168 and thus keeping them separate from the warehousing functions. Therefore, the alternative was found to fail under Criterion 3 and is not considered further in this EA.

2.2.2 Alternatives Carried Forward

Following the elimination of alternatives that would have relocated NSMA to existing space at either the Washington Navy Yard or NSF Anacostia and, therefore, kept the administrative and warehouse functions of NSMA physically separate (see Sections 2.2.1.1 and 2.2.1.2, respectively), only alternatives involving the construction of a new, integrated facility with the proposed administrative building and warehouse adjacent to each other were selected for further consideration and evaluation in the EA.

2.2.2.1 Relocating NSMA to a New Combined Facility at NSF Anacostia (Anacostia Alternative - Preferred Alternative)

After reviewing existing operational and environmental constraints as well as existing and planned land uses at NSF Anacostia, the Navy identified one site on the installation that could accommodate the proposed combined facility. This site, about three acres in size, is located northwest of the intersection of Brookley Avenue and Thomas Road (see Figures 2-2 and 2-3).

The northern part of the site consists of a parcel formerly occupied by Building 150, now demolished. A narrow, unused parking lot separates this parcel from a large, fenced vehicle storage yard to the north. The southern part of the site consists of a paved lot occupied by several temporary trailers that would be relocated to a location to be determined on NSF Anacostia to make room for the proposed combined facility. To the south, the site is separated from Thomas Road by Building 387 and surrounding chain link fence enclosure. Building 387 is a semi-permanent building that would be moved to a location to be determined on NSF Anacostia to make room for the proposed combined facility. In addition to these relocations, the small stretch of Brookley Avenue fronting the site on the east would be realigned a short distance to the east to increase the amount of usable land (see Figure 2-3).

Because it has been disturbed previously and is readily available for redevelopment, this site is the Navy's preferred location for the proposed combined NSMA facility. Building the proposed facility at this location as shown in Figure 2-3 is the Navy's Preferred Alternative.

2.2.2.2 Relocating NSMA to a New Combined Facility on Bellevue Housing Property (Bellevue Alternative)

Upon review, the northwestern corner of Bellevue Housing was found adequate to accommodate a combined facility for NSMA on a three-acre site fronting McGuire Avenue (See Figure 2-2). This area is within the Bolling AFB - NSF Anacostia perimeter fence. It is currently open and vegetated with grass and a few hardwood trees.

The option of developing this parcel as an annex to NSF Anacostia was already considered in the *Anacostia Annex Site Development Plan* completed in December 2004. As indicated in Section 1.1.2 of this EA, NSF Anacostia and Bolling AFB are

Project Sites Considered at NSF Anacostia & Bellevue Housing



- Navy Perimeter
- Bellevue Housing
- Preferred Site (Anacostia Alternative)
- Alternate Site (Bellevue Alternative)

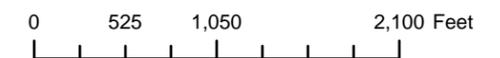
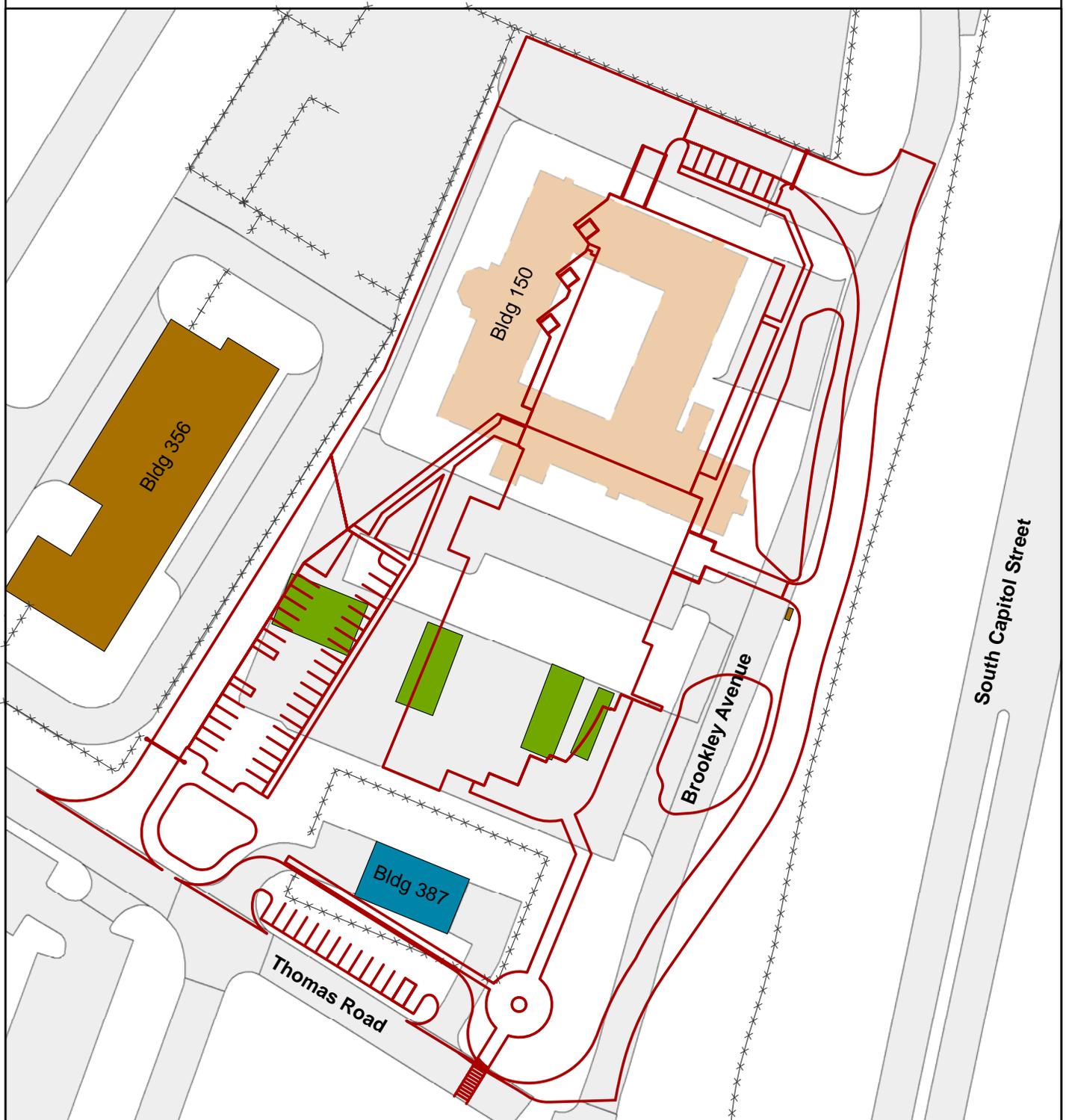


Figure 2-2

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Anacostia Alternative (Preferred)



- | | |
|--|--|
|  Proposed Combined Facility |  Existing Building |
|  Existing Fence |  Existing Semi-Permanent Building To Be Relocated |
|  Existing Pavement |  Temporary Trailer To Be Removed |
| |  Demolished Building |

0 50 100 200 Feet



Figure 2-3

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being combined into a joint base under Navy management. Under the Bellevue Alternative, the portion of Bellevue property where the NSMA facility would be located would be withdrawn from the ongoing Bellevue Housing privatization process (see Section 3.1.2.2) and administratively attached to the joint base.

2.2.3 No Action Alternative

Under the No Action Alternative, NSMA would not relocate from its current multiple locations in Arlington County to a DoD-owned facility. The agency would continue to operate as at present.

The No Action Alternative is not a reasonable alternative because it would be inconsistent with Criterion 1 and would put the Navy in violation of the 2005 BRAC Act. However, it is considered in this EA consistent with CEQ's regulations.

2.3 Summary Comparison of Alternatives

Table 2-1 shows a summary comparison of the impacts of the alternatives considered in this EA. Impacts are more fully described and evaluated in Chapter 4.

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Table 2-1
Summary Comparison of Alternatives

Resource Area	No Action Alternative	Anacostia Alternative (Preferred)	Bellevue Alternative
Land Use and Plans	No impacts.	<p>No adverse land use impacts. The proposed facility would be compatible with its surroundings.</p> <p>Consistent with the <i>Federal Workplace Element</i> of the <i>Comprehensive Plan for the National Capital</i>. No adverse impacts on ongoing plans, initiatives, and projects.</p>	<p>Minor adverse impacts due to the presence of residential neighborhoods in the vicinity of the project site.</p> <p>Consistent with the <i>Federal Workplace Element</i> of the <i>Comprehensive Plan for the National Capital</i>. Would require withdrawing the project site and its surroundings from the ongoing privatization process of Bellevue Housing. No adverse impacts on other ongoing plans, initiatives, and projects.</p>
Socioeconomics	No impacts.	Negligible demographic impacts. Small positive economic impact. No Environmental Justice impacts; no disproportionate impacts on children.	Same.
Transportation	No impacts.	<p>No significant impacts on transit systems.</p> <p>No significant traffic impacts: levels of service (LOS) at six area intersections would be the same as under no action conditions (D or better), with slightly higher delays.</p> <p>No impact on public parking. No significant change in the amount of available parking. NSMA employees would use existing surplus parking. Demand is projected to exceed supply by about 163 spaces. Transportation management measures would be implemented to reduce parking demand.</p> <p>Negligible construction-related impacts.</p>	Same, except that the projected parking space deficit would be larger than under the Anacostia Alternative because of the more remote location of the site. Transportation management measures would be implemented to reduce parking demand and make remote surplus parking usable by NSMA employees. Additional parking studies would be needed.

Resource Area	No Action Alternative	Anacostia Alternative (Preferred)	Bellevue Alternative
Air Quality	No impacts.	<p>Minor short-term construction-related impacts.</p> <p>No significant long-term increases in emissions of carbon monoxide and particulate matter 2.5 micrometers in size (PM_{2.5}). Emissions of criteria pollutants would be below the applicable <i>de minimis</i>. A formal General Conformity Rule analysis is not required.</p>	Same.
Noise	No impacts.	Minor short-term construction related impacts. Negligible long-term impacts.	Same.
Cultural Resources	No impacts.	No adverse effects to historic architectural resources. The project site has been previously disturbed and has low potential for archaeological resources.	An existing archeological site, 51SW7, would be disturbed. In compliance with Section 106, and prior to starting any ground-disturbing activities, the Navy would determine the National-Register eligibility of this site, evaluate the potential adverse effects of the proposed action, and, if appropriate, define mitigation measures in consultation with the DC Historic Preservation Office. Compliance with Section 106 would ensure that any adverse effects are mitigated and non-significant.
Natural Resources	No impacts.	Negligible adverse impacts on natural resources. Standard best management practices would minimize construction-related erosion. Low Impact Development (LID) techniques would minimize impacts related to stormwater. Small loss of marginal habitat likely used only by the most common urban species. No adverse effect to threatened or endangered species. No impact on migratory birds.	Same.

Resource Area	No Action Alternative	Anacostia Alternative (Preferred)	Bellevue Alternative
Hazardous Materials and Waste	No impacts.	No impact. Contaminated soils may be present on the site and, if confirmed, would be removed and disposed of in accordance with applicable laws and regulations. This would amount to a small positive impact.	No impacts. Due diligence investigations would be made to ascertain whether the site contains contaminated soils. If so, these soils would be removed in accordance with applicable laws and regulations.

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3. Affected Environment

CEQ's regulations (40 CFR Part 1500 et seq.) implementing NEPA require documentation that succinctly describes the environment of the area(s) potentially affected by the alternatives under consideration. The primary study area for this EA consists of the two sites - the preferred site at NSF Anacostia and the alternate site on Bellevue Housing-NRL property just south of Bolling AFB - that are being considered for the proposed combined NSMA facility, and their immediate surroundings. For some resources, a larger area is described because potential impacts could occur beyond the boundaries of the sites. The impacts on the environment of the alternatives being considered by the Navy are described in Chapter 4.

For the purposes of this and the following chapters, the physically unified but administratively diverse Federal property comprising NSF Anacostia, Bolling AFB, and the parcel of Bellevue Housing-NRL property containing the alternate site is collectively referred to as the "Bolling-Anacostia Installation" or "the Installation."

3.1 Land Use and Plans

3.1.1 Existing Land Use

3.1.1.1 General

The Bolling-Anacostia Installation occupies part of a long and relatively narrow strip of land extending between the Potomac and Anacostia rivers to the north and west, and South Capitol Street, Overlook Avenue, and I-295 to the east and south. In addition to the Installation, this stretch of riverside land contains other large institutional compounds such as the NRL facilities and the District of Columbia's Blue Plains wastewater treatment plant. Military family housing developments (Air Force Housing on Bolling AFB and Bellevue Housing) are the only residential uses within this area.

The South Capitol Street/Overlook Avenue/I-295 corridor creates a strong functional and visual break between these government

uses and the neighborhoods that lie on higher ground east of I-295, separated from the low-lying riverside plain by a wooded slope. The area east of I-295 is predominantly in residential use (Barry Farm and Congress Heights neighborhoods), though a large institutional compound - the 173-acre St. Elizabeth's West Campus, currently being redeveloped for use by the US Department of Homeland Security (DHS) - is also present, overlooking NSF Anacostia. To the north of NSF Anacostia, the shore of the Anacostia River is occupied by parkland (Poplar Point, Anacostia Park).

The Bolling-Anacostia Installation covers approximately 973 acres (351 acres for NSF Anacostia, 607 acres for Bolling AFB, and 15 acres for the Bellevue Parcel containing the alternate site), with about 3.3 miles of shoreline and 276 facilities (56 at NSF Anacostia and 220 at Bolling AFB). The Installation is surrounded by a perimeter fence and can only be accessed through one of three guarded gates: the North Gate at Firth Sterling Avenue, the Main Gate (Arnold Gate) at Malcolm X Avenue, and the South Gate, off Overlook Avenue. An unused railroad right-of-way runs along the eastern flank of much of the Installation, terminating at the Blue Plains wastewater treatment plan.

NSF Anacostia is a low-density, loosely organized facility, whose northern portion is characterized by recreational uses (ball fields) and some residential and community support functions (e.g., a small exchange, gym, and dining hall in Building 72). The southern part of NSF Anacostia, north of Defense Boulevard, is dominated by the airfield operated by HMX-1, the US Marine Corps squadron in charge of the presidential helicopters. East of the airfield, the area between Defense Boulevard and the Installation's perimeter fence along South Capitol Street is dominated by industrial, maintenance, and vehicle storage functions. The central and waterside portions of NSF Anacostia contain scattered mission/administrative uses.

Bolling AFB is characterized by similar uses but in different proportions. The southern and western-central portions of the base are dominated by residential, community support, and recreational uses. Much of the existing housing, however, is scheduled for demolition as part of its recently completed privatization. Mission/administrative functions are mostly found in the eastern-central part of the base. The northern part, adjacent to NSF Anacostia, is dominated by the Defense Intelligence Agency Center (DIAC) and associated parking facilities. Bolling AFB also has a small helicopter landing pad, just south of DIAC.

Existing land uses at the Installation create operational constraints that have to be taken into account when siting new facilities (See Appendix A). In particular, each of the two airfields has safety zones that must remain clear of obstacles. Several facilities have explosive safety quantity-distance arcs. Also, several tenant agencies have high security requirements and must be allowed to restrict physical and visual access to their facilities. These agencies include, on NSF Anacostia, HMX-1 and the White House Communication Agency; on Bolling AFB, DIAC.

Department of Defense (DoD) anti-terrorism/force protection (AT/FP) standards must be incorporated into all inhabited new construction and major renovation work funded under the Military Construction process. Standoff distance must be coupled with appropriate building hardening to provide the necessary level of protection to personnel. Where conventional standoff distances can be met, conventional construction may be used for the buildings without specific analysis of blast effects, except as otherwise required by the standards. When required distances cannot be achieved, hardening measures should be applied to mitigate the distance deficit. Current AT/FP standards are contained in United Facilities Criteria (UFC) 4-010-01.

3.1.1.2 Preferred Site

In its current condition, the preferred site consists of two fairly distinct halves. Most of the northern half is occupied by a square-shaped grassy field where Building 150 used to stand. Building 150, an administrative facility, was demolished a few years ago. Small paved parking lots (presumably once serving Building 150) remain to the north and south of the field.

The southern half of the site is occupied by several single- and double-wide trailers on an asphalt parking lot. The trailers house administrative functions. Farther south, Building 387, a semi-permanent structure surrounded by a fence, separates the site from Thomas Road. Other adjacent land uses are Building 356 and surrounding fence to the west, and a large, also fenced vehicle storage yard to the northwest and north. Brookley Avenue runs along the site's eastern edge. The preferred site is within a part of NSF Anacostia dominated by industrial, maintenance, and vehicle storage functions.

3.1.1.3 Alternate Site

The alternate site consists entirely of an open, grassed area within a larger, similarly undeveloped parcel just south of McGuire Avenue and extending southward to Magazine Road, SW. Though currently vacant, this parcel is part of Bellevue Housing, the Navy's military family housing development that extends to the east and southeast. Bellevue Housing consists of 188 townhouses built in 1996. The developed parts of Bellevue are separated from the alternate site by the unused railroad right-of-way mentioned in Section 3.1.1.1.

The alternate site is also directly across Doolittle Park, a residential area scheduled for demolition as part of the privatization of Air Force housing at Bolling AFB (See Section 3.1.2.2). Once the existing houses are demolished, that portion of Bolling AFB will become available for redevelopment. The 2008 *NSF Anacostia-Bolling AFB Joint Master Plan Phase 1 Concept Report* (see Section 3.1.2.2) shows that area as a potential "Secure Mission" use.

3.1.2 Relevant Planning Documents, Initiatives, and Projects

3.1.2.1 Washington, DC

Comprehensive Plan for the National Capital - Federal Elements - Federal Workplace

Development in the District of Columbia is guided by a number of plans and guidelines that aim to preserve Washington's unique aesthetic quality and historical heritage as the nation's capital, while accommodating and fostering demographic and economic growth. The two main planning agencies for the District of Columbia are the National Capital Planning Commission (NCPCC), which represents the Federal interest, and the District of Columbia Office of Planning (DCOP), a District agency. Transportation planning is conducted by the District of Columbia Department of Transportation (DDOT).

NCPCC and DCOP prepare the *Comprehensive Plan for the National Capital*, which provides a statement of principles, goals, objectives, and planning policies for the future growth and development of Washington, DC. The *Comprehensive Plan* has two parts: the Federal Elements, prepared by NCPCC, which contain recommendations directed at Federal lands and the Federal

interest in the National Capital Region; and the District Elements, prepared by the DCOP, which deal with non-Federal lands within the District of Columbia. The Federal Workplace Element is the part of the *Comprehensive Plan* relevant to the proposed action evaluated in this EA, which consists of relocating a Federal agency to a site on Federal property.

As stated in the Federal Workforce Element, the overall goal of the Federal government in the National Capital Region is to:

Locate the Federal workforce to enhance the efficiency, productivity, and public image of the Federal government; to strengthen the economic well-being and expand employment opportunities of the region and the localities therein; and to give emphasis to the District of Columbia as the seat of the national government.

NSF Anacostia, Bolling AFB, and NRL are three of the existing Federally-owned workplaces identified in the element. The workplace policies listed in the element that are relevant to the proposed action considered in this EA are the following:

(A) With respect to existing facilities and resources, the Federal government should:

1. Give preference to established urban areas, or areas that are under redevelopment with infrastructure and services in place, when locating Federal workplaces.
2. Support regional and local agency objectives that encourage compact forms of growth and development when locating Federal workplaces.
3. Support regional and local agency efforts to coordinate land use with the availability or development of transportation alternatives to the private automobile, including walking, bicycle riding, and public transit [...] when locating Federal workplaces.
4. Locate Federal facilities within walking distance of existing or planned fixed guideway transit services [...] Priority should be given to locations within walking distance to Metrorail due to its extensive reach into the region's residential areas.
5. Locate Federal workplaces in areas where efficiencies are gained through proximity to a market of private suppliers of goods and services.
6. Utilize available Federally-owned land or space before purchasing or leasing additional land or building space.

Agencies should continuously monitor utilization rates of land and building space to ensure their efficient use.

7. Consider the modernization, repair, and rehabilitation of existing Federally-owned facilities for Federal workplaces before developing new facilities.
8. Minimize development of open space by selecting disturbed land or brownfields for new Federal workplaces or by reusing existing buildings or sites.

(B) With respect to the regional distribution of Federal workplaces, the Federal government should:

1. Achieve within the District of Columbia a relative share of the region's Federal employment (civilian and military) that is not less than 60 percent of the region's.
2. Locate employees near other Federal agencies and departments with which they regularly interact.
3. Locate Federal workplaces in urban areas, giving first consideration to the District of Columbia and second consideration to other centralized community business areas and areas of similar character, including other specific areas that may be recommended by local agencies [...].

Additionally, the element notes that warehousing, utility, supply, and storage activities within the District of Columbia should give priority to locations that are easily accessible from the regional highway system and without negative traffic impacts to the local arterial and roadway system.

South Capitol Street Corridor Improvements

DDOT has been conducting a broad planning effort to improve conditions along the South Capitol Street corridor and turn it into an urban boulevard that can function as a symbolic gateway into the nation's capital. The study area for that project includes South Capitol Street down to a point south of Firth Sterling Avenue and is, therefore, adjacent to the northeastern part of NSF Anacostia. A Draft Environmental Impact Statement (EIS) was published for the project in January 2008.

The centerpiece of the proposed corridor improvements, and the component that is the most relevant to NSF Anacostia, is the proposed realignment of the Frederick Douglass Memorial Bridge, which carries South Capitol Street across the Anacostia River. The bridge would be widened and realigned south of its current location. Suitland Parkway and South Capitol Street would

intersect at grade just south of the realigned bridge, north of NSF Anacostia.

Anacostia Waterfront Initiative - Poplar Point

DCOP's Anacostia Waterfront Initiative (AWI) is a multi-year, multi-agency comprehensive planning effort to transform the Anacostia River into a world-class urban waterfront. "The vision of the AWI is of a clean and vibrant waterfront with parks, recreation uses and urban waterfront settings - places for people to meet, relax, encounter nature and experience the heritage of the waterfront neighborhoods. The AWI also seeks to ensure that the social and economic benefits derived from a revitalized waterfront are shared by those neighborhoods and people living along the Anacostia River for whom the river has been distant and out of reach."

The AWI's study area includes the shores of the Anacostia River to the Maryland state line. It encompasses the area immediately north of NSF Anacostia and South Capitol Street, known as Poplar Point. A development plan for Poplar Point was prepared by DCOP in 2003. The plan aims to realize Poplar Point's potential as a prime waterside recreational area and public gathering spot. An EIS is currently being prepared by the District of Columbia and the National Park Service to assess the impacts of redevelopment alternatives. The redevelopment of Poplar Point will include approximately 70 acres of parkland in perpetuity that may feature wetlands, landscaped areas, pedestrian walkways, bicycle trails, seating, open sided shelters, natural areas, recreational use areas, and memorial sites. For the remaining acreage of the 130-acre site, the District of Columbia is considering proposals for a cultural institution or museum, transit, a sports complex or stadium, and residential and commercial uses.

Redevelopment of St. Elizabeth's West Campus

In December 2008, the General Services Administration (GSA) issued a Record of Decision (ROD) for the consolidation of the DHS to the historic West Campus of St. Elizabeth, located on a hilltop across I-295 from NSF Anacostia. Under the alternative selected for implementation, 3.8 million gross square feet of office and shared-used space would be provided in both new and reused buildings on the West Campus, complemented by 750,000 gross square feet to be built on St. Elizabeth's East Campus under a Memorandum of Agreement with the District of Columbia, which controls the East Campus. Also part of the project are

transportation improvements, including changes to the Malcolm X Avenue/I-295 interchange, across from Bolling AFB's Main Gate. The interchange would be reconfigured to connect to a new road that would extend between Firth Sterling Avenue and Malcolm X Avenue and provide access to the West Campus. 2016 is the build-out date for this project.

Other Projects

- **Barry Farm Redevelopment:** the District of Columbia has issued a plan for the redevelopment of the 37-acre Barry Farm/Park Chester/Wade Road neighborhood, located between Suitland Parkway to the north, Martin Luther King Jr. Avenue to the east, Firth Sterling Avenue to the west, and St. Elizabeth's West Campus to the south. The plan aims to create a mixed income community of various housing types with a total of 1,391 housing units and a vibrant mixed-use main street at Firth Sterling Avenue. The enhancement of community facilities, provision of a pedestrian bridge across Suitland Parkway to the Anacostia Metro Station, and increasing of the community's connectivity to greater Anacostia by extending the street grid through the neighborhood are other significant elements of the plan. The target date for this redevelopment is 2018.
- **Anacostia Streetcar Project:** the District of Columbia is in the process of designing and constructing a new streetcar line that will extend between the 11th Street Bridge and the Anacostia Metro Station. The opening of the line, previously scheduled for late 2009, has recently been postponed to 2012.

3.1.2.2 Naval District Washington and Bolling AFB-NSF Anacostia

Regional Shore Infrastructure Plan

In 2005, Naval District Washington (NDW) completed a Regional Shore Infrastructure Plan (RSIP) to serve as a long-term planning tool for the installations under its purview, including NSF Anacostia. The policy objectives guiding the development of the RSIP were to (1) Reduce footprints and costs (2) Increase existing capabilities and sustainability and (3) Maximize mission efficiencies. Consistent with these objectives, the RSIP recommended four guiding concepts for future development: (1) Capitalize on joint resources (2) Sustain a high quality of life with superior service and facilities (3) Recognize NDW as a

research, development, testing, and evaluation (RDT&E) center and (4) Maximize existing facilities for highest and best use.

Anacostia Annex Site Development Plan

This plan was completed in 2004. It was prepared as a first step to guide the future development of the site in anticipation of the 2005 BRAC round, on the assumption that the installation would become a focus for new development. The plan's driving objectives were to (1) Determine the highest and best use for the site (2) Enhance the waterfront setting (3) Enhance the physical amenities for workers and visitors (4) Create a cohesive, unified level of development and (5) Upgrade the existing physical form of the site. The plan's key elements were the creation of (1) a campus core (2) a walkable campus and (3) a pattern of uses, all intended to better integrate the installation and provide stronger physical and functional focuses.

NSF Anacostia-Bolling AFB Joint Base Master Plan - Phase 1 - Concept Report

BRAC 2005 called for the unification of NSF Anacostia and Bolling AFB into one joint base under NDW. To guide compliance with this mandate and consistent with DoD's *Supplemental Guidance for Implementing and Operating a Joint Base for Real Property Matters* (15 April 2008), the Navy has initiated preparation of a joint base master plan. Phase 1 of the project, completed in December 2008, created a concept plan to aid in the development of the full master plan (Phase 2, ongoing). The primary purpose of the Concept Plan is to provide data, analysis, and considerations that will serve as a basis for further study and in-depth planning. It provides guidance for, but does not determine or bind, the future joint base master plan. Main areas of consideration include sustainability, land use, parking and density, and multi-modal transportation. The Concept Plan includes three land use planning options. Under all options, the preferred site for the proposed NSMA facility is within an area mapped for mission/administrative uses. This area is bounded by the installation's boundary to the east, Thomas Road to the south, Mitcher Road and Defense Boulevard to the west, and Defense Boulevard to the north. The area immediately south across Thomas Road from the preferred site, is mapped for industrial use. At the southern end of the installation, the area across McGuire Avenue from the alternate site is mapped as a "secure mission" area, that is an area proposed for facilities with special security and perimeter requirements.

Bolling AFB Housing Privatization

Housing on Bolling AFB has recently been privatized under the Air Force Privatization Program. As part of this privatization, a total of 782 existing units will be demolished, 119 new units will be built, and 47 units will be renovated, for an end-state of 670 units (The Landings at Bolling). As part of this project, the housing area just across McGuire Avenue from the alternate site, Doolittle Park, is scheduled for demolition after residents are relocated. The parcel will then be returned to the Air Force for redevelopment. Demolition and construction activities have begun and all work is scheduled to be completed in 2012, though families may begin to move into some of the new units in early 2011.

Bellevue Housing Privatization

The Navy's Bellevue Housing development is in the process of being privatized along with other Navy family housing within NDW as part of a Public/Private Venture (PPV). Under the PPV, ownership of the housing units will be transferred to a limited liability company (LLC), which will lease the underlying land from the government for approximately 50 years. The Bellevue conveyance area encompasses approximately 65 acres, including the triangle-shaped parcel within which the alternate site is located. Other than the unit ownership transfer and land lease, no change would be made at Bellevue Housing as part of the project. All existing units would remain and no new units would be constructed.

3.1.2.3 Design Reviews

Two Federal agencies review and approve Federal construction projects in the District of Columbia:

- NCPC, which is the Federal government's central planning agency for Federal land and buildings in the National Capital Region. NCPC reviews a wide range of plans and projects from memorials and museums to new Federal office buildings to communications towers and perimeter security projects. Through its review, NCPC ensures that Federal development meets the highest design standards and complies with the Commission's policies, including the *Comprehensive Plan for the National Capital: Federal Elements*.
- The Commission of Fine Arts (CFA). Established in 1910, CFA is charged with giving expert advice to the President,

Congress, and the heads of departments and agencies of the Federal and District of Columbia governments on matters of design and aesthetics, as they affect the Federal interest and preserve the dignity of the nation's capital.

3.2 Socioeconomics

3.2.1 Demographic and Economic Profile

The Bolling-Anacostia Installation is located in Ward 8 of Washington DC. Ward 8 is one of the two city wards located south of the Anacostia River. The Installation is within Census Tract (CT) 73.1; census tracts immediately east of the Installation (across South Capitol Street and I-295) include, from north to south: CT 74.01; CT 98.09; CT 73.02; and CT 98.07. These five census tracts constitute the demographic study area for this EA. It should be noted, however, that CT 98.09 coincides with the East and West campuses of St. Elizabeth's Hospital; as such, data for this tract are not representative of the local community.

Table 3-1 summarizes Census 2000 demographic information for Washington, DC, Ward 8, and the demographic study area.

As can be seen, both Ward 8 and the four census tracts across I-295 from the Installation are home to a large majority of African-Americans. The contrasting racial make-up of CT 73.1, which is closer to the general US population's than to the District's, Ward 8's, or the neighboring census tracts', likely reflects the presence there of a substantial amount of military housing (Bellevue, Bolling), with a more transient and diverse resident population.

Census 2000 data also suggest that the demographic study area is home to a higher proportion of children and youths (under 18 years of age) than the District of Columbia as a whole, also a characteristic of Ward 8. In this respect, CT 73.01 is not significantly different from the rest of the study area, which likely reflects the presence of military family housing on the Installation. Most housing is located at or near the south end of the Installation, far from the proposed site but surrounding the alternate site to the north and east (however, Doolittle Park, the residential parcel directly north of the site, across McGuire Avenue, is scheduled for demolition and redevelopment for yet to be determined non-residential functions).

Table 3-1
Demographic Profile (Census 2000)

Area	Total	White	African-American	Other Races	Hispanic ¹	Under 18
Washington, DC	572,059	176,101 30.8%	343,312 60%	52,646 9.2%	44,953 7.9%	114,992 20.1%
Ward 8	70,914	3,745 5.3%	65,533 92.4%	1,636 2.3%	1,016 1.4%	25,464 35.9%
CT 73.01	5,234	3,037 58%	1,572 30%	625 2%	442 8.4%	1,955 37.3%
CT 74.01	2,996	14 0.5%	2,943 98.2%	39 1.3%	27 0.9%	1,346 44.9%
CT 98.09	723	107 14.8%	593 82%	23 3.2%	14 1.9%	25 3.4%
CT 73.02	3,261	63 1.9%	3,123 95.8%	75 2.3%	42 1.3%	922 28.3%
CT 98.07	3,238	54 1.7%	3,136 96.8%	48 1.5%	28 0.9%	878 27.1%
All five CTs	15,452	3,275 21.2%	11,367 73.6%	810 5.2%	553 3.6%	5,126 33.2%
1 Can be of any race.						
Source: DCOP, Census 2000 Demographic Profiles < http://www.planning.dc.gov >						

Post-Census 2000 estimates indicate that the population of Washington DC has been increasing (the estimate for July 2007 is 588,292) and that the non-Hispanic white population has increased relative to other racial and ethnic groups. In 2007, this population was estimated to represent about 32.5 percent of the District's residents (data available on the website of the DC Office of Planning). No Ward- or CT-levels estimates are available. However, the District-wide demographic changes just summarized are not of such scope as to have significantly changed the demographic characteristics of the study area.

Economic data characterizing the study area, along with Ward 8 and Washington, DC as a whole for comparison, are presented in Table 3-2.

Table 3-2
Economic Profile (Census 2000)

Area	Median Household Income (\$)	Per Capita Income (\$)	Poverty (individuals)
Washington, DC	40,217	28,659	20.2%
Ward 8	25,017	12,630	36%
CT 73.01	49,122	16,522	2.5%
CT 74.01	14,083	6,453	57.7%
CT 98.09 ¹	0	6,625	77.8%
CT 73.02	32,791	17,211	22.5%
CT 98.07	30,076	18,956	19.1%

1. As noted above, CT 98.09 coincides with St. Elizabeth's Hospital. Therefore, data for this CT are outliers and not representative of the local community.

Source: DCOP, Census 2000 Demographic Profiles
<<http://www.planning.dc.gov>>

Based on these data, the study area is substantially poorer than the District of Columbia as a whole, though somewhat more prosperous than Ward 8 as a whole. Outliers are CT 98.09 and CT 73.01. CT 98.09 encompasses St. Elizabeth's Hospital and, as such, is not representative of the local situation. Nor is CT 73.01, though for a different reason: economic data for this tract likely reflect that most or all of its residents are military personnel families associated with Bolling-Anacostia or other military installations in the area.

3.2.2 Environmental Justice and Protection of Children

Signed on February 11, 1994, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs all Federal departments and agencies to incorporate environmental justice considerations in achieving their mission. Each Federal department or agency is to accomplish this by conducting programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude communities from participation in, deny communities the benefits of, nor subject communities to discrimination under such actions because of their race, color, or national origin.

According to CEQ guidance on EO 12898, "minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis [...] Low-income populations in an affected area should be identified using the annual statistical poverty thresholds from the Bureau of the Census."

Based on the data presented in Section 3.2.1, the demographic study area qualifies as an Environmental Justice community on both racial and economic grounds.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was signed on April 21, 1997. Because the scientific community has recognized that children may suffer disproportionately from environmental health and safety risks, the EO directs Federal agencies to identify and assess such risks, and consequently to ensure that their policies, programs, activities, and standards address effects on children. "Environmental health and safety risks" are defined as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest." Regulatory actions that are affected by this EO are those substantive actions that involve an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children.

As the demographic data summarized in Section 3.2.1 indicate, the proportion of persons under 18 years of age is higher in the population of the demographic study area than it is in the population of the District of Columbia as a whole, particularly in CT 73.01, which contains the Installation. The underage residents of this tract are most likely concentrated in the southern part of the Installation, in the Bellevue and Bolling military family housing areas. Both Bolling AFB and NSF Anacostia have Child Development Centers (CDCs). NSF Anacostia's is located near the northern tip of the property, off Robbins Road. Bolling AFB's CDC is in the west-central part of the base. Neither CDC is close to either of the sites being considered.

3.3 Transportation

Access to the Bolling-Anacostia Installation is primarily via mass transit or personal motor vehicle. Because of the location of the Installation and lack of easy and safe pathways, pedestrian and bicycle access can be considered minor.

3.3.1 Transit Access

Regional transit access is via Metrorail or Metrobus.

3.3.1.1 Metrorail

The nearest Metrorail station to the Installation is the Anacostia Station, near the intersection of Firth Sterling Avenue and Howard Road, SE. The most direct route from the station to the Installation (via the North Gate) is along Firth Sterling Avenue. The walking distance is a little more than half a mile. This distance is slightly above the upper limit that NCPC, in the *Transportation Element* of the *Comprehensive Plan for the National Capital*, considers a reasonable walking distance between a Metrorail station and a place of employment (from 2,000 feet to half a mile). Additionally, there is no continuous sidewalk along Firth Sterling Avenue between the station and the gate: past the intersection with the Suitland Parkway, pedestrians must walk on the side of the road or on grass. On their way, Installation-bound pedestrians must cross the Suitland Parkway and South Capitol Street. There is a crosswalk across the Suitland Parkway, but according to the DDOT Traffic Services Administration, this is a high pedestrian accident intersection. There is no crosswalk at all across South Capitol Street. Finally, the reputation of the surrounding neighborhood as a high-crime area is likely to further discourage potential Metrorail users who would have to walk between the station and the Installation in the morning and the evening.

Shuttle service between the Metrorail station and the Installation via the North Gate partly mitigates this situation. One shuttle is run by the Defense Intelligence Agency (DIA), but it is limited to DIA employees. Another shuttle is run by the Air Force between 5:25 and 9:15 in the morning and 3:10 and 6:48 in the evening, with 20-minute headways. The shuttle stops at several places on NSF Anacostia and Bolling AFB. The closest stop to the preferred site is Stop #4, near the intersection of Thomas Road and Brookley Boulevard, SW. The ride between the

Metrorail station and Stop #4 takes between 20 and 30 minutes, depending on the direction. The shuttle also stops near Building 168 (Stop #1). There is no stop within walking distance of the alternate site. The attractiveness of the Air Force shuttle service is diminished by the lack of mid-day service, which may leave employees stranded. The DIA and the Air Force shuttles both operate under waivers from DoD transportation regulations that prohibit the use of government transportation between residences and workplaces.

3.3.1.2 Metrobus

Seven Metrobus lines run along South Capitol Street and have stops near the Installation. Information on these lines is provided in Table 3-3.

Table 3-3
South Capitol Street Bus Lines

Line	Between...	And...	Weekday Schedule	Restrictions
P-17	Fort Washington Park, MD	Eye and 17 th Streets, NW, DC	NB: 4:50-8:45 AM SB: 2:57-6:54 PM	NB: Inside the Beltway, alight only SB: Inside Beltway, board only.
P-18	Fort Washington Park, MD	Anacostia Metro Station	NB: 9:25 AM-2:30 PM SB 9:39 AM-2:30 PM	
P-19	Fort Washington Park, MD	Eye and 17 th Streets, NW, DC	NB: 5:37-8:30 AM SB: 3:42-6:04 PM	NB: Inside the Beltway, alight only SB: Inside Beltway, board only.
W-4	Anacostia Metro Station	Cooper Lane and Annapolis Road, MD	NB: 5:03 AM-1:09 AM SB: 5:09 AM (Deanwood Metro Station)- 2:02 AM (Deanwood Metro Station)	
W-13	Old Fort Road and Indian Head Highway, MD	Eye and 17 th Streets, NW, DC	NB: 4:55-7:49 AM SB: 3:35-6:40 PM	NB: North of the Beltway, alight only SB: North of the Beltway, board only.
W-14	Allentown and Old Fort Roads, MD	Anacostia Metro Station	NB: 8:54 AM-2:59 PM SB: 10:14 AM-3:19 PM	
A-9	Southern Avenue and South Capitol Street, SE, DC	D and 7 th Street, NW, DC	NB: 5:55-8:55 AM SB: 3:13-6:48 PM	
Source: WMATA Website < http://www.wmata.com/bus/ >				

Only Line W-4 provides service throughout the day. Line W-4 serves the Main Gate at South Capitol Street and Malcolm X Avenue, and the North Gate at South Capitol Street and Firth Sterling Avenue. So does Line A-9, but on a much more limited schedule since, like the other lines, it only provides rush-hour service. With the exception of Line W-4, the bus lines that run along South Capitol Street near the Installation are primarily designed to move people between downtown Washington and the Maryland suburbs during peak periods.

3.3.2 Vehicular Access

3.3.2.1 Regional and Local Access

Regional vehicular access to the Installation from the west and south is via I-395 and I-295, which, to the south, connect to I-495 (the Capital Beltway) in Virginia and Maryland, respectively. To the north, I-395 and I-295 are connected by the Southwest-Southeast Freeway, which extends between the 14th Street and the 11th Street Bridges.

Regional access from the north and east is via South Capitol Street, the Suitland Parkway (which connects to South Capitol Street via Firth Sterling Avenue, SE), and the Anacostia Freeway (DC 295, which connects with I-295 at the 11th Street Bridge). South Capitol Street and I-295 run parallel immediately east of the Installation. From South Capitol Street, the Installation can be reached directly or via Overlook Avenue, SW. From I-295, the Installation is reached via Malcolm X Avenue, SE.

Vehicles enter the Installation through one of three guarded gates: the North Gate at South Capitol Street and Firth Sterling Avenue; the Main Gate (Arnold Gate) at South Capitol Street and Malcolm X Avenue; and the South Gate, off Overlook Avenue. The Main Gate is the busiest of the three gates: for instance, on November 18, 2008, between 5:00 AM and 9:30 AM, a total of 3,491 vehicles entered the Installation through the Main Gate, as opposed to 1,641 through the North Gate and 2,349 through the South Gate.

3.3.2.2 Study Intersections

A study was conducted to assess the potential vehicular traffic impacts of the proposed action on six intersections in the vicinity of the Installation (the study intersections). The study intersections are (see also Figure 3-1):

1. South Capitol Street southbound and Malcolm X Avenue (signalized)
2. South Capitol Street northbound and Malcolm X Avenue (signalized)
3. I-295 off-ramp at Malcolm X Avenue, SE (un-signalized)
4. South Capitol Street and Firth Sterling Avenue (signalized)
5. Overlook Avenue, SW at the South Gate (signalized)
6. Overlook Avenue, SW at Chesapeake Street, SW (signalized).

Study intersections #1 to 3 provide access to the Main Gate; study intersection #4 provides access to the North Gate; study intersections #5 and 6 provide access to the South Gate. These are the intersections that would be most impacted by the traffic generated by the proposed action.

3.3.2.3 Roadway Inventory

The study intersections connect with each other a total of six roadways, briefly characterized below:

- The **I-295** section of the Anacostia Freeway is classified as an interstate highway. It branches off the Southeast-Southwest Freeway in Northeast DC, crosses the Anacostia River on the 11th Street Bridge, then runs southward to the Capital Beltway (I-495) near the Woodrow Wilson Bridge in Prince George's County, Maryland. To the northeast, the I-295 section of the Anacostia Freeway connects with the DC 295 section, providing access to the Baltimore-Washington Parkway and US 50. The speed limit is 50 miles per hour (MPH). Annual Daily Traffic (ADT) is 85,000 vehicles.
- **South Capitol Street** is classified as an expressway south of M Street and along the Frederick Douglass Memorial Bridge over the Anacostia River, where it continues south, parallel to I-295. The classification of the roadway changes from expressway to minor arterial south of the intersection with Firth Sterling Avenue, SE. The posted speed limit is 35 MPH north of Firth Sterling Avenue and 40 MPH south of it. ADT is 52,750 vehicles.
- **Firth Sterling Avenue, SE** is a four-lane collector road that runs southwest to northeast between South Capitol Street and Howard Road, SE. This road is a main route for motorists and pedestrians traveling between NSF Anacostia, the Anacostia Metrorail station, and Historic Anacostia. The speed limit on Firth Sterling Avenue is 25 MPH. ADT is 10,600 vehicles.

Study Intersections



- Navy Perimeter
- Bellevue Housing
- Preferred Site (Anacostia Alternative)
- Alternate Site (Bellevue Alternative)

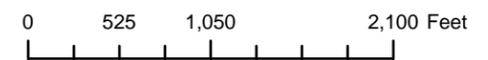


Figure 3-1

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- **Malcolm X Avenue, SE** is a two- to four-lane urban minor arterial that runs east-west and extends from 8th Street on the east, across Martin Luther King Avenue, to South Capitol Street. At its west end with South Capitol Street, Malcolm X Avenue connects directly with the Installation's Main Gate. The speed limit along Malcolm X Avenue is 30 MPH. Parking is allowed on both sides of Malcolm X Avenue east of the I-295 on/off ramps. ADT is 12,800 vehicles.
- **Overlook Avenue, SW** is a two- to four-lane collector road that runs north-south and parallel to I-295 between South Capitol Street (where South Capitol Street turns southeastward) and the Blue Plains wastewater treatment plant. The speed limit along Overlook Avenue, SW is 30 MPH. ADT is 13,000 vehicles.
- **Chesapeake Street, SW** is a four-lane collector road that runs east-west between 1st Street, SE and Overlook Avenue SW. Chesapeake Street, SW provides access to the Installation's South Gate via Overlook Avenue. The speed limit along Chesapeake Street, SW is 30 MPH. ADT is 10,600 vehicles.

3.3.2.4 Existing Traffic Conditions

To determine existing traffic conditions, manual traffic turning movement counts were taken on Tuesday March 17 and Wednesday March 18, 2009, during the AM (6:30-8:30) and PM (3:30-5:30) peak periods at the six study intersections. The AM and PM peak hours were determined based on these peak-period counts. The counts were analyzed to determine the four highest consecutive 15-minute volumes (the peak hour) during each peak period. The peak hours were found to be:

- AM Peak Hour: 7:00-8:00 AM
- PM Peak Hour: 4:15-5:15 PM

ADT volumes for roadway links were derived from 2007 traffic volumes available from DDOT, adjusted for 2009 using an annual growth rate of + 2 percent. The ADT of a roadway is the typical daily traffic volume in both directions.

Using the existing traffic volumes, the six study intersections were analyzed consistent with the procedures set forth in the Highway Capacity Manual (HCM), Transportation Research Board, Updated 2000. The Highway Capacity Software (HCS) program was used to determine operational levels of service (LOS). Existing traffic signal timings were used for the analysis.

LOS is a measurement of traffic flow in terms of speed and travel time, freedom to maneuver, comfort, and convenience. There are six LOS, designated by the letters A through F, with LOS A representing the best operating conditions and LOS F the worst. LOS for intersections are measured in terms of vehicle delay, with somewhat different values for signalized intersections and un-signalized ones, as shown in Table 3-4.

Table 3-4
LOS: Definition

Signalized Intersections		Un-signalized Intersections	
LOS	Vehicle Delay (Seconds)	LOS	Vehicle Delay (Seconds)
A	Less than 10	A	Less than 10
B	>10-20	B	>10-15
C	>20-35	C	>15-25
D	>35-55	D	>25-35
E	>55-80	E	>35-50
F	More than 80	F	More than 50

The LOS for a signalized intersection reflects the average delay for the entire intersection or the delay for individual movements. For un-signalized intersections, the LOS reflects the delay for side street traffic attempting to enter the mainline. The study intersections are all signalized, except intersection #3.

Additional results provided by the computer model are the delay per vehicle in seconds, and the volume/capacity (v/c) ratio. The v/c ratio is a comparison between the volume of traffic entering the intersection from one or all approaches and the possible capacity of one or all approaches.

An LOS C or better is the desirable goal for a roadway facility. However, in major urban areas such as Washington, DC, LOS D is considered acceptable. LOS E and F are generally considered unacceptable.

A summary of the existing LOS for the six study intersections, including delay and v/c ratios, is shown in Table 3-5. The analysis shows that all six intersections operate at overall LOS C or better. The complete traffic impact study can be found in Appendix C.

Table 3-5
LOS: Existing Conditions

Intersection		AM Peak Hour			PM Peak Hour			Type
#	Location	v/c Ratio	Delay(secs)	LOS	v/c Ratio	Delay(secs)	LOS	
1	South Capitol St. northbound and Malcolm X Ave.	0.30	24.3	C	0.36	11.0	B	Signalized
2	South Capitol St. southbound and Malcolm X Ave.	0.77	22.1	C	0.77	17.3	B	Signalized
3	I-295 off ramp at Malcolm X Ave. SE	-	16.8	C	-	16.8	C	Un-signalized
4	South Capitol St. at Firth Sterling Ave.	0.54	22.2	C	0.91	33.5	C	Signalized
5	Overlook Ave. SW at South Gate	0.35	15.6	B	0.29	13.3	B	Signalized
6	Overlook Ave. SW at Chesapeake St. SW	0.41	12.4	B	0.39	9.9	A	Signalized

3.3.3 Parking

There are numerous parking facilities scattered throughout the Installation, including two two-story parking garages located near the intersection of Thomas Road and Defense Boulevard. While some parking areas are reserved for specific agencies or buildings, other are open to all Installation employees. However, drivers can be expected to use only parking within reasonable walking distance of their final destination. This distance varies with the driver's purpose and the duration and destination of the trip. For example, workers usually are willing to walk longer distances to their destination than are shoppers; also, the acceptable walking distance is generally greater when a garage is available. For the purposes of this EA, the acceptable walking distance from parking to final

destination (the proposed NSMA facility) can be estimated to be 0.25 mile, or a 5-minute walk.

Based on parking supply and utilization data obtained from the draft *Bolling AFB Transportation Management Plan* (2009) amended based on information provided by the NSF Anacostia Department of Public Works (NSF Anacostia DPW, September 2, 2009), there are 832 available parking spaces within 0.25 mile of the preferred site (this number excludes parking reserved for specific agencies or users as well as handicapped parking). Of these spaces, from 501 to 463 were found to be unoccupied during the mid-day period. Fourteen of the 832 spaces are located on the preferred site, with a utilization rate ranging from 21 percent in mid-morning to 71 percent in mid-afternoon. The draft *Bolling AFB Transportation Management Plan* shows no available parking within 0.25 mile of the alternate site.

3.4 Air Quality

3.4.1 National Ambient Air Quality Standards

The US Environmental Protection Agency (USEPA), under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six air pollutants, referred to as criteria pollutants (40 CFR 50). These are carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀: diameter equal to or less than 10 micrometers, and PM_{2.5}: diameter equals to or less than 2.5 micrometers), lead (Pb), and sulfur dioxide (SO₂). The NAAQS include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. Table 3-6 shows the primary and secondary standards.

Table 3-6
National Ambient Air Quality Standards

Pollutant and Averaging Time	Primary Standard		Secondary Standard	
	$\mu\text{g}/\text{m}^3$	ppm	$\mu\text{g}/\text{m}^3$	ppm
Carbon Monoxide				
8-hour concentration	10,000 ^a	9 ^a	-	
1-hour concentration	40,000 ^a	35 ^a		
Nitrogen Dioxide				
Annual arithmetic mean	100	0.053	Same as primary	
Ozone				
8-hour concentration	147 ^b	0.075 ^b	Same as primary	
Particulate Matter				
<u>PM_{2.5}</u> :				
Annual arithmetic mean	15 ^c	-	Same as primary	
24-hour maximum	35 ^d	-		
<u>PM₁₀</u> :				
24-hour concentration	150 ^a	-		
Lead				
Quarterly arithmetic Mean	1.5	-	Same as primary	
Sulfur Dioxide				
Annual arithmetic mean	80	0.03	-	-
24-hour concentration	365 ^a	0.14 ^a	-	-
3-hour concentration	-	-	1300 ^a	0.50 ^a
Notes:				
^a Not to be exceeded more than once per year on average over 3 years.				
^b 3-year average of the 4th highest 8-hour concentration may not exceed 0.075 ppm.				
^c Based on 3-year average of annual averages.				
^d Based on 3-year average of annual 98th percentile values.				
Source: 40 CFR 50.				

3.4.2 National Ambient Air Quality Standard Attainment Status

Areas that meet the NAAQS for a criteria pollutant are designated "in attainment." Areas where a criteria pollutant level exceeds the NAAQS are designated "nonattainment" areas. O₃ nonattainment areas are further categorized based on the severity of their pollution problem - marginal, moderate, serious, severe, or extreme. CO and PM₁₀ nonattainment areas are categorized as moderate or serious. A maintenance area is one that has been re-designated an attainment area from a previous nonattainment status and has an approved maintenance plan under Section 175 of the CAA. When insufficient data exist to determine an area's

attainment status, it is designated unclassifiable, or in attainment.

The proposed action evaluated in this EA would take place in Washington, DC, a moderate nonattainment area for O₃, a nonattainment area for PM_{2.5}, and an attainment area for all other criteria pollutants.

3.4.3 State Implementation Plans

The CAA, as amended in 1990, mandates that state agencies adopt state implementation plans (SIPs) that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the standards.

The SIPs currently applicable to the Washington, DC nonattainment area are the *Plan to Improve Air Quality in the Washington, DC-MD-VA Region, State Implementation Plan for 8-Hour Ozone* (MWCOG, May 23, 2007) and the *Plan to Improve Air Quality in the Washington, DC-MD-VA Region, State Implementation Plan (SIP) for Fine Particle (PM_{2.5})* (MWCOG, March 7, 2008).

The O₃ SIP is a plan to improve air quality in the Washington, DC region to meet the eight-hour O₃ standard by 2009. It consists of a Reasonable Further Progress Plan, 2002-2008; an attainment plan; an analysis of reasonably available control measures; an attainment demonstration; contingency plan for attainment; and mobile source budgets for 2008, 2009, and 2010. The plan establishes a base year inventory for 2002 and projected inventories for 2008 and 2009.

The PM_{2.5} SIP is a plan to demonstrate continued improvement and compliance with the 1997 NAAQS for PM_{2.5} in the Washington region in 2009. The Plan consists of base year inventories for 2002, projection inventories for 2009, an attainment plan, a demonstration of reasonably available control measures, motor vehicle emission budgets for 2009 and 2010, attainment demonstration, and contingency plans for attainment.

3.4.4 Local Ambient Air Quality

Ambient air quality conditions in the Washington, DC area are monitored at many locations. The most recent available data (for the year 2008) from nearby monitoring stations are used here to

describe existing ambient air quality in the project area. These data are shown in Table 3-7. All measurements are below the standards, with the exception of O₃, consistent with the region's status as a nonattainment area for this pollutant. For PM_{2.5}, the readings provided in Table 3-7 are below the NAAQS, although the region as a whole is in nonattainment for this criteria pollutant. This reflects the improvement toward achieving the standard that has taken place over the past few years.

Table 3-7
Local Ambient Air Quality

Pollutant and Averaging Time	Monitored Data	Primary Standard	Secondary Standard	Monitoring Site Location
Carbon Monoxide 8-hour maximum (ppm) 1-hour maximum (ppm)	3.0 2.6	9 35	9 35	34 th Street and Dix Street, NE
Nitrogen Dioxide Annual arithmetic mean (ppm)	0.014	0.053	0.053	2500 1 st Street, NW
Ozone 8-hour 3-yr, 4 th maximum average (ppm)	0.086	0.075	0.075	2500 1 st Street, NW
Particulate Matter (PM _{2.5}) Annual arithmetic mean (µg/m ³) 24-hour maximum (µg/m ³)	12.2 32.8	15 35	15 35	Park Services Office 1100 Ohio Drive
Particulate Matter (PM ₁₀) 24-hour maximum (µg/m ³)	30.00	150	150	34 th Street and Dix Street, NE
Sulfur Dioxide Annual arithmetic mean (ppm) 24-hour maximum (ppm) 3-hour maximum (ppm)	0.006 0.031 0.035	0.03 0.140 -	- - 0.500	34 th Street and Dix Street, NE
Source: USEPA Air Data: http://www.epa.gov/air/data/geosel.html				

3.4.5 2008 Air Emission Inventory at NSF Anacostia

Various stationary sources at NSF Anacostia emit air pollutants, including diesel generators and boilers. Based on the type of pollutant emitted, the CAA sets forth permit rules and emission standards for sources of certain sizes. The USEPA oversees programs for stationary-source operating permits (Title V) for new or modified major stationary source construction and operation. NSF Anacostia is classified as a major source and operates under a Title V permit (#011). The estimated on-base annual emissions from stationary sources reported in the most recent Title V permit renewal are summarized in Table 3-8, along with the thresholds for major source designation. Actual emissions are well below the potential to emit or the major

source thresholds (status as a major source is based on the potential to emit, not actual emissions).

Table 3-8
Estimated 2008 Emissions at NSF Anacostia
(Tons per Year)

Pollutant	Actual	Potential	Major Source Thresholds
Carbon Monoxide (CO)	3.3	111	100
Nitrogen Oxides (NO _x)	4.3	191	50
Particulate Matter (PM)	0.34	18	100
Sulfur Oxides (SO _x)	0.58	206	100
Volatile Organic Compounds (VOC)	0.25	12	50

3.4.6 Clean Air Act Conformity

The Clean Air Act Amendments (CAAA) of 1990 expand the scope and content of the CAA's conformity provisions in terms of their relationship to a SIP. Under Section 176(c) of CAAA, a project is in "conformity" if it corresponds to a SIP's purpose of eliminating or reducing the severity and number of violations, and achieving the expeditious attainment, of the NAAQS. Conformity further requires that such activities would not:

- Cause or contribute to any new violation of any standard in any area.
- Increase the frequency or severity of any existing violation of any standard in any area.
- Delay the timely attainment of any standard or any required interim emission reduction or other milestone in any area.

The USEPA published final rules on general conformity (40 CFR Parts 51 and 93 in the *Federal Register* on November 30, 1993) that apply to Federal actions in nonattainment areas. The rules specify *de minimis* (threshold) emission levels by pollutant to determine the applicability of conformity requirements for a project. In this case, the project area is located in a moderate nonattainment area for O₃ in an O₃ transport region and a nonattainment area for PM_{2.5}. The applicable *de minimis* are 100 tons per year (tpy) (91 metric tpy) for NO_x, PM_{2.5}, and SO₂ (as PM_{2.5} precursor) and 50 tpy

of volatile organic compounds (VOC; NO_x and VOC are precursors of O₃).

3.5 Noise

The main sources of noise at the Bolling-Anacostia Installation are on-base military helicopter operations; commercial aircraft operations at Ronald Reagan-National Airport (DCA), across the Potomac River from the Installation; and vehicular traffic, particularly on South Capitol Street and I-295. Secondary sources of noise include on-base traffic and equipment operation. Outside the Installation, highway and street traffic is the major noise source.

Helicopter operations at the Air Force helipad or the HMX-1 airfield are sporadic and not a steady source of noise. While noise from DCA is steady, review of the airport's 2004 FAR Part 150 Noise Exposure Maps (both "existing" for 2000-2001 and projected for 2009) indicates that the Installation and nearby neighborhoods are well outside the 65-dBA day-night average level (DNL) contour, the accepted threshold for incompatibility with residential land uses. This is in contrast with the conditions described by the previous noise maps (developed in 1990 and describing 1989 conditions), which showed the 65-dBA contour extending over a substantial portion of Bolling AFB (but not outside the base). The improvement is attributable to the replacement of noisier aircraft by quieter ones and the implementation of noise-reducing measures. The 2004 Part 150 study's noise exposure grid maps show DNL on the Installation to be in the 60-50 dBA range.

3.6 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to integrate consideration of historic preservation issues into the early stages of their planning projects. Under Section 106, the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or Federally-financed undertaking is required to account for the effects of this undertaking on any district, site, building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places. Eligibility determinations are based on National Register criteria for architectural integrity. Section 106 consultation in the

District of Columbia is conducted with the DC Historic Preservation Office (DCHPO).

3.6.1 NSF Anacostia and the Preferred Site

The only historic properties in the general vicinity of the preferred site are Buildings 168 and 169, eligible for listing in the National Register of Historic Places. Neither building is adjacent to the site. With regard to archaeology, the northern half of the preferred site was previously occupied by Building 150, now demolished; the southern half is occupied by parking lots and a temporary building (Building 387). Thus, past construction and demolition activities have disturbed the site and there is little potential for any archaeological resources to be present.

3.6.2 Bolling AFB/Bellevue Housing and the Alternate Site

Bolling AFB contains a historic district, the Bolling Field Historic District, eligible for listing in the National Register. The district includes 75 buildings dating from 1933-1945. It extends between the eastern boundary of the property and Brookley Avenue from just north of the Main Gate down to and inclusive of the Westover housing area. In addition to this historic district, Bolling AFB contains areas with significant potential for prehistoric and historic archaeological resources. According to the EA prepared in 2001 for the construction of DIAC, twenty-three archeological sites have been identified on the property.

In 1994, the Navy conducted a Phase 1b archaeological survey of the portion of Bellevue Housing located west of the abandoned railroad right-of-way that runs along the eastern edge of the Installation. This work was performed to support the proposed demolition of the housing units then present on the property (these units dated back to 1941 and have since been demolished). The alternate site considered for the proposed NSMA facility is within the area that was surveyed.

One shovel test - Location 19 - yielded historic and prehistoric material. Location 19 was interpreted as previously-identified Site 51SW7, originally thought to be located farther west. While no further work was recommended with regard to the historic

component of the site, the survey report concluded that the prehistoric component retained integrity and was potentially eligible for listing in the National Register. Phase II evaluation was recommended for any project that would disturb the site. Based on the map contained in the 1994 report, Site 51SW7 is within or adjacent to the alternate site. (Historic and prehistoric material was recovered at two other survey locations, to the west and south of Site 51SW7, but no further work was recommended for these isolated finds.)

No architectural surveys have been conducted at Bellevue Navy Housing. Per information provided in the draft EA for the privatization of Bellevue and other Navy housing, the Navy has evaluated the eligibility of Bellevue's 188 units and associated facilities. Bellevue Navy Housing was completed in 1996. Based on available background information, the Navy concluded that the housing units and supporting facilities do not have the exceptional historical or architectural merit that would allow them to meet the National Register criteria applying to buildings less than 50 years old.

3.7 Natural Resources

3.7.1 Geology, Topography, and Soils

3.7.1.1 General

The Installation is located in the Atlantic Coastal Plain physiographic province, at the confluence of the Potomac and Anacostia rivers. The geology of the coastal plain is characterized by alternating layers of marine and terrestrial sediments consisting of gravel, sands, silts, and clays deposited on an eroded crystalline basement rock surface.

The Installation is generally flat with no significant topographic features. Elevations range from near sea level along the shoreline to approximately 25 feet. The higher points are generally the artificial result of filling.

Most of the Installation's soils consist of fill and altered soils classified as Udorthents or Urban Land by the Natural Resources Conservation Service (NRCS). The fill consists of unconsolidated materials and materials from past excavations and dredging. Its potential to support construction and landscaping is limited. Many existing facilities have experienced settling and separation of the different facility elements. Special

foundation design is required for most building loads. Other soil series mapped on the Installation include Christiana-Urban Land Complex; Dunning; Galestown-Urban Land Complex; Keyport Fine Sandy Loam; Melvin Silt Loam; and Muirkirk.

3.7.1.2 Preferred Site

The preferred site is flat and located in an area mapped by NRCS as Urban Land, reflecting past and existing development (demolished Building 150; parking lots). In April 2004, soil borings were taken and analyzed as part of a limited site investigation conducted to provide information on the potential presence of hazardous materials (the conclusions of this investigation are summarized in Section 3.8). Borings were taken at 14 locations across the site, to a maximum depth of 16 feet. In most spots, fill was found to a depth of approximately 3 to 4 feet, depending on the location, atop an underlying layer of lean clay all the way to the bottom of the probe. In one area in the southeastern part of the site, fill was found all the way to the bottom of the probe (GP-13). At another location (GP-6), concrete was encountered under about 4.5 feet of fill.

3.7.1.3 Alternate Site

The alternate site is flat and located in an area mapped as Galestown-Urban Land Complex by NRSC. The Galestown soil series consists of very deep, somewhat excessively drained soils on uplands. Available water capacity is moderate and shrink-swell potential is low. The water table is deeper than 6 feet. It is not a hydric soil. "Urban Land" refers to soils that are supporting roadways and other improvements. The site is currently vacant but was once part of a residential development now demolished (see Section 3.6.2).

3.7.2 Water Resources

3.7.2.1 General

The Installation is located just south of the confluence between the Anacostia River and the Potomac River. At this location, both rivers are tidally-influenced freshwater bodies. Due to the predominantly urban character of its watershed, the Anacostia River has long been characterized by poor water and sediment quality. As stated in the EIS prepared in 2007 for the replacement of the 11th Street bridges, the Anacostia River is listed as an Impaired Waterbody by the District of Columbia and

as an Impaired Water by the USEPA. Studies have shown that significant amounts of contaminants enter the Anacostia River from the Northwest and Northeast branches (whose convergence forms the river, approximately 8 miles from its mouth), and that the movement of suspended particulate matter from the upper river is likely an important contaminant transport mechanism. Movement and the rate of deposition vary according to location. South of the 11th Street bridges, the river widens and deepens sufficiently to allow energy to dissipate and remaining fine particulates to settle. This limits the transport of contaminants from the Anacostia into the Potomac River, where water quality generally is less impaired.

The Anacostia and Potomac rivers in the District of Columbia are designated for Class D (protection of human health related to consumption of fish and shellfish) beneficial use. Additional designated uses include primary and secondary contact recreation (Class A and B, respectively), and protection of aquatic life (Class C). Based on the 2000 305(b) report available on the DC Department of the Environment's website, in the area of the Installation, neither river supports the Class A or Class D uses; only the Potomac supports the Class B use; both rivers support the Class C use.

The Installation drains to the west toward the Potomac River. Runoff from impervious areas at NSF Anacostia is collected through a network of pipes, culverts, inlets, and pump stations that discharge to the Potomac and Anacostia rivers through seven outfalls. Stormwater discharges are covered by the installation's National Pollution Discharge Elimination System (NPDES) permit.

Based on the Federal Emergency Management Agency (FEMA)'s Flood Insurance Rate Map (FIRM) 110001 0025B, a portion of Bolling AFB (centered on the marina near the southwestern corner of the base) is within the 100-year floodplain while most of NSF Anacostia is within the 500-year floodplain. Flooding is controlled by a concrete seawall and earth levee that has been constructed along the shoreline. According to the 2004 *Site Development Plan* for NSF Anacostia, parts of the seawall have deteriorated and this may potentially impair flood control. During storm events, localized flooding may occur as a result of the failure of the storm sewer drains combined with the generally flat character of the property.

Review of the National Wetlands Inventory Map shows no wetlands within the boundaries of the Installation.

3.7.2.2 Preferred Site

There are no natural or artificial bodies of water on or adjacent to the preferred site, which is located on the landside edge of NSF Anacostia. The site is currently about half pervious, half impervious. Runoff from the paved portions of the site drains to the storm sewer system and ultimately to the Potomac River. Like most of NSF Anacostia, the preferred site is located within the 500-year floodplain but outside the 100-year floodplain. There are no wetlands on or adjacent to the site, part of which was previously developed (Building 150, now demolished), part of which consists of paved parking lots.

3.7.2.3 Alternate Site

There are no natural or artificial bodies of water on or adjacent to the alternate site. The site is separated from the Potomac shoreline by developed land, including a large parking lot to the northwest. The alternate site is currently entirely undeveloped and pervious. It is located outside the 100- or 500-year floodplains. It does not contain any wetlands.

3.7.3 Biological Resources

3.7.3.1 General

Past land filling and development at the Installation have resulted in the loss of any native vegetation and wildlife. The only animal and plant species likely to be encountered are those most common in urbanized waterfront areas. Most undeveloped areas are covered with grass; trees are relatively few and widely scattered. Animal species that may be present include common birds, such as the northern mockingbird (*Mimus polyglottos*), Carolina wren (*Thryothorus ludovicianus*), American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), European starling (*Sturnus vulgaris*), pigeon (*Columba livia*), Canada goose (*Branta canadensis*), and seagulls (*Larus* spp.) as well as common mammals such as the gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), and various shrews (*Sorex* spp.) and rodents.

3.7.3.2 Preferred Site

The preferred site consists of a square-shaped, grassed area surrounded by paved lots and roadways. Approximately 20 scattered trees ranging in size from 8-inch oak trees to 15-inch

evergreens to a 32-inch oak, are present on the site. The potential of the site as wildlife habitat is minimal. The larger trees may provide some perching and possibly nesting habitat for birds as well as some nesting and foraging habitat for squirrels.

3.7.3.3 Alternate Site

Like the preferred site, the alternate site has minimal potential as wildlife habitat. It consists mostly of an open, grassed parcel with a scattering of trees that may offer some marginal habitat for birds and squirrels.

3.7.3.4 Threatened and Endangered Species

No species protected under the Endangered Species Act (ESA) are known to occur at the Installation. As previously noted, the potential of the Installation and proposed project sites as wildlife habitat is minimal. However, one protected species - the shortnose sturgeon (*Acipenser brevirostrum*), listed as endangered - may occur in the Potomac or the Anacostia River in the vicinity of the Installation.

3.7.3.5 Migratory Birds

The Migratory Bird Treaty Act of 1918 is the primary legislation in the United States established to conserve migratory birds. The Migratory Bird Treaty Act prohibits the taking, killing or possessing of migratory birds unless permitted by regulation.

DoD operates under a Memorandum of Understanding with the US Fish and Wildlife Service for Migratory Bird Treaty Act coordination on activities, such as the proposed action, that are not specifically related to military readiness. The Memorandum of Understanding states that the Department of Defense shall accomplish the following prior to starting any activity that is likely to affect populations of migratory birds:

- 1) Identify the migratory bird species likely to occur in the area of the proposed action and determine if any species of concern could be affected by the activity.
- 2) Assess and document, through the project planning process, using NEPA when applicable, the effect of the proposed action on species of concern.

- 3) Engage in early planning and scoping with the US Fish and Wildlife Service relative to potential impacts of a proposed action, to proactively address migratory bird conservation, and to initiate appropriate actions to avoid or minimize the take of migratory birds.

Because of the marginal character of the habitat present on the Installation, in particular the lack of any significant amount of forest, its potential to support migratory birds is minimal. However, because of the proximity of the Potomac River, it is possible that bald eagles (*Haliaeetus leucocephalus*) may forage in the vicinity of the Installation. Recently delisted from the ESA, the bald eagle is still protected under the Migratory Bird Treaty Act as well as under the Bald and Golden Eagle Protection Act. No bald eagle nest exists on the Installation, which lacks the type of tall, mature trees favored by the eagle for nesting.

3.8 Hazardous Materials and Waste

3.8.1 General

The various activities on the Installation make use of different types of hazardous materials and produce different types of hazardous waste, including, for instance, fuels, solvents, oils, paints, organic substances, used paint, dirt contaminated with oil and other organic liquids, and batteries.

NSF Anacostia is regulated as a Large Quantity Generator (LQG) of hazardous waste under the Resource Conservation and Recovery Act (RCRA) of 1976. An LQG generates 2,200 pounds or more of hazardous waste, or more than 2.2 pounds of acute hazardous waste, per calendar month. All hazardous waste generated by the LQG that is not treated onsite must be manifested and sent to an offsite treatment, storage, and disposal facility permitted to handle hazardous waste, or sent to an approved designated facility (e.g., a recycling facility). Hazardous waste at NSF Anacostia is handled, stored, and disposed of in accordance with applicable local and Federal laws and regulations.

To satisfy the requirements of the Superfund Amendments and Reauthorization Act (SARA), which amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as well as RCRA for former and current hazardous waste sites, NSF Anacostia and Bolling AFB have been investigating and remediating hazardous waste contamination areas as part of the DoD's Environmental Restoration (ER) Program. Based on

information contained in the 2008 *NSF Anacostia-Bolling AFB Joint Base Master Plan Phase I Concept Report*, there are no active ER sites on NSF Anacostia. There are five ER sites on Bolling AFB.

3.8.2 Preferred Site

The preferred site is partially occupied by a few trailers and a semi-permanent building with primarily administrative functions. Therefore, no significant amount of hazardous materials is currently stored on the site, and no significant amount of hazardous waste is currently generated there. No ER sites are located within or adjacent to the preferred site.

In early 2008, under contract from the Navy, Schnabel Engineering LLC conducted a limited subsurface investigation of the site to provide current information on potential soil contamination. Fourteen boring locations were analyzed. All soil samples were screened for volatile organic compounds (VOCs); six soil samples were analyzed for Total Petroleum Hydrocarbons - Diesel Range Organics/Gasoline Range Organics (TPH-DRO/GRO); and two samples were analyzed for priority pollutant metals, semi-VOCs (SVOCs), and polychlorinated biphenyls (PCBs).

The analysis detected metals, TPH-DRO, and acetone (a VOC) in the samples. No SVOCs, TPH-GRO, or PCBs were detected. Results were compared to the Risk-Based Screening Levels (RBSLs) developed for the District of Columbia Department of the Environment (DDOE)'s Underground Storage Tank Program. For metal for which RBSLs do not exist, results for compared to the USEPA's Risk-Based Concentrations (RBC).

Arsenic, chromium, copper, lead, mercury, nickel, and zinc were detected in both soil samples analyzed for metals. Arsenic concentrations exceeded the RBSLs; however, Schnabel Engineering LLC stated that they believe these concentrations to be within the range naturally occurring in area soils. Chromium was measured in excess of the RBSL for chromium VI but below the RBSL for chromium III (which cannot be distinguished from chromium VI by the analysis). Chromium naturally occurs as chromium III. Schnabel Engineering LLC did not believe that the chromium concentrations encountered were due to the presence of chromium VI. All other metals were encountered at concentrations below the applicable RBSLs.

TPH-DRO was detected in the six soil samples analyzed for it, with concentrations ranging from 26 to 78 milligrams per kilogram (mg/kg), below the DDOE RBSL of 100 mg/kg. Acetone was detected at a concentration of 39 microgram/kg, below the RBSL of 48,200,000 microgram/kg.

Based on a review of soil samples recovered during a separate geotechnical investigation, Schnabel Engineering LLC noted the presence of petroleum odors with a photo-ionization detector (PID) reading of 4 parts per million (ppm) in one sample collected at 83.5 to 85 feet below grade at a boring (B-3) in the north central part of the site. The source of these odors could not be determined by the analysis but petroleum impacted soil may be present.

3.8.3 Alternate Site

The alternate site is currently undeveloped and no hazardous materials are stored there. Nor is any hazardous waste generated or stored at the site. There is no ER site within or immediately adjacent to the alternate site.

4. Environmental Consequences

This chapter describes the potential environmental impacts that would result from implementing the alternatives being considered by the Navy for the relocation of NSMA to a DoD-owned facility in the National Capital Region. When applicable, mitigation measures to minimize or avoid adverse impacts and permitting requirements are also discussed.

As explained in Chapter 2, three alternatives are being evaluated: the No Action Alternative, the Anacostia Alternative (the preferred alternative) and the Bellevue Alternative.

4.1 Land Use and Plans

4.1.1 No Action Alternative

4.1.1.1 Land Use

The No Action Alternative would have no impacts on land use at or near the Installation or on either of the sites considered under the two action alternatives. There would be no change to existing conditions as described in Section 3.1.1.

4.1.1.2 Relevant Planning Documents, Initiatives, and Projects

Generally, the No Action Alternative would not result in adverse impacts to any of the plans and projects described in Section 3.1.2. It would not impede or prevent the implementation of any planning policy, the achievement of any planning goal, or the completion of any ongoing project. Nor, however, would it actively support or promote any of these policies, goals, or projects.

4.1.2 Anacostia Alternative (Preferred)

4.1.2.1 Land Use

Implementation of the Anacostia Alternative would result in a change in land use at the preferred site. The site is currently

half-open, half-occupied by parking lots, temporary trailers, and a semi-permanent building (Building 387). The trailers and Building 387 would be moved to an on-base location to be determined. After the proposed action is completed, the site would be occupied by a combined facility, a half-administrative, half-light industrial use.

While this would represent a change in land use, the new land use would be compatible with its surroundings. The proposed facility, along with associated security requirements and stand-off distances, would be similar, in function and general appearance, to existing facilities on NSF Anacostia and Bolling AFB. It would be outside all existing restricted areas, including the safety zones associated with the nearby HMX-1 compound. Due to the moderate scale of the proposed facility, and to the functional and visual separation of NSF Anacostia from the neighborhoods to the east by South Capitol Street and I-295, there is no potential for indirect land use impacts outside the installation.

4.1.2.2 Relevant Planning Documents, Initiatives, and Projects

Comprehensive Plan for the National Capital - Federal Elements - Federal Workplace

The construction of the proposed new combined NSMA facility under the Anacostia Alternative would support most of the relevant policies of the *Federal Workplace Element* of the *Comprehensive Plan for the National Capital*, as detailed below.

9. *Give preference to established urban areas, or areas that are under redevelopment with infrastructure and services in place, when locating Federal workplaces.*

Locating NSMA to NSF Anacostia, a developed facility in the District of Columbia, would support this policy.

10. *Support regional and local agency objectives that encourage compact forms of growth and development when locating Federal workplaces.*

Constructing a combined facility with administrative and warehousing functions consolidated into one compact facility would support this policy.

11. *Support regional and local agency efforts to coordinate land use with the availability or development of transportation alternatives to the private automobile, including walking, bicycle riding, and public transit [...]*

when locating Federal workplaces.

NSF Anacostia is located in an area of the District of Columbia that is the object of multiple planning initiatives and redevelopment projects (e.g. South Capitol Street Corridor Improvements, Anacostia Waterfront Initiative), which collectively are expected to make the area more accessible to alternative transportation modes.

12. *Locate Federal facilities within walking distance of existing or planned fixed guideway transit services [...] Priority should be given to locations within walking distance to Metrorail due to its extensive reach into the region's residential areas.*

The preferred site is a little more than half a mile from the Anacostia Metrorail Station. Combined with distance, deficiencies in the existing infrastructure outside the Installation make walking from the station to the site an unattractive option for present and future NSF Anacostia workers. These issues are discussed in more detail in Section 4.3.2.1. The Navy has prepared a Transportation Management Plan (TMP) that outlines measures to encourage transit usage by NSMA employees.

13. *Locate Federal workplaces in areas where efficiencies are gained through proximity to a market of private suppliers of goods and services.*

Locating the proposed new facility in the District of Columbia would be consistent with this policy.

14. *Utilize available Federally-owned land or space before purchasing or leasing additional land or building space. Agencies should continuously monitor utilization rates of land and building space to ensure their efficient use.*

Moving NSMA from multiple leased spaces to one consolidated facility on an existing DoD installation would support this policy.

15. *Consider the modernization, repair, and rehabilitation of existing Federally-owned facilities for Federal workplaces before developing new facilities.*

The Navy considered options that would have relocated NSMA to existing Federal facilities. The reasons for which such options were not retained are explained in Section 2.2.1 of this EA.

16. *Minimize development of open space by selecting disturbed land or brownfields for new Federal workplaces or by*

reusing existing buildings or sites.

Construction of the proposed consolidated facility on the preferred site, which was previously occupied by Building 150, would support this policy.

The Anacostia Alternative would also support policies pertaining to the regional distribution of Federal workplaces by (1) moving NSMA to the District of Columbia, consistent with the policy that no less than 60 percent of the region's Federal employment be in the District and that Federal workplaces be located in urban areas and (2) moving NSMA closer to the Washington Navy Yard, consistent with the policy that employees be located near other agencies with which they interact.

Finally, the Anacostia Alternative would be consistent with locating warehousing, utility, supply, and storage activities within the District of Columbia in places that are easily accessible from the regional highway system and without negative traffic impacts to the local arterial and roadway system facilities (traffic impacts are addressed in Section 4.3.2).

On-going Plans and Projects in the District of Columbia

The proposed action under the Anacostia Alternative would have no adverse effect on the several ongoing plans, initiatives, and projects outlined in Section 3.1.2.1. Relocating NSMA to a consolidated facility at the preferred site would not create conditions that could impede or prevent the completion or success of these projects.

Naval District Washington and Bolling AFB-NSF Anacostia

The Anacostia Alternative is generally consistent with the existing RSIP for NDW facilities, the 2004 *Site Development Plan*, and the recent *NSF Anacostia-Bolling AFB Joint Base Master Plan - Phase 1 - Concept Report*. One partial exception is the following: in the *Concept Report's* proposed land use maps, the area within which the preferred site is located is mapped for Mission/Administrative use. Being partly light industrial and requiring special security features, the proposed NSMA facility may not be entirely consistent with the Mission/Administration designation. The Secure Mission designation would be more appropriate. However, as its title indicates, the *Concept Report* presents only broad concepts that can and will be modified and refined during the ongoing second phase of the joint-base master planning process. While the construction of the proposed consolidated NSMA facility on the preferred site may require

adjusting the future land use maps, it is not expected to adversely affect the effort to develop a successful master plan for the future joint base.

The Anacostia Alternative would have no effect on the privatization of Bolling or Bellevue housing.

4.1.2.3 Design Reviews

Consultation with NCPC and CFA is ongoing, consistent with the applicable review requirements for Federal projects in the District of Columbia. Implementation of the proposed action would not begin until all necessary approvals have been obtained.

4.1.3 Bellevue Alternative

4.1.3.1 Land Use

Implementation of the Bellevue Alternative would result in a change in land use at the alternate site. The site is currently vacant, part of a larger parcel, also mostly vacant. Construction of the proposed consolidated facility would introduce a new land use to the area, in the form of a half-administrative, half-light industrial compound.

This new land use would not be entirely compatible with its surroundings, as it would be adjacent to the Bellevue Housing development, located immediately to the east and southeast. To the north, across McGuire Avenue, several Air Force residential neighborhoods extend as well. Thus, implementing this alternative would result in the construction of an administrative/light industrial facility with substantial security requirements in an area otherwise characterized mostly by residential uses.

However, the area of Air Force housing closest to the alternate site - Doolittle Park - is scheduled for demolition as part of the housing's privatization. Also, no expansion of the Bellevue neighborhood west of the unused railroad right-of-way (which separates the undeveloped, triangular parcel containing the alternate site from the existing units) is planned under the ongoing privatization process. This would ensure that sufficient undeveloped buffers exist around the proposed facility to minimize any adverse impacts to the livability or desirability

of the existing military housing neighborhoods. Any adverse impacts would remain minor.

The alternate site is well outside any restricted area, including the safety zones associated with the airfields present on Bolling AFB and NSF Anacostia. There is no potential for impacts on land uses outside the Installation because of the strong visual and functional separation created by the Bellevue Housing development and I-295 between the Installation and the residential neighborhoods to the east.

4.1.3.2 Relevant Planning Documents, Initiatives, and Projects

Comprehensive Plan for the National Capital - Federal Elements - Federal Workplace

Like the Anacostia Alternative, and for the same reasons (see Section 4.1.2.2), the Bellevue Alternative would generally be consistent with the relevant policies of the *Federal Workplace Element* of the *Comprehensive Plan for the National Capital*, with, however, the following differences:

4. *Support regional and local agency efforts to coordinate land use with the availability or development of transportation alternatives to the private automobile, including walking, bicycle riding, and public transit [...] when locating Federal workplaces.*

The alternate site is farther removed from available and planned alternative modes of transportation than is the preferred site.

5. *Locate Federal facilities within walking distance of existing or planned fixed guideway transit services [...] Priority should be given to locations within walking distance to Metrorail due to its extensive reach into the region's residential areas.*

The alternate site is not within walking distance from the Anacostia Metrorail Station; it is also far from the nearest existing shuttle stop. These issues are discussed in more detail in Section 4.3.3.1.

8. *Minimize development of open space by selecting disturbed land or brownfields for new Federal workplaces or by reusing existing buildings or sites.*

Unlike the preferred site, the alternate site is currently entirely open. However, the larger parcel within which it is located was once occupied by a residential development

that appears to have been demolished in the mid to late 1990's (see Section 3.6.2). Thus, it is likely that some or all of the site has already been disturbed.

The Bellevue Alternative, like the Anacostia Alternative and for the same reasons, would also support the policies pertaining to the regional distribution of Federal workplaces (see Section 4.1.2.2). Finally, again like the Anacostia Alternative, the Bellevue Alternative would be consistent with locating warehousing, utility, supply, and storage activities within the District of Columbia in places that are easily accessible from the regional highway system and without negative traffic impacts to the local arterial and roadway system facilities (traffic impacts are addressed in Section 4.3.3).

On-going Plans and Projects in the District of Columbia

The proposed action under the Bellevue Alternative would have no effect on the several ongoing plans, initiatives, and projects outlined in Section 3.1.2.1. Relocating NSMA to a consolidated facility at the alternate site would not create conditions that could impede or prevent the completion or success of these projects.

Naval District Washington and Bolling AFB-NSF Anacostia

The Bellevue Alternative is generally consistent with the existing RSIP for NDW facilities. The 2004 *Site Development Plan* included a concept for the development of the triangular parcel within which the alternate site is located that is generally consistent with the proposed action (the concept was for the relocation of the Office of Naval Research from Arlington County). The site is not included in the more recent *NSF Anacostia-Bolling AFB Joint Base Master Plan - Phase 1 - Concept Report*. However, it can be noted that the Concept Report's proposed land use maps designate the area directly across from the site (an area presently occupied by the Doolittle Park residential development) as a Secure Mission use. Building the proposed consolidated NSMA facility on the alternate site would be compatible with this neighboring designation, should it be maintained during Phase 2 of the joint base master planning process.

Under the Bellevue Alternative, the proposed NSMA facility would be built within a parcel that is included in the Bellevue Housing privatization project. Therefore, implementation of this alternative would require removing at least the alternate site

and its immediate surroundings from the privatization project's land lease area and keeping them under direct government control. The alternative would not otherwise affect the privatization project since the parcel within which the alternate site is located is mostly undeveloped and no new construction or development is included in the privatization of Bellevue. Any adverse impacts, therefore, would remain minor.

The Bellevue Alternative would not affect the ongoing redevelopment of the privatized Bolling AFB housing. The neighborhood closest to the alternate site and with the most potential to be affected by the proposed action under this alternative - Doolittle Park - is scheduled for demolition. Other housing areas are sufficiently far from the alternate site not to be affected by the construction there of the proposed NSMA facility (See also Section 4.1.3.1).

4.1.3.3 Design Reviews

The site plan and design of the proposed consolidated facility would be the same under the Bellevue Alternative as under the Anacostia Alternative. Consultation about the design with NCPC and CFA is ongoing, consistent with applicable review requirements for Federal projects in the District of Columbia. Implementation of the proposed action would not begin until all necessary approvals have been obtained.

4.2 Socioeconomics

4.2.1 No Action Alternative

Under the No Action Alternative, NSMA would remain at its current locations in Arlington County, VA. There would be no change to existing socioeconomic conditions and no impacts.

4.2.2 Anacostia Alternative (Preferred)

4.2.2.1 Demographics and Economy

Under the Anacostia Alternative, the workplace of approximately 800 NSMA personnel currently at different locations in Arlington County, VA, would be relocated to a new facility at NSF Anacostia. This would be the only substantial increase in the working population of the Installation for the foreseeable

future. Other on-going relocation and consolidation projects would result in no significant net change.

In the short or medium term, because of the relatively short distance between the current locations of NSMA in Arlington County, VA and NSF Anacostia, it is not expected that the relocation of the agency would result in a significant number of NSMA employees moving their residences. In the long term, with normal personnel turnover, proximity to NSF Anacostia would be a factor to consider for new personnel seeking housing. This would eventually result in a change in NSMA staff's overall residential patterns relative to existing or no action conditions. However, such change would take place slowly and progressively, with negligible impacts at both the local and regional level.

Construction of the proposed combined NSMA facility would have a positive impact on the local economy, as it would generate design and construction jobs and revenues. However, in the context of the Washington DC regional economy, this impact would be small.

4.2.2.2 Environmental Justice and Protection of Children

As explained in Section 3.2.2, NSF Anacostia is located in a part of Washington DC that qualifies as an Environmental Justice community on both racial and economic grounds. Implementation of the proposed action under the Anacostia Alternative, however, is not expected to have disproportionate adverse impacts on this community. As shown elsewhere in this chapter, the alternative would not have any significant impacts that could adversely affect the local community, including impacts on area land use, local traffic, or air quality. More localized impacts, in addition to not being significant, would be contained within NSF Anacostia, a limited-access installation separated from nearby residential neighborhoods by major transportation facilities. These impacts would not be noticeable outside the site or the Installation. Therefore, the Anacostia Alternative does not raise concerns under EO 12898.

Nor does the alternative raise concerns under EO 13045. There are no concentrations of children near the preferred site that could be affected by the proposed action. During construction of the proposed facility, the location of NSF Anacostia and controlled access make it unlikely that neighborhood children or youths could come sufficiently close to the site to put themselves at risk of accident. Similarly, because of distance,

children or youths from the military housing areas located south of NSF Anacostia (Bolling and Bellevue housing) are unlikely to come near the project site. NSF Anacostia's CDC is located near the northern tip of the installation, far from the preferred site. For these reasons, no disproportionate adverse impacts to children are expected.

4.2.3 Bellevue Alternative

4.2.3.1 Demographics and Economy

Under the Bellevue Alternative, as under the Anacostia Alternative and for the same reasons (see Section 4.2.2.1), no demographic impacts are expected. There would be a small positive impact on the regional economy.

4.2.3.2 Environmental Justice and Protection of Children

As under the Anacostia Alternative and for the same reasons (see Section 4.2.2.2), the Bellevue Alternative raises no concern under EO 12898. Nor does it raise significant concerns under EO 13045. Although the alternate site is relatively close to the Bellevue and Bolling residential areas, which are home to many children and youths, it would be secured both during construction and after the completion of the proposed facility, so that children are unlikely to be able to enter it and put themselves at risk. Measures to minimize construction-related impacts, such as wetting or seeding to prevent fugitive dust, would also minimize the potential impacts on children nearby. In general, the distance between the site and the closest residential areas would be sufficient to minimize any risks from either the construction or the operation of the proposed facility. For these reasons, no disproportionate adverse impacts to children are expected.

4.3 Transportation

4.3.1 No Action Alternative

Under the No Action Alternative, NSMA would remain at its current locations in Arlington County, VA and would not relocate to either the preferred or the alternate site. There would be no impacts to transportation systems.

To provide a baseline to evaluate the traffic impacts of the two action alternatives, however, projected LOS for the six study intersections were determined for the year 2011. Based on a review of existing projects (see Section 3.1.2), no significant changes to the area's roadway network or significant new traffic generators will be on line by 2011 (in particular, no significant net change in Bolling AFB and NSF Anacostia personnel is expected). Therefore, no action 2011 conditions were modeled assuming only a background two-percent-per-year growth rate, which was added to the 2009 traffic volumes. The results of the analysis are shown in Table 4-1. The full traffic impact analysis is in Appendix C.

Table 4-1
LOS: No Action (2011)

Intersection		AM Peak Hour			PM Peak Hour			Type
#	Location	v/c Ratio	Delay (secs)	LOS	v/c Ratio	Delay (secs)	LOS	
1	South Capitol St. northbound and Malcolm X Ave.	0.32	25.4	C	0.38	11.2	B	Signalized
2	South Capitol St. southbound and Malcolm X Ave.	0.81	24.0	C	0.81	18.6	B	Signalized
3	I-295 off ramp at Malcolm X Ave. SE	-	17.9	C	-	17.9	C	Un-signalized
4	South Capitol St. at Firth Sterling Ave.	0.58	22.8	C	0.96	37.6	D	Signalized
5	Overlook Ave. SW at South Gate	0.37	15.8	B	0.31	13.5	B	Signalized
6	Overlook Ave. SW at Chesapeake St. SW	0.42	12.6	B	0.41	10.0	A	Signalized

As can be seen by comparing Table 4-1 and Table 3-5, all but one of the study intersections are projected to continue to operate at overall LOS C or better. The exception is intersection #4 (South Capitol Street at Firth Sterling Avenue), which is projected to operate at LOS D during the PM peak hour, as

opposed to C under existing conditions. As previously noted, in a major urban area such as Washington, DC, LOS D is considered acceptable.

4.3.2 Anacostia Alternative (Preferred)

Under the Anacostia Alternative, the proposed combined facility would be built on the preferred site. NSMA's 800 personnel would occupy the facility in 2011. As noted in Section 4.3.1, this is the only significant change in the working population of Bolling AFB and NSF Anacostia that is expected to occur between now and 2011. Similarly, no significant change in the study area's roadway network and no significant new generators of traffic are expected to come on line during that short period.

4.3.2.1 Transit Access

As noted in Section 3.3.1.1, the Anacostia Metrorail Station, near the intersection of Firth Sterling Avenue and Howard Road, SE, is located a little more than half a mile from NSF Anacostia's North Gate. The preferred site is located approximately 1,700 feet from the gate. Thus, NSMA employees using Metrorail would have to walk approximately 4,500 feet between the Metro station and their workplace, a 17-minute walk (assuming a 3-mile-per-hour walking speed). In addition to the distance, the lack of adequate sidewalks and the reputation of the surrounding neighborhood as a high-crime area are likely to discourage Metrorail users.

The Navy has prepared a Transportation Management Plan (TMP) that outlines measures to encourage transit usage among NSMA employees. Such measures include, among others, improved shuttle service between the Metro station and the installation as well as working with DDOT to improve pedestrian infrastructure along Firth Sterling Avenue. At this stage, the number of NSMA employees who would regularly ride Metrorail cannot be estimated. However, it can be expected that any increase in passenger loads at the Anacostia Station would be absorbed into the increase planned for by the Washington Metropolitan Area Transit Authority (WMATA), which is projected to be about 50 percent between 2005 and 2030 for Green Line stations in Southeast Washington.

Barring significant changes in bus routes and schedules, few NSMA employees are expected to ride Metrobus to and from work. As can be seen in Table 3-3, the Metrobus lines that run near

NSF Anacostia originate and end in Maryland. However, 70 percent of NSMA's current employees reside in Virginia and only 29 percent reside in Maryland. Since it is unknown where in Maryland these 29 percent are located, it is not possible to estimate how many may live close enough to one of the existing bus lines to find it an attractive option to ride the bus to and from work, but this number can be expected to be small and unlikely to create capacity problems for Metrobus.

4.3.2.2 Vehicular Access

In the short term, construction of the proposed consolidated NSMA facility would generate some additional traffic, as construction equipment, trucks, and construction workers travel to and from the project site. However, these impacts would be small and temporary and are not expected to be noticeable.

In the long term, relocating approximately 800 NSMA employees to NSF Anacostia would generate additional traffic on nearby roadways. The impacts of the resulting increase in traffic on the study intersections were analyzed by adding the number of vehicle trips that would be generated by the proposed relocation to the projected no action 2011 traffic volumes. The complete traffic impact analysis can be found in Appendix C.

Trip Generation

Estimating the number of vehicle trips generated by NSMA required determining the likely modal split, that is the percentage of employees using different modes of transportation. Data available in the December 2004 *Anacostia Annex Site Development Plan* (Section 3.6) were used to that effect (this approach yields fairly conservative results since it does not take into account the transportation management measures that NSMA would implement to promote the use of alternative commuting methods among its employees and encourage ridesharing; these measures are outlined in the TMP prepared by the Navy for this proposed action).

On this basis, the number of vehicle trips to the site on a typical workday was calculated as shown in Table 4-2.

Table 4-2
Modal Split and Vehicle Trips

Mode of travel	Modal Split ¹	Employees ²	Vehicle trips (one-way)
Driving Alone	73%	584	584
Car pooling	16%	128	51
Van pooling	6%	48	10
Non-vehicular	5%	40	0
Total	100%	800	645

1. Source: *Anacostia Annex Site Development Plan*, December 2004
2. Based on an estimated average of 2.5 passengers in each car pool and 5 passengers in each van pool.

It can be estimated that a total of 645 vehicle trips would be generated by the site every AM and PM. Hourly arrival and departure rates were determined by analyzing gate traffic counts conducted on November 18, 2008. On this basis, 44 percent of the trips (284 vehicles) would arrive during the AM peak hour (7:00-8:00 AM) and 42 percent (271 vehicles) would depart during the PM peak hour (4:15-5:15 PM). The distribution of these trips among the Installation's three gates was calculated using the same November 2008 counts. The number of visitors/deliveries during the AM and PM peak hours was assumed to be 14 vehicles.

Traffic Distribution

The distribution of project-generated vehicular traffic on the roadways providing access to and from the project site is a key element in determining traffic impacts on the surrounding intersections. The following residential location data were provided by NSMA: 70 percent of existing NSMA employees reside in Virginia, 29 percent in Maryland, and 1 percent in another jurisdiction, assumed to be Washington DC for the purposes of this analysis. Generally, distributing vehicle trips over the road network requires finer-grained data (preferably employees' residential zip codes), which were not made available for this study. Therefore, the analysis must rely on reasonable assumptions with regard to the residential distribution of NSMA's employees.

To this end, the residential distribution of DoD employees relocating from Arlington County to Fort Belvoir, VA, as presented in the *Final Environmental Impact Statement for BRAC Implementation and Related Army Actions* (June 2007), was used as a stand-in (with minor adjustments) for the residential distribution of NSMA employees, also DoD employees currently located in Arlington County.

On this basis, it was estimated that 40 percent of the NSMA employees would enter the study area from southbound South Capitol Street, 32 percent would enter it from southbound I-295, 26 percent from northbound I-295, and 2 percent from westbound Suitland Parkway. Sixty two percent of the traffic is expected to use the North Gate; 26 percent the Main Gate; and 12 percent the South Gate. Peak-hour trips calculations are summarized in Table 4-3.

Table 4-3
Peak Hour Trip Generation - Anacostia Alternative

	AM Peak Hour				PM Peak Hour			
	No. of Trips	% Enter/Exit	No. of Trips		No. of Trips	% Enter/Exit	No. of Trips	
			Enter	Exit			Enter	Exit
North Gate	185	78/22	144	41	177	18/82	32	145
Main Gate	77	86/14	66	11	74	16/84	12	62
South Gate	36	85/15	31	5	34	15/85	5	29
Total NSMA	298	81/19	241	57	285	17/83	49	236

2011 LOS Analysis

The study intersections were analyzed to estimate 2011 LOS under the Anacostia Alternative. Existing traffic signal timings were used to allow for direct comparison with the other alternatives (however, future signal timing modifications may improve delays, if needed.) Table 4-4 summarizes the results of the analysis.

LOS under the Anacostia Alternative would be the same as under no action conditions, though with slightly increased delays. All study intersections would operate at overall LOS C or better, with the exception of intersection #4 (South Capitol Street at Firth Sterling Avenue), which would operate at LOS D during the PM peak period, as it would under no action conditions. As previously noted, LOS D is an acceptable LOS in a dense urban area such as Washington, DC.

Thus, based on the LOS analysis, implementation of the proposed action under the Anacostia Alternative is not expected to result in significant adverse traffic impacts. Existing roadways and intersections would continue to operate under capacity. Intersection delays and v/c ratios would increase marginally.

Table 4-4
LOS: Anacostia Alternative (2011)

Intersection		AM Peak Hour			PM Peak Hour			Type
#	Location	v/c Ratio	Delay (secs)	LOS	v/c Ratio	Delay (secs)	LOS	
1	South Capitol St. northbound and Malcolm X Ave.	0.34	27.4	C	0.38	11.2	B	Signalized
2	South Capitol St. southbound and Malcolm X Ave.	0.84	27.9	C	0.86	19.9	B	Signalized
3	I-295 off ramp at Malcolm X Ave. SE	-	20.1	C	-	17.2	C	Un-signalized
4	South Capitol St. at Firth Sterling Ave.	0.70	26.7	C	1.06	44.6	D	Signalized
5	Overlook Ave. SW at South Gate	0.37	15.8	B	0.32	13.4	B	Signalized
6	Overlook Ave. SW at Chesapeake St. SW	0.42	12.5	B	0.41	9.8	A	Signalized

4.3.2.3 Parking

As indicated in Section 3.3.3, there are an estimated 832 general use parking spaces within 0.25 mile of the preferred site. Of these, a recent survey found that from 463 to 501 remain available during the day, or an average of 482.

Of the existing parking spaces, 14 are located on the preferred site and would be lost. However, 46 new spaces would be built as part of the new NSMA facility. It is expected that a portion of the new parking would be reserved for the agency's leadership, handicapped employees, and visitors. Although no specific information on how many spaces would remain open for general use is available at this time, it can reasonably be assumed that there would be enough such spaces to offset the loss of the 14 existing spaces and very few more, if any. Thus, the total number of unrestricted parking spaces within 0.25 mile of the facility would not change significantly.

Because no significant net change in personnel numbers (other than that resulting from the proposed relocation of NSMA) is expected to occur at either NSF Anacostia or Bolling AFB by 2011, it can be assumed that all existing surplus parking within the 0.25-mile radius will remain available for use by NSMA employees. Therefore, the total number of parking spaces available for use by NSMA employees after the relocation would be approximately 482, or a space to employee ratio of 1:1.66 or 0.60. (The ratio may actually be lower because much of the potentially available parking is located in two garages and the upper floor of both garages is not usable by all vehicles because of low ramp clearances; also, some of the potentially available parking may in fact have become unavailable by the time NSMA relocates to the site.)

As shown in Table 4-2, a total of approximately 645 new vehicles can be expected to require parking at NSF Anacostia after the proposed relocation. Therefore, the demand is projected to exceed the supply by approximately 163 spaces.

NSMA would implement measures to reduce parking demand by its employees in order to better match the supply and meet NCPC's parking ratio requirements for Federal facilities in the District of Columbia (outside the central employment area) - 1 space for every 4 employees. Such measures are delineated in the TMP prepared by the Navy for this proposed action. They include efforts to encourage transit usage, ridesharing, telecommuting, and flexible working hours. While these measures can be expected to help make good the projected deficit in parking spaces, however, reaching the applicable NCPC parking ratio would require Installation-wide measures and inter-agency collaboration (e.g., for pedestrian improvements outside the Installation). It is expected that these issues will be further addressed in an Installation-wide TMP being prepared in association with the ongoing joint-base master planning effort briefly described in Section 3.1.2.2 of this EA.

Because of the location of NSF Anacostia, it is not expected that any significant number of NSMA employees would seek parking on public streets. Thus, the proposed action would have no impact on public parking.

4.3.3 Bellevue Alternative

4.3.3.1 Transit Access

Because of the remote location of the alternate site, it is likely that, without special measures, a very small number of NSMA employees, if any, would commute to the new facility by mass transit. At a minimum, measures to make transit use more attractive would have to include extending the route of the existing Air Force shuttle to serve the new facility. Other measures, such as a dedicated shuttle reserved for NSMA employees, on the model of what was done for DIAC, may also have to be considered. In any case, the number of new transit trips that would be generated by the proposed action under this alternative is not expected to be any higher than under the Anacostia Alternative; it would have no significant adverse impact on existing transit infrastructure or service.

4.3.3.2 Vehicular Access

The short-term, construction-related traffic impacts of the Bellevue Alternative would be the same as those of the Anacostia Alternative and, for the same reasons, would not be significant.

To evaluate the potential long-term traffic effects of the Bellevue Alternative, a similar mode split and trip generation to those used for the Anacostia Alternative were assumed. However, because of the location of the alternate site, different traffic distribution assumptions were developed. It was estimated that under this alternative, 86 percent of the relocated NSMA employees would enter the study area from northbound I-295, 9 percent would enter from southbound I-295, and 5 percent would enter from South Capitol Street. Seventy-five percent of this traffic would use the South Gate; 20 percent the Main Gate; and 5 percent the North Gate. Projected peak hour traffic is shown in Table 4-5. Projected 2011 LOS are presented in Table 4-6.

LOS under the Bellevue Alternative would be the same as under no action conditions, though with slightly increased delays. All study intersections would operate at overall LOS C or better, with the exception of intersection #4 (South Capitol Street at Firth Sterling Avenue), which would operate at LOS D during the PM peak period, as it would under no action conditions. As previously noted, LOS D is an acceptable LOS in a dense urban area such as Washington, DC.

Table 4-5
Peak Hour Trip Generation - Bellevue Alternative

	AM Peak Hour				PM Peak Hour			
	No. of Trips	% Enter/Exit	No. of Trips		No. of Trips	% Enter/Exit	No. of Trips	
			Enter	Exit			Enter	Exit
North Gate	14	78/22	11	3	14	18/82	3	11
Main Gate	60	86/14	52	8	57	16/84	9	48
South Gate	224	85/15	178	46	214	15/85	37	177
Total NSMA	298	81/19	241	57	285	17/83	49	236

Table 4-6
LOS: Bellevue Alternative (2011)

Intersection		AM Peak Hour			PM Peak Hour			Type
#	Location	v/c Ratio	Delay (secs)	LOS	v/c Ratio	Delay (secs)	LOS	
1	South Capitol St. northbound and Malcolm X Ave.	0.33	27.1	C	0.38	11.2	B	Signalized
2	South Capitol St. southbound and Malcolm X Ave.	0.84	26.3	C	0.84	19.3	B	Signalized
3	I-295 off ramp at Malcolm X Ave. SE	-	19.1	C	-	17.3	C	Un-signalized
4	South Capitol St. at Firth Sterling Ave.	0.59	23.0	C	0.97	38.0	D	Signalized
5	Overlook Ave. SW at South Gate	0.43	16.8	B	0.39	13.0	B	Signalized
6	Overlook Ave. SW at Chesapeake St. SW	0.53	12.7	B	0.52	9.9	A	Signalized

Therefore, the Bellevue Alternative would have no significant adverse effects on traffic conditions. Existing roadways and intersections would continue to operate under capacity. Intersection delays and v/c ratios would increase marginally.

4.3.3.3 Parking

Under the Bellevue Alternative, because of the remote location of the project site and the lack of existing surplus parking within walking distance, the projected parking shortage would be greater than under the Anacostia Alternative. Implementing appropriate transportation management measures would reduce parking demand. These measures could be supplemented by other measures to make surplus parking far from the site usable, for instance by providing shuttle service between the more remote parking lots or garages and the new facility. Even with such measures, it is not certain that NSMA could operate at the alternate site without constructing new, nearby parking for its employees. Should the Navy select the Bellevue Alternative for implementation, therefore, additional studies would be required to address the potential parking deficit. As under the Anacostia Alternative, however, it is not expected that any significant number of NSMA employees would seek parking on public streets. Thus, there would be no impact on public parking.

4.4 Air Quality

4.4.1 No Action Alternative

Under the No Action Alternative, existing conditions would continue. This would have no impact on air quality.

4.4.2 Anacostia Alternative (Preferred)

Two factors associated with the proposed relocation of NSMA have the potential to result in air quality impacts: the resulting additional traffic on local roads and the construction and operation of the new facility.

4.4.2.1 Traffic-related Impacts

The primary automobile-related air pollutants are CO, PM (PM₁₀ and PM_{2.5}), and the precursors of O₃, NO_x and VOCs. Project-level air quality impacts from traffic are generally evaluated on two scales:

- Microscale level for CO and PM: A microscale analysis (also referred to as a hot-spot analysis) of traffic-related impacts at intersections or free-flow sites provides

estimates of localized concentrations for direct comparison to the NAAQS and/or other applicable impact thresholds.

- Mesoscale level for NO_x and VOCs: NO_x and VOCs, precursors of O₃, are usually of regional concern in nonattainment areas. Potential emission increases from additional vehicle miles traveled (VMT) may affect regional O₃ levels. Since O₃ is a problem of regional concern and subject to air transport phenomena under different weather conditions, O₃-related impacts are generally evaluated on a regional basis by the appropriate regional Metropolitan Planning Organization (MPO; in the case of the District of Columbia, the Metropolitan Washington Council of Governments [MWCOG]), using regional O₃ airshed models. This type of mesoscale analysis is generally not conducted on a project-by-project basis and is not necessary for this EA.

CO Impacts

Future CO concentrations were modeled based on the traffic impact analysis summarized in Section 4.3.2.2. The study intersection with the highest projected traffic volume was selected for the analysis. This intersection is study intersection #4, South Capitol Street and Firth Sterling Avenue (worst-case intersection).

The modeling was performed in two steps:

- Vehicle exhaust emission factors were estimated using the USEPA Mobile6.2 emission factor model with input parameters that are applicable to the Washington, DC area as provided by the MWCOG Air Quality Division.
- The estimated emission factors were subsequently used as input for the USEPA CAL3QHC dispersion model to calculate CO concentrations at the worst-case intersection with worst-case meteorological conditions.

A more detailed description of the modeling procedures is presented in Appendix B.

The results of the analysis are presented in Table 4-7. The expected concentrations are well below both the 1-hour and the 8-hour CO NAAQS. Therefore, the Anacostia Alternative is not expected to result in significant impacts with respect to CO emissions.

Table 4-7
Modeled Worst-case CO Levels

Intersection	One-Hour Concentration (ppm)	Eight-Hour Concentration (ppm)
South Capitol Street and Firth Sterling Avenue	3.9	3.2
Notes: CO levels include background concentrations of 3.0 ppm (1-hour) and 2.6 ppm (8-hour). NAAQS CO one-hour standard is 35 ppm; the eight-hour standard is 9 ppm.		

PM Impacts

Potential traffic-related PM ($PM_{2.5}$ and PM_{10}) impacts were evaluated consistent with the available guidelines and qualitative hot-spot analysis procedures established by the USEPA (March 2006).

While the proposed action would involve an increase in traffic volumes near the Installation, this increase would almost exclusively consist of personal vehicles commuting to and from the proposed new facility. While some new truck traffic would be associated with the proposed action, it would be negligible compared to commuting traffic. Thus, the proposed action is not one of the projects listed in the USEPA's guidelines that require further qualitative $PM_{2.5}$ and PM_{10} hot-spot analysis.

Therefore, it can be concluded that the proposed action would not cause or contribute to a violation of the PM NAAQS; nor would it increase the frequency of an existing exceedance of the $PM_{2.5}$ NAAQS. The Anacostia Alternative would not have significant PM impacts.

4.4.2.2 Construction-related Impacts

Construction of the proposed consolidated NSMA facility would cause short-term, minor air quality impacts. The principal air quality concern associated with construction activities is the emission of fugitive dust. Mobile emission sources, such as construction vehicles and equipment as well as private passenger vehicles used to access the work area, would also contribute to construction-phase air pollution.

However, construction-related effects are by definition temporary and can be effectively minimized by using standard best management practices (BMPs). For instance, water

applications and periodic sweeping can aid in preventing dust from becoming airborne. Thus, short-term air quality impacts from the proposed construction activities are not expected to be significant.

4.4.2.3 Stationary Source Operational Impacts

The only long-term stationary source of new emissions would be the heating boiler(s) for the proposed new facility. At this stage, no sufficient information is available to allow for a quantitative estimate of the emissions that would result from the operation of the new facility. When the project reaches a design stage that allows for such an estimate, the Navy will update NSF Anacostia's Title V permit as required. Based on the size and function of the facility, emissions are not expected to cause a significant increase in NSF Anacostia's total air emissions.

4.4.2.4 Clean Air Act Conformity

Because the proposed action would take place in a non-attainment area for O₃ and PM_{2.5}, a General Conformity Rule (GCR) analysis was conducted according to the guidance provided in the final rule for *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (USEPA, November 30, 1993). Under the GCR, reasonably foreseeable emissions associated with all operational and construction activities, both direct and indirect, must be quantified and compared to the annual *de minimis* levels applicable to the pollutants for which the project area is in nonattainment or is a maintenance area. For an O₃ moderate nonattainment area in a transport region and PM_{2.5} nonattainment area, such as Washington, DC, the *de minimis* levels are: 100 tons per year (tpy) (91 metric tpy) for NO_x, PM_{2.5} and SO₂ (SO₂ is a precursor of PM_{2.5}); and 50 tpy (46 metric tpy) for VOCs. Estimated annual NO_x, VOC, PM_{2.5}, and SO₂ emissions from the construction and operation of the proposed NSMA facility are presented in Table 4-8. The methodologies used to develop these estimates are detailed in Appendix B.

Under the GCR, if the expected total direct and indirect annual emissions of a criteria pollutant (or its precursors) for which the project area is in nonattainment or maintenance do not exceed the applicable *de minimis*, the Federal action has minimal air quality impact and is determined to conform for the pollutant in question; no further analysis is necessary. Conversely, if the emissions are projected to be above the *de minimis*, a formal general conformity determination is required

for that pollutant. As shown in Table 4-8, the expected increases in the annual emissions of relevant criteria pollutants would not exceed the applicable *de minimis* levels. Therefore, a formal conformity determination is not required for the proposed action under the Anacostia Alternative. Additionally, the increase in annual emissions is not projected to exceed 10 percent of the Washington DC regional emissions inventory; therefore, the Anacostia Alternative would not result in significant regional air quality impacts.

A Record of Non-Applicability is included in Appendix B.

Table 4-8
Estimated Total Annual Emissions

Emission Source	Pollutant (tons/year)			
	VOC	NO _x	PM _{2.5}	SO ₂
Construction Year				
Construction Equipment	0.55	3.57	0.22	0.08
Motor Vehicles	0.14	0.77	0.02	0.00
Paving	0.02	-	-	-
Total Construction Annual Emissions	0.71	4.34	0.24	0.08
Operational Year ¹				
Motor Vehicles	0.001	0.002	0.000	0.000
<i>De Minimis Level</i>	50	100	100	100
<i>10% 2009 Regional Emission Inventory²</i>	12,702	13,213	2,336	23,190
1. Emissions from the proposed facility's boiler(s) are not included (see Section 4.4.2.3); however, based on the size of the building and the estimated 2008 total emissions presented in Table 3-8, they are not likely to result in an exceedance of the <i>de minimis</i> . 2. MWCOG PM _{2.5} State Implementation Plan, March 7, 2008.				

4.4.3 Bellevue Alternative

Under this alternative, all emission sources and emissions resulting from the proposed relocation of NSMA would be the same as or similar to those under the Anacostia Alternative. Therefore, impacts on air quality would be the same and would

not be significant for the reasons explained in Section 4.4.2. As under the Anacostia Alternative, a formal general conformity determination would not be required.

4.5 Noise

4.5.1 No Action Alternative

Under the No Action Alternative, there would be no changes to existing noise levels at the Installation and no impacts.

4.5.2 Anacostia Alternative (Preferred)

The increase in local traffic that would result from the proposed relocation of NSMA to NSF Anacostia and the operation of equipment and vehicles during the construction of the proposed consolidated facility would result in noise impacts. These impacts would not be significant. Operation of the proposed new facility is not expected to significantly affect ambient noise levels in the long term.

4.5.2.1 Traffic-related Impacts

Traffic on nearby South Capitol Street and I-295 is a dominant source of noise on the Installation and in surrounding areas. In areas where traffic is the dominant noise source, noise impacts from traffic increases can be evaluated based on the size of the increase using general acoustical principles. For example, if the existing traffic volume on a street is 100 vehicles per hour (vph) and the future volume is projected to be 150 vph, a 50 percent increase, ambient noise levels would increase by approximately 2 dBA. If traffic were to double, from 100 vph to 200 vph, noise levels would increase by 3 dBA. According to Federal Highway Administration (FHWA) guidelines, a change in noise of 3 dBA is considered a barely perceptible change.

Based on the traffic impact analysis summarized in Section 4.3.2, while the proposed relocation of NSMA to NSF Anacostia would result in an increase in traffic on I-295 and South Capitol Street, this increase would be far from what would be required to add 3 dBA to existing noise levels. Therefore, the traffic-related noise impacts of the proposed action would be minimal and not significant.

4.5.2.2 Construction-related Impacts

Noise would result from the construction of the proposed NSMA facility, including noise from construction equipment, trucks, and personnel vehicles commuting to and from the project site. However, these noise impacts would not be significant because (1) they would be temporary and vary substantially with the construction phase: in general they would be highest in the early stages of construction and decline thereafter (2) they would be mostly limited to weekday working hours, when general ambient noise is highest (3) they would be localized and unlikely to be perceptible from outside the immediate vicinity of the project site. No sensitive noise receptors are located nearby: the closest such receptor is the NSF Anacostia CDC near the northern tip of NSF Anacostia, well away from the site, and (4) they would be typical of a mid-size construction project similar to numerous projects under way every day in the District of Columbia.

4.5.3 Bellevue Alternative

Noise impacts under the Bellevue Alternative would be the same as under the Anacostia Alternative. For the same reasons as explained in Section 4.5.2, they would not be significant.

4.6 Cultural Resources

4.6.1 No Action Alternative

Implementation of the No Action Alternative would not have any effects on known or potential cultural resources.

4.6.2 Anacostia Alternative (Preferred)

As explained in Section 3.6.1, the preferred site, where the proposed NSMA facility would be built under this alternative, has previously been disturbed and has little potential to contain unknown archaeological resources. Additionally, the site is not located within or adjacent to the Bolling Field Historic District or any other known National Register-listed or eligible architectural resource. The site is sufficiently remote from Buildings 168 and 169 and from the Bolling Field Historic District to make the potential for indirect, visual impacts

minimal. Therefore, implementation of the Anacostia Alternative is not expected to have any adverse effects on cultural resources. The DCHPO concurred with this finding of no effect by letter dated September 30, 2009 (copy in Appendix D).

However, if during construction, archaeological artifacts or skeletal remains were uncovered, work would stop immediately. The Navy would consult with the DCHPO and other parties, as appropriate, before resuming any activities that could disturb the find.

4.6.3 Bellevue Alternative

Construction of the proposed NSMA facility under the Bellevue Alternative would likely disturb Site 51SW7, a prehistoric archaeological site that was found to be potentially eligible for listing in the National Register during a survey conducted in 1994 (see Section 3.6.2). Consistent with the 1994 report's recommendations and in compliance with Section 106 of the National Historic Preservation Act, should the Navy choose to implement this alternative, it would conduct a Phase II evaluation of Site 51SW7 to determine its National Register eligibility prior to beginning any ground-disturbing activities. Following completion of the Phase II survey and its review and approval by the DCHPO, potential adverse effects to the site from the proposed action would be evaluated and, if appropriate, a memorandum of agreement (MOA) would be drawn to define measures that would ensure that any adverse effects to the site are mitigated and not significant. Implementation of the proposed action would not begin until the MOA is signed by all appropriate parties and the Section 106 consultation process is complete.

The alternate site is not located within or adjacent to the Bolling Field Historic District. It is sufficiently remote from the district to make the potential for indirect, visual impacts minimal.

4.7 Natural Resources

4.7.1 No Action Alternative

Under the No Action Alternative, NSMA would not relocate from its current locations in Arlington County, VA to a new,

consolidated facility. There would be no new construction and no impacts to natural resources.

4.7.2 Anacostia Alternative (Preferred)

4.7.2.1 Geology, Topography, and Soils

Construction of the proposed NSMA consolidated facility would not require the kind of deep excavation or blasting that could affect the project site's geological substrate. Nor would the proposed construction affect the topography of the site, which is mostly level. No significant topographic features would be either created or destroyed.

Construction of the proposed new facility would disturb the project site's soils over an area of approximately three acres. As indicated in Section 3.7.1.2, these soils are mapped as Urban Land by NRCS, reflecting previous disturbance. Throughout, the top layer consists of fill of indeterminate origin and various depths. Thus, no natural or pristine surface soils would be disturbed. The primary soil-related concern associated with construction activities is increased erosion, as exposed soil particles are carried off by wind or water. The flatness of the project site would contribute to minimizing construction-related erosion. Additionally, standard BMPs, such as silt barriers or the seeding of exposed soils, would be used to further limit the risk of erosion.

Land disturbing activities affecting more than 50 square feet in the District of Columbia require the preparation of an erosion and sediment control plan to be reviewed and approved by the DC Department of the Environment, Watershed Protection Division. Preparation and implementation of an approved erosion and sediment control plan in compliance with this requirement would ensure that erosion-related impacts are minimal and not significant.

4.7.2.2 Water Resources

Implementation of the Anacostia Alternative would have no direct impact on surface water resources, as no body of water is present on, or adjacent to, the preferred site. The site does not contain wetlands; nor is it located within the 100-year floodplain. In the long term, construction of the proposed facility would increase the amount of impervious surface on the site, which is currently partly pervious. However, as explained

in Section 2.1, the design of the facility would include elements consistent with the Navy's policy to incorporate LID features to construction projects with the goal of generating no net increase in stormwater volume and in sediment and nutrient loadings. These elements would be incorporated into the stormwater management plan required by the District of Columbia for projects disturbing more than 5,000 square feet. As a result of these measures, it is expected that impacts on both the quantity and the quality of the stormwater runoff generated by the project site would be minimal and not significant. Consequently, no significant adverse impacts to water quality in the Anacostia River or the Potomac River - into which stormwater from the Installation discharges - are expected.

In the short term, construction-related erosion could result in a temporary deterioration of stormwater runoff. However, the measures taken to minimize erosion (see Section 4.7.2.1) would also minimize any impacts on runoff and surface water. Any remaining impacts would cease with construction and would not be significant.

4.7.2.3 Biological Resources

Impacts to biological resources would be negligible. Implementation of the Anacostia Alternative likely would result in the loss of the few trees currently present in the unimproved portions of the site. However, reasonable efforts would be made to preserve the more mature trees and reuse them as part of the facility's landscaping, if possible. Any loss would be partly or fully made up by new plantings consisting of native plants, shrubs, and trees.

To the extent that the existing trees and open, grassed areas at the preferred site provide habitat for animal species, this habitat would be lost. However, as noted in Section 3.7.3.2, any existing habitat on the site is of marginal value at best and likely to accommodate only the most common and adaptable urban species. The loss would be in part offset by the facility's landscaping, which would provide some new habitat of similar quality to the existing one and usable by the same species.

As explained in Section 3.7.3.4, no threatened or endangered species are known to occur on the Installation and the impacted character of the preferred site makes it unlikely that it could harbor any rare or fragile species. As noted in Section 4.7.2.2, the alternative would not have any significant adverse effect on water quality in the Potomac River or the Anacostia River; nor,

therefore, could it affect the shortnose sturgeon, a listed species that may be present in these rivers. Thus, implementation of the Anacostia Alternative is not expected to result in any adverse effect to species protected under the ESA.

The Anacostia Alternative is not likely to result in any noticeable adverse impacts to migratory birds protected under the Migratory Bird Treaty Act of 1918. The primary feature of the Installation that can attract species of migratory bird - the shoreline of the Potomac and Anacostia rivers - would not be affected at all.

4.7.3 Bellevue Alternative

4.7.3.1 Geology, Topography, and Soils

The impacts of the proposed action under the Bellevue Alternative would be similar to those of the Anacostia Alternative (see Section 4.7.2.1) and would not be significant. The geological substrate of the area would not be affected. The alternate site is generally level and no significant topographic features would be either removed or created. About three acres of Galestown-Urban Land Complex soil would be disturbed. Standard BMPs would be used to minimize the risk of increased erosion. As under the Anacostia Alternative, an erosion and sediment control plan would be required, to be reviewed and approved by the DC Department of the Environment, Watershed Protection Division. Implementation of the plan would ensure any impacts are minimal.

4.7.3.2 Water Resources

Implementation of the Bellevue Alternative would have no direct impact on surface water resources, as no body of water is present on, or adjacent to, the alternate site. The site does not contain wetlands, nor is it located within the 100-year floodplain. In the long term, construction of the proposed facility would increase the amount of impervious surface on the site, which is currently entirely pervious. However, as explained in Section 4.7.2.2, the incorporation of LID features in the facility's design would ensure impacts pertaining to stormwater runoff are minimal. A stormwater management plan would be prepared, as required by the District of Columbia for projects disturbing more than 5,000 square feet. Because impacts on the quantity and quality of runoff would be minimal, no significant adverse impacts to water quality in the Potomac

River - into which stormwater from the alternate site discharges - are expected.

In the short term, as under the Anacostia Alternative, construction-related erosion could result in a temporary deterioration of stormwater runoff. However, the measures taken to minimize erosion would also minimize any impacts on runoff. Remaining impacts, which would cease with construction, would not be significant.

4.7.3.3 Biological Resources

The impacts of the Bellevue Alternative on biological resources would be negligible. Construction of the proposed new NSMA facility on the alternate site would result in the loss of the vegetation existing on the site. This vegetation consists of grass and a few trees. If possible, existing trees of sufficient maturity would be preserved and incorporated in the facility's landscaping. Any loss would be partially made up by new plantings consisting of native plants, shrubs, or trees.

As is the case for the preferred site, any wildlife habitat at the alternate site is marginal in quality and likely to be used only by the most common and adaptable urban species. The loss of this habitat would be a negligible impact. No species protected under the ESA are known to occur on the Installation and no effects to protected species are expected. Because the alternative would have no effect on water quality in the Potomac River, it has no potential to affect the shortnose sturgeon, a listed species that may occur in the Potomac. For the same reasons as the Anacostia Alternative, the Bellevue Alternative is not expected to affect migratory birds.

4.8 Hazardous Materials and Waste

4.8.1 No Action Alternative

Implementation of the No Action Alternative would have no effect pertaining to hazardous materials or waste.

4.8.2 Anacostia Alternative (Preferred)

NSMA operations at its proposed new consolidated facility would likely require the storage and use of hazardous materials and

result in the generation, storage, and disposal of hazardous waste. In addition to standard products used for building maintenance and routine operations (e.g., paints, solvents), simunition would occasionally and temporarily be stored in the proposed warehouse. Simunition is non-lethal practice small arm ammunition, similar to paintballs but usable with most conventional weapons. It allows for more realistic and effective training. The type of simunition that would be stored at the site consists of paint and wax rounds classified as 1.4S. Division 1.4 explosives are explosives that present a minor explosion hazard; any explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected; an external fire would not cause instantaneous explosion of the package. Compatibility group S refers to substances or articles so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package. No more than 10 pounds of simunition would be present at the site at any one time. Temporary storage and transport of small quantities of this low-risk material is not expected to result in any significant impacts on or off the site. Simunition and all hazardous materials and waste would be handled in accordance with applicable Navy guidelines and requirements, and local and Federal laws and regulations. Proper storage, handling, and disposal of hazardous materials and waste would ensure that the proposed relocation results in no adverse impacts to the environment.

The preferred site does not contain nor is it adjacent to any ER sites. Thus, the Anacostia Alternative has no potential to affect any ongoing cleanup effort. However, as explained in Section 3.8.2, recent subsurface investigations have found that petroleum-impacted soils may be present on the site. Prior to the beginning of any soil disturbing activities, the Navy would review this finding and conduct additional investigations, as needed. If the presence of contaminated soils is confirmed, appropriate measures would be taken to remove and dispose of these soils in accordance with applicable regulations. By providing the opportunity to clean up contaminated soils if any are present, the proposed action has the potential to result in a positive impact.

4.8.3 Bellevue Alternative

Impacts would be the same as those described in Section 4.8.2 for the Anacostia Alternative, except with respect to soil contamination. No subsurface investigations have been conducted at the alternate site, and no information pertaining to potential soil contamination is available. However, should the Navy select this site for constructing the proposed NSMA facility, due diligence would be made to ascertain the presence of any contaminants in the soil above applicable regulatory thresholds. Any contaminated soils would be removed and disposed of in accordance with applicable laws and regulations.

4.9 Cumulative Impacts

Cumulative impacts are "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

As explained elsewhere in this chapter, the proposed action under either action alternative would have no or negligible adverse impacts on the following resources: land use, socioeconomics, cultural resources, topography and soils, water resources, biological resources, and hazardous materials and waste. Therefore, the proposed action would not generate any significant cumulative impacts in these areas.

The proposed action would generate small adverse impacts to vehicular traffic in the area near the Installation by 2011, along with associated noise and air quality impacts. Other projects currently being planned in the area are expected to affect transportation, air quality, and noise conditions as well, though in a much more substantial way. These projects include the South Capitol Street corridor improvements, the redevelopment of Poplar Point, the redevelopment of St. Elizabeth's West Campus, the replacement of the 11th Street bridges, and the redevelopment of Barry Farm.

All these projects together will generate cumulative traffic impacts along with associated noise and air quality impacts. For this reason, transportation planning is an on-going concern in the affected part of the District of Columbia. Multiple roadway and transit improvements are being planned that will address the expected increase in local traffic and employment. For those

projects with Federal involvement, NEPA documentation has been or will be prepared to evaluate potential impacts and define appropriate mitigation measures, including policies that encourage transit usage and ridesharing, and reduce noise and air emission levels. In particular, environmental impacts statements (EIS) have been completed for the South Capitol Street improvements, the consolidation of DHS to St. Elizabeth's, and the replacement of the 11th Street bridges; an EIS is under way for the redevelopment of Poplar Point.

Continuation of these planning efforts and the Navy's participation in them for its undertakings at the Bolling-Anacostia Installation (for instance, NEPA documentation will be prepared as part of the ongoing joint base master plan effort) will ensure that cumulative impacts are properly minimized and mitigated.

4.10 Conclusion

Based on the above analyses, the proposed relocation of NSMA under either the Anacostia Alternative (preferred) or the Bellevue Alternative would not result in significant adverse impacts on the human environment. Preparation of an EIS is not required.

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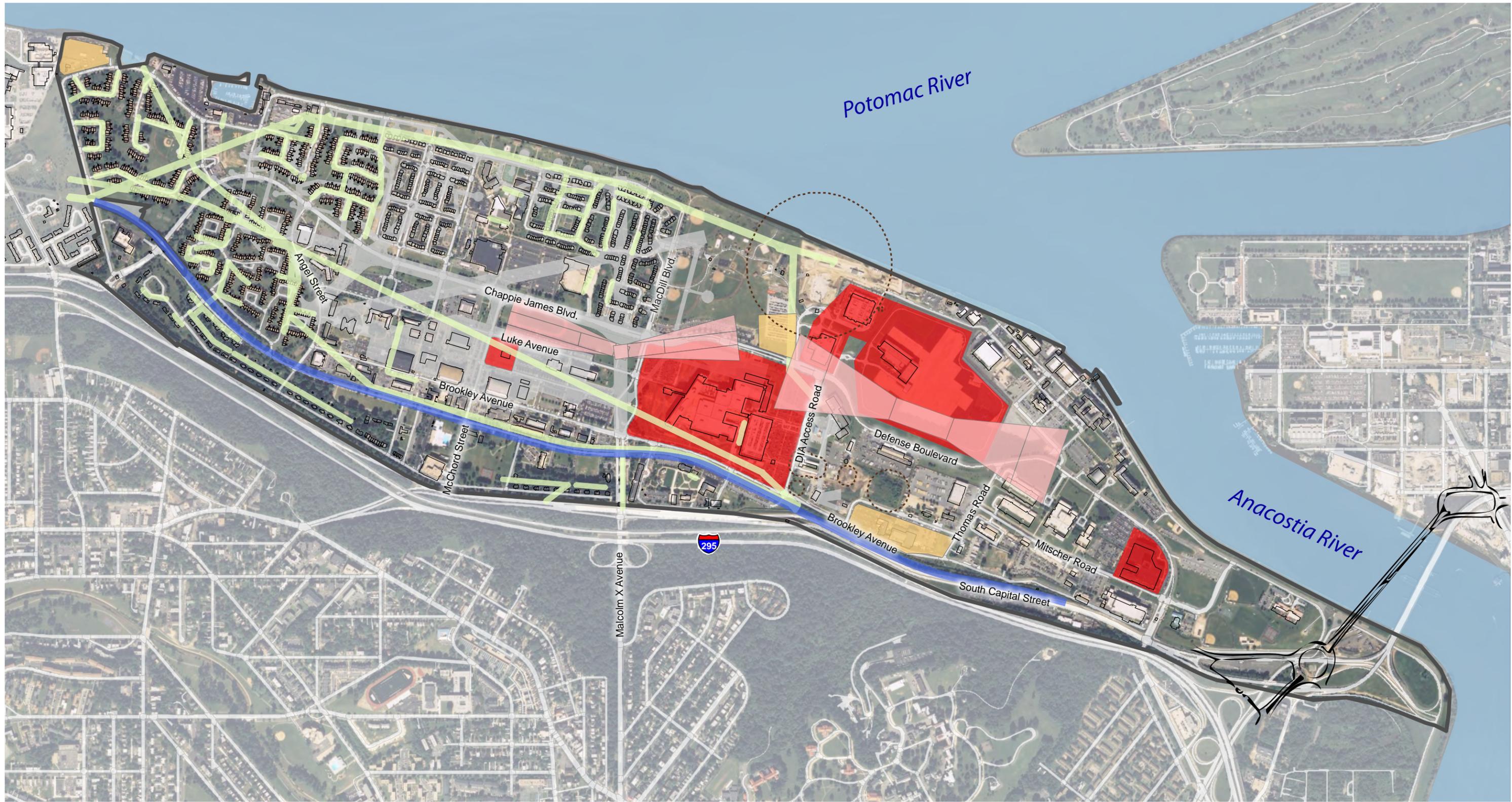
APPENDIX A

Operational Constraints Map

source:

**NSF Anacostia-Bolling AFB Joint Base Master Plan Phase 1 Concept
Report
2008**

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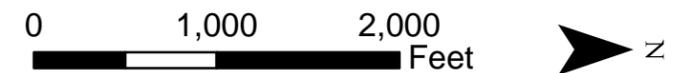


OPERATIONAL CONSTRAINTS

- Airfield Criteria Zones
 - Wastewater Main Line Buffer
 - Road Area
 - Explosive Qty Distance Arc Area
 - Restricted Access Area
 - Outgrant Area
 - Legacy Airfield Surface
- Railroad Easement
 - Frederick Douglass/South Capital Street Bridge Project

PHASE 1, ANACOSTIA-BOLLING JOINT BASE MASTER PLAN

Map A.3



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APPENDIX B

**Air Quality Impact Analyses
And
Record of Non-Applicability**

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B.1 Introduction

This appendix details the following analyses conducted to assess the air quality impacts of the proposed action evaluated in the EA:

- Mobile source CO impact modeling.
 - Mobile source PM impact evaluation.
 - General Conformity Applicability Analysis.
-

B.2 Mobile Source CO Impact Modeling Analysis

This section describes the methods used for the microscale (hot spot) ambient CO dispersion modeling analysis. The analysis includes estimates of emission factors and prediction of CO concentrations at the worst-case intersection. The results of the analysis are in the form of ambient concentration levels for averaging periods corresponding to the CO NAAQS. The CO impact analysis was conducted based on the results of the traffic analysis for the Anacostia Alternative (preferred Alternative) described in the EA.

B.2.1 Modeled Intersection Location

CO impacts were estimated for a weekday AM and PM peak hour at the following intersection:

- South Capitol Street and Firth Sterling Avenue (study intersection #4).

This intersection was selected for CO modeling based on its potential for being subject to the maximum increase in traffic and traffic congestion, with the highest projected traffic volumes. The resulting estimates are, therefore, conservative.

Based on USEPA guidance, reasonable receptor locations include sidewalks, residences, schools, hospitals, parking or vacant lots, and other places continuously accessible to the public. Since sidewalks are generally critical for CO impact analysis, a total of 27 receptors were posited along the roadways of the modeled intersection three meters from the roadway edge. CO concentrations were modeled at these receptors.

B.2.2 Mathematical Models

The projected CO concentrations were determined in two steps: (1) vehicle exhaust emission factors were estimated using the Mobile 6.2 emission factor model with Washington DC-specific input parameters provided by the Metropolitan Washington Council of Governments (MWCOG) Air Quality Division and (2) these emission factors were subsequently used as input for the microscale dispersion model CAL3QHC to calculate CO concentrations at representative intersections. A brief description of the two computer models follows:

- MOBILE6.2 calculates emission factors for 28 individual vehicle types in low and high-altitude regions of the United States. MOBILE6 emission factor estimates depend on various conditions, such as ambient temperatures, travel speeds, operating modes, fuel volatility, and mileage accrual rates.
- CAL3QHC (Version 2) predicts CO concentrations from motor vehicles traveling near roadway intersections. The model incorporates inputs such as roadway geometries, receptor locations, meteorological conditions including wind speed, stability, etc., and vehicular emission factors predicted by MOBILE 6.

Total ambient CO concentrations near an intersection consist of two components - local source contributions (i.e., vehicular emissions near the intersection) and background contributions from other mobile, stationary, and natural sources in the project vicinity. Background CO levels were obtained from the most recent available ambient air measurements collected at the monitoring site closest to the project area; specifically, the air quality monitoring station located at 34th Street and Dix Street in Washington DC. These levels are 3.0 ppm for a one-hour and 2.6 ppm for an eight-hour averaging period. A USEPA default persistence factor of 0.70 was used to convert the one-hour CO concentrations calculated by CAL3QHC to eight-hour concentrations. The persistence factor represents a combination of the hourly variability of traffic and meteorological conditions.

Worst-case meteorological conditions that result in the potentially highest one-hour CO concentration levels were used in the CAL3QHC dispersion modeling.

B.2.3 Analysis Results

The predicted worst-case CO concentrations for the selected intersection are shown in Table B-1. The predicted levels are well below the one-hour and eight-hour CO NAAQS.

Table B-1
Modeled CO Levels - 2011 - Proposed Action

Intersection	One-Hour Concentration (ppm)	Eight-Hour Concentration (ppm)
S. Capitol Street and Firth Sterling Avenue	3.9	3.2
Note: CO levels include background concentrations of 3.0 ppm (1-hour) and 2.6 ppm (8-hour). NAAQS CO one-hour standard is 35 ppm; the eight-hour standard is 9 ppm.		

B.3 Mobile Source PM Impact Evaluation

Since the project is in a nonattainment area for the PM_{2.5} NAAQS, potential traffic-related PM (PM_{2.5} and PM₁₀) impacts were evaluated based on the available guidelines and procedures outlined by the USEPA in:

- Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas (USEPA, March 2006).

Future traffic conditions were evaluated based on the traffic forecasts used for the CO impact analysis. Based on this evaluation, a determination was made as to whether the proposed action is a project with a PM concern that requires a hot-spot analysis. The guideline identifies five categories of project actions with potential air quality concerns that require a qualitative PM_{2.5} and PM₁₀ hot-spot analysis. These are identified at 40 CFR 93.123[b][1](i) through (v) as follows:

- (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 Level-of-Service (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 related to the project.

- (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.
- (v) Projects in or affecting locations, areas, or categories of sites that are identified in the PM_{2.5} and PM₁₀ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Although the proposed action would involve a potential increase in traffic volumes, the additional trips would be mostly from passenger vehicles commuting to and from the project site rather than diesel trucks. Therefore, the proposed action does not fall into any of above project categories that could have potential PM air quality impacts and require further hot spot analysis.

B.4 General Conformity Applicability Analysis

The 1990 amendments to the CAA require Federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP) in a nonattainment area. A SIP is a plan that provides for the implementation, maintenance, and enforcement of the NAAQS. A SIP includes emission limitations and control measures to attain and maintain the NAAQS. Conformity to a SIP, as defined in the CAA, means conformity to a SIP's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of the standards. The Federal agency responsible for an action is required to determine if its action conforms to the applicable SIP.

The USEPA has developed two sets of conformity regulations. Federal actions are differentiated into transportation projects and non-transportation-related projects:

- Transportation projects are governed by the "transportation conformity" regulations (40 CFR Parts 51 and 93), effective on December 27, 1993 and revised on August 15, 1997.

- Non-transportation projects are governed by the "general conformity" regulations (40 CFR Parts 6, 51 and 93) described in the final rule for *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* published in the *Federal Register* on November 30, 1993, effective January 31, 1994, and not updated since.

Since the proposed action is a non-transportation project, only the general conformity rule (GCR) applies.

B.4.1 Attainment and Nonattainment

The general conformity rule applies to Federal actions occurring in a nonattainment or maintenance area for the NAAQS. Federal actions occurring in areas that are in attainment with the NAAQS are not subject to the conformity rule.

Under the requirements of the 1970 Clean Air Act (CAA), as amended in 1977 and 1990, the USEPA established NAAQS for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), inhalable particulate matter (PM₁₀ and PM_{2.5}), and lead (Pb).

Areas that meet the NAAQS for a criteria pollutant are in "attainment;" areas where the criteria pollutant level exceeds the NAAQS are in "nonattainment." O₃ nonattainment areas are subcategorized based on the severity of their pollution problem (marginal, moderate, serious, severe, or extreme). Particulate Matter (PM) and CO nonattainment areas are classified into two categories (moderate or serious). When insufficient data exist to determine an area's attainment status, it is designated unclassifiable (or attainment).

The proposed action would occur at Naval Support Facility (NSF) Anacostia in Washington, DC, an area currently in nonattainment for PM_{2.5}, moderate nonattainment for 8-hour O₃, and attainment for the other criteria pollutants. O₃ is principally formed from precursors nitrogen oxides (NO_x) and volatile organic compounds (VOCs) through chemical reactions in the atmosphere. Similarly, SO₂ is considered a precursor of PM_{2.5}.

B.4.2 De Minimis Emissions Levels

Under the GCR, threshold (*de minimis*) rates of emissions were established for those Federal actions with the potential to have

significant air quality impacts. Table B-2 summarizes these thresholds.

Table B-2
De Minimis Emission Levels for Criteria Air Pollutants

Pollutant	Nonattainment Designation	Tons/Year
Ozone*	Serious	50
	Severe	25
	Extreme	10
	Other nonattainment or maintenance areas outside ozone transport region	100
	Marginal and moderate nonattainment areas inside ozone transport region	50/100**
Carbon Monoxide	All	100
Sulfur Dioxide	All	100
Lead	All	25
Nitrogen Dioxide	All	100
Particulate Matter ≤ 10 microns	Moderate	100
	Serious	70
Particulate Matter ≤ 2.5 microns***	All	100
Notes * Applies to ozone precursors - volatile organic compounds (VOCs) and nitrogen oxides (NO _x). ** VOCs/NO _x *** Applies to PM _{2.5} and its precursors.		

B.4.3 Regional Significance

A Federal action that results in emissions that do not exceed the *de minimis* for a criteria pollutant may still be subject to a general conformity determination if the direct and indirect emissions from the action exceed 10 percent of the total emission inventory for a particular criteria pollutant in a nonattainment or maintenance area. If the emissions exceed this ten percent threshold, the Federal action is considered to be a "regionally significant" activity.

B.4.4 Analysis

Pursuant to the GCR, all reasonably foreseeable emissions (both direct and indirect) associated with the proposed action were quantified and compared to the annual *de minimis* levels to determine potential emissions impacts.

Direct emissions are emissions of a criteria pollutant or its precursors that are caused or initiated by a Federal action and occur at the same time and place as the action. Indirect emissions, occurring later in time and/or further removed in distance from the action itself, must be included in the determination if both of the following apply:

- The Federal agency can practicably control the emissions and has continuing program responsibility to maintain control.
- The emissions caused by the Federal action are reasonably foreseeable.

Increased direct and indirect emissions from the demolition and construction associated with the proposed action would result from the following potential activities:

- Use of diesel and gas-powered construction equipment.
- Movement of trucks containing construction and removal materials.
- Commuting of construction workers.

The change in operational emissions would result from the change in workplace location due to the proposed action, which would cause an increase in the total vehicle miles traveled (VMT). (Another operational source - the boilers of the new facility - would contribute some emissions; however, at this stage, sufficient information is not available to quantify these emissions. Based on previous experience, and how much below the *de minimis* the estimated emissions are, boiler-related emissions are not expected to make any significant difference).

In estimating construction-related emissions, equipment usage and the duration of construction activities first were determined based on the size of the facility to be constructed. The increased emissions were then calculated using USEPA guidance and emission factors.

The Navy is proposing to construct a 32,000 square feet (SF) administrative building and a 23,000 SF warehouse. Integrated into the construction are exterior lighting, paved parking and driving areas, roadways and sidewalks, stormwater management facilities, and landscaping. The preferred alternative involves siting the facility on approximately three acres northwest of the intersection of Brookley Avenue and Thomas Road at NSF

Anacostia. The alternative option is to site the facility on a three-acre parcel at Bellevue Housing.

B.4.5 Construction Emissions

B.4.5.1 Activity Data

In estimating construction-related emissions, assumptions about the usage of equipment, the likely duration of each activity, and manpower estimates for the construction were based on the information contained in the EA and supporting documentation. The weekly duration of each activity was assumed to be eight hours per day and five days per week. Estimates as to construction crew and equipment requirements and productivity are based on data presented in:

- *2003 RS Means Facilities Construction Cost Data*, R.S. Means Co., Inc., 2002

The proposed action includes two basic types of activities:

- Relocation or demolition of:
 - Several semi-permanent buildings.
 - Parking or other paved areas.
 - Rough grading of the entire three-acre site in preparation for construction.
- Construction of:
 - Administration building.
 - Warehouse building.
 - Open space including lighting, roadway improvements, paved parking and driving areas, sidewalks, storm water management, and landscaping.

All equipment to be used is assumed to be diesel-powered unless otherwise noted. Each piece of equipment is assumed to be operated continuously for six hours during each working day. Pieces of equipment to be used for the construction and demolition activities include, but are not limited to:

- Compressors.
- Cranes.
- Dozers.
- Drill rig and auger.

- Gas engine vibrators.
 - Gas welding machines.
 - Graders.
 - Loaders.
 - Pavement breakers.
 - Pavers.
 - Pumps.
 - Rollers.
-

B.4.5.2 Equipment Emission Estimates

Estimates of operational emissions from construction equipment were calculated based on the estimated hours of equipment use and the emission factors for each type of equipment. Emission factors for VOC, NO_x, and CO were taken from USEPA's NONROAD emission factor model using the national default model inputs for nonroad engines, equipment, and vehicles of interest provided with the model (USEPA December 2008). The average equipment horsepower (hp) values and equipment power load factors were also provided by the NONROAD model. Emission factors related to construction-associated delivery trucks were estimated using the USEPA's Mobile6 emission factor model because the model provides a specific emission factor database for various truck classifications.

Emission factors (in grams of pollutant per hour per horsepower) were multiplied by the estimated running time and equipment average horsepower to calculate the total grams of pollutant from each piece of equipment. Finally, the total grams of pollutant were converted to tons of pollutant.

The USEPA recommends the following formula to calculate hourly emissions from nonroad engine sources including cranes, backhoes, etc.:

$$M_i = N \times HP \times LF \times EF_i$$

Where:

- M_i = mass of emissions of *i*th pollutants during inventory period;
- N = source population (units);
- HP = average rated horsepower;
- LF = typical load factor; and
- EF_i = average emissions of *i*th pollutant per unit of use (e.g., grams per horsepower-hour).

Typical load factor values were obtained from *Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling* (USEPA, December 2008).

Estimated emissions from the operation of on-site construction equipment is presented in Table B-3. A sample calculation for a front end loader engine NO_x emissions during construction is provided below:

$$\begin{aligned} \text{Operational Hours} &= 79 \text{ hours (1 loader x 13 days} \\ &\quad \text{x 6 hr/day)} \\ \text{Operational Emissions} &= 79 \text{ hours x 93 hp x 21\% x 5.14} \\ &\quad \text{grams/hp-hr} \\ &= 0.01 \text{ tons (Table B-3)} \end{aligned}$$

B.4.5.3 Vehicle Emission Estimates

Truck and worker's vehicle operations would result in indirect emissions. However, the only activities that can be reasonably quantified are vehicle operations within NSF Anacostia. Construction-related motor vehicle operations within the installation are assumed to be as follows:

- Pickup, dump and other construction-related trucks would travel at an average speed of 25 miles per hour (mph), for a total estimated on-base running time of two hours per working day.
- Each worker's vehicle would take a 20-minute round trip within NSF Anacostia at an average speed of 25 mph.

Emission factors for motor vehicles were calculated for both trucks (including dump, delivery and tractor trucks that were modeled as heavy-duty diesel vehicles) and commuter vehicles (modeled as light-duty gasoline vehicles) using the Mobile 6.2 mobile source emission factor model with Washington DC area-specific modeling input parameters provided by WMCOG. The modeled emission factors were then multiplied by the estimated vehicle operational hours to determine motor vehicle emissions. Tables B-4 and B-5 show the worksheets for estimating vehicular emissions associated with 2010 construction activities.

B.4.5.4 Asphalt Curing Emission Estimates

Asphalt curing-related VOC emissions were estimated based on the amount of paving anticipated for parking lots and roadways. The following assumptions were used:

- Pavement would consist of hot mix asphalt concrete.
- Emulsified asphalt would be used for Tack Coats, with an application rate of 0.15 gal/yd² (VDOT, 2002) and an emission factor of 0.219 lbs/ton (Metropolitan Washington Air Quality Committee, May 21, 2004).
- Cutback asphalt would be used for Prime Coats, with an application rate of 0.25 gal/yd² (VDOT, 2002) and an emission factor of 2.095 lbs/ton (Metropolitan Washington Air Quality Committee, May 21, 2004).

The calculation of asphalt concrete paving VOC emissions is provided below:

Estimated pavement area = 8,280 yd²
 Asphalt density = 8.34 lb/gal

$$\begin{aligned}
 \text{Total VOC} &= (8,280 \text{ yd}^2) \times [(0.15 \text{ gal/yd}^2 \times 0.219 \\
 &\text{lbs/ton}) + (0.25 \text{ gal/yd}^2 \times 2.095 \text{ lbs/ton})] \times \\
 &(8.34 \text{ lbs/gal}) / (4,000,000 \text{ lbs}^2/\text{ton}^2) \\
 &= 0.015 \text{ tons}
 \end{aligned}$$

Table B-3
Construction Equipment Emissions Worksheet

Equipment Type/Activity	Number of Units	Weeks	Hours	Horsepower ¹ (hp)	Load Factor ¹ (%)	Emission Factor ¹ (grams/hp-hour)				Emission Rate (tons/year)			
						SO ₂	PM _{2.5}	NOx	VOC	SO ₂	PM _{2.5}	NOx	VOC
Demolition													
Backhoe loader, 48hp	1	2.6	79	48	21	0.14	0.98	6.80	1.47	0.00	0.00	0.01	0.00
Front end loader, 2.5 cy	1	2.6	79	93	21	0.14	0.98	6.80	1.47	0.00	0.00	0.01	0.00
Pavement removal bucket	1	2.6	79	171	59	0.12	0.28	4.25	0.32	0.00	0.00	0.04	0.00
Total Demolition Emissions for year 2010										0.00	0.01	0.06	0.01
Construction													
Asphalt paver, 130 HP	1	0.6	18	130	59	0.12	0.35	4.59	0.38	0.00	0.00	0.01	0.00
Backhoe loader, 48hp	1	3.4	101	48	21	0.14	0.98	6.80	1.47	0.00	0.00	0.01	0.00
Centrif. Water pump, 6"	1	0.6	18	53	43	0.12	0.56	6.18	0.75	0.00	0.00	0.00	0.00
Compressor, 250 cfm	1	67.8	2034	83	43	0.12	0.43	5.42	0.54	0.01	0.03	0.43	0.04
Concrete pump, small	1	22.6	678	53	43	0.12	0.56	6.18	0.75	0.00	0.01	0.10	0.01
Crane, 90-ton	1	58.4	1752	231	43	0.11	0.24	5.14	0.35	0.02	0.05	0.99	0.07
Crane, SP, 12 ton	1	6.0	180	231	43	0.11	0.24	5.14	0.35	0.00	0.00	0.10	0.01
Diesel hammer, 41k ft-lb	1	45.8	1374	329	59	0.12	0.37	5.60	0.42	0.03	0.11	1.64	0.12
Drill rig & augers	1	0.6	18	176	43	0.12	0.42	6.68	0.57	0.00	0.00	0.01	0.00
Dozer, 75 HP	1	8.6	258	75	59	0.12	0.29	4.72	0.33	0.00	0.00	0.06	0.00
Dozer, 300 HP	1	1.0	30	300	59	0.12	0.29	4.72	0.33	0.00	0.00	0.03	0.00
Front end loader, 1.5 cy	1	2.6	78	93	21	0.14	0.98	6.80	1.47	0.00	0.00	0.01	0.00
Front end loader, TM, 2.5cy	1	0.2	5	93	21	0.14	0.98	6.80	1.47	0.00	0.00	0.00	0.00
Gas engine vibrator	1	8.2	246	6	55	0.22	0.17	2.78	26.08	0.00	0.00	0.00	0.02
Gas welding machine	1	56.4	1692	17	68	0.21	0.10	3.24	11.35	0.00	0.00	0.07	0.25
Grader, 30,000 lb	1	1.2	36	204	59	0.12	0.27	4.26	0.32	0.00	0.00	0.02	0.00
Pneumatic wheel roller	1	0.6	18	92	59	0.12	0.40	4.77	0.42	0.00	0.00	0.01	0.00

Relocation of NSMA to NSF Anacostia, District of Columbia

Equipment Type/Activity	Number of Units	Weeks	Hours	Horsepower ¹ (hp)	Load Factor ¹ (%)	Emission Factor ¹ (grams/hp-hour)				Emission Rate (tons/year)			
						SO ₂	PM _{2.5}	NO _x	VOC	SO ₂	PM _{2.5}	NO _x	VOC
Pavement removal bucket	1	0.2	5	171	59	0.12	0.28	4.25	0.32	0.00	0.00	0.00	0.00
Roller, vibratory	1	1.0	30	92	59	0.12	0.40	4.77	0.42	0.00	0.00	0.01	0.00
Rollers, steel wheel	1	1.0	30	92	59	0.12	0.40	4.77	0.42	0.00	0.00	0.01	0.00
Total Construction Emissions for 2010										0.08	0.22	3.51	0.54
Total Annual Construction Emissions for 2010										0.08	0.22	3.57	0.55
Source: 1. Nonroad model worksheet, EPA Dec. 31, 2008.													

Table B-4
Demolition Motor Vehicle Emissions Worksheet

Demolition Activity	Hours of Operation	Emission Factor (lbs/hr)				Emissions (tons)			
		VOC	NO _x	PM _{2.5}	SO ₂	VOC	NO _x	PM _{2.5}	SO ₂
<i>Trucks (HDDV)</i>	120	0.02	0.27	0.01	0.00	0.001	0.016	0.000	0.000
Total trucks =	4								
Total working days =	15								
Running hrs per veh per day =	2								
<i>Cars (LDGV)</i>	20	0.03	0.03	0.00	0.00	0.000	0.000	0.000	0.000
Total cars =	4								
Total working days =	15								
Running mins per veh per day =	20								
Total Motor Vehicle Emissions						0.001	0.016	0.000	0.000

Table B-5
Construction Motor Vehicle Emissions Worksheet

Construction Activity	Hours of Operation	Emission Factor (lbs/hr)				Emissions (tons)			
		VOC	NO _x	PM _{2.5}	SO ₂	VOC	NO _x	PM _{2.5}	SO ₂
<i>Trucks (HDDV)</i>	5050	0.02	0.27	0.01	0.00	0.057	0.690	0.016	0.002
Total trucks =	25								
Total working days =	101								
Running hrs per veh per day =	2								
<i>Cars (LDGV)</i>	6167	0.03	0.03	0.00	0.00	0.078	0.078	0.002	0.001
Total cars =	50								
Total working days =	370								
Running mins per veh per day =	20								
Total Motor Vehicle Emissions						0.135	0.768	0.018	0.003

B. 4.6 Operational Vehicular Emissions

The change in vehicular operational emissions due to the proposed relocation was predicted based on the change in VMT forecasted by estimating the average road distance from employee residences to their workplace for existing and future conditions. The same methods used for construction worker commuting vehicle emission estimates were then used for predicting employee operation vehicle emissions (Table B-7).

B.4.7 Compliance Analysis

Based on the results of the analysis of NO_x, VOC, PM_{2.5}, and SO₂ emissions performed consistent with the Final Rule for *Determining Conformity of Federal Actions to State or Federal Implementation Plans*, the proposed action would not require a formal conformity determination. The results of this analysis are presented in Table B-8. These results show no exceedance of the *de minimis* criteria of 100 tpy for NO_x, PM_{2.5}, and SO₂ and 50 tpy of VOC on an annual basis. Furthermore, the project would not be regionally significant because it would result in emissions that do not make up ten percent or more of the regional emission inventory for NO_x, VOC, PM_{2.5}, and SO₂. Therefore, the proposed action would have minimal air quality impacts and would not require a formal conformity determination.

Table B-7
Total Operational Vehicle Emissions

	Total VMT	VMT (road type)	Speed (mph)	Emission Factors (g/mi)				Emissions (tons)			
				VOC	NO _x	SO ₂	PM _{2.5}	VOC	NO _x	SO ₂	PM _{2.5}
No Build											
Arterial	38,959	11687.7	25	0.493	0.403	0.0068	0.0114	0.0064	0.0052	0.0001	0.0001
Expressway		27271.3	55	0.393	0.389	0.0068	0.0114	0.0118	0.0117	0.0002	0.0003
<i>Total</i>								0.0182	0.0169	0.0003	0.0005
Build											
Arterial	42,170	12651.0	25	0.493	0.403	0.0068	0.0114	0.0069	0.0056	0.0001	0.0002
Expressway		29519.0	55	0.393	0.389	0.0068	0.0114	0.0128	0.0127	0.0002	0.0004
<i>Total</i>								0.0197	0.0183	0.0003	0.0005
<i>Net Increase (Build - No Build)</i>								0.0015	0.0014	0.0000	0.0000

Table B-8
Total Annual Emissions Levels

Emission Source	Pollutant (tons/year)			
	VOC	NO _x	PM _{2.5}	SO ₂
Construction Year				
Construction Equipment	0.55	3.57	0.22	0.08
Motor Vehicles	0.14	0.77	0.02	0.00
Paving	0.02	-	-	-
Total Construction Annual Emissions	0.71	4.34	0.24	0.08
Operational Year ¹				
Motor Vehicles	0.001	0.002	0.000	0.000
<i>De Minimis Level</i>	<i>50</i>	<i>100</i>	<i>100</i>	<i>100</i>
<i>10% 2009 Regional Emission Inventory²</i>	<i>12,702</i>	<i>13,213</i>	<i>2,336</i>	<i>23,190</i>
<p>1. Emissions from the proposed facility's boiler(s) are not included due to lack of information needed for a quantitative estimate; however, based on the size of the building and the existing total emissions at the installation, , they are not likely to result in an exceedance of the <i>de minimis</i>.</p> <p>2. MWCOG PM_{2.5} State Implementation Plan, March 7, 2008.</p>				

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RECORD OF NON-APPLICABILITY
IN ACCORDANCE WITH THE
CLEAN AIR ACT - GENERAL CONFORMITY RULE
FOR
RELOCATION OF THE NAVY SYSTEMS MANAGEMENT ACTIVITY
TO NAVAL SUPPORT FACILITY ANACOSTIA
DISTRICT OF COLUMBIA

The Clean Air Act (CAA) requires federal actions in air pollutant non-attainment or maintenance areas to conform to an applicable State Implementation Plan (SIP). The SIP is designed to achieve or maintain an attainment designation for air pollutants as defined by the National Ambient Air Quality Standards (NAAQS). The regulations governing this requirement are found in 40 CFR Parts 51 and 93, also known as the *General Conformity Rule*.

The proposed action considered in this document is to relocate the Navy Systems Management Activity (NSMA) from several leased locations in Arlington County, VA to a new facility at Naval Support Facility (NSF) Anacostia in Washington, DC, in compliance with the Base Realignment and Closure (BRAC) Act of 2005. The Washington DC area is currently designated as a moderate non-attainment area for ozone (O₃) and a non-attainment area for particulate matter 2.5 micrometers or less in size (PM_{2.5}). Therefore, the proposed action must comply with the requirements of the *General Conformity Rule*.

Provisions in the CAA regulations (40 CFR Sect 51.853(c)(1)) allow for exemptions from performing a conformity determination if the total emissions of individual non-attainment or maintenance area pollutants resulting from a proposed action would fall below specific threshold values (*de minimis* levels). For O₃, *de minimis* are set for the precursor compounds nitrogen oxides (NO_x) and volatile organic compounds (VOC).

As shown by the information in Table 1 (see Attachment), emissions of non-attainment pollutants caused by the proposed action would not exceed the applicable *de minimis* levels of 50 tons per year for VOC and 100 tons per year each for NO_x and PM_{2.5}. Therefore, the action is exempt from the requirements of the *General Conformity Rule*.

To the best of my knowledge, the information provided herein is correct and accurate and I concur in the finding that the proposed relocation of NSMA to NSF Anacostia, District of Columbia, would conform to the applicable SIP.

Approved by



Date 9/16/2009

RICHARD P. LAFRENIERE
IEPM, NSA WASH PWD

ATTACHMENT

**RELOCATION OF NSMA TO NSF ANACOSTIA
DISTRICT OF COLUMBIA**

Table 1
Total Projected Annual Emission Levels

Emission Source	Pollutant (tons/year)			
	VOC	NO _x	PM _{2.5}	SO ₂
Construction Period Activities				
Construction Equipment	0.55	3.57	0.22	0.08
Motor Vehicles	0.14	0.77	0.02	0.00
Paving	0.02	-	-	-
Total Construction Annual Emissions	0.71	4.34	0.24	0.08
Operational Period Activities				
Motor Vehicles	0.001	0.002	0.000	0.000
Total Operation Annual Emissions	0.001	0.002	0.000	0.000
<i>De Minimis Level</i>	50	100	100	100
<i>10% 2009 Regional Emission Inventory¹</i>	12,702	13,213	2,336	23,190

Source: 1. MWCOG PM_{2.5} SIP, March 7, 2008.

APPENDIX C

Traffic Impact Study

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Traffic Impact Study

Relocation of
Navy Systems Management Activity (NSMA)
To Naval Support Facility Anacostia
District of Columbia

Prepared for:
NAVFAC Washington
Washington, DC

Prepared by:
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June 2009

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Attachment A	Turning Movement Counts
Attachment B	Highway Capacity Analysis Printouts
Attachment C	Peak Hour Traffic Volume Maps
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1.0 PROJECT OVERVIEW

This traffic impact study was prepared to support the Environmental Assessment (EA) for the Relocation of the Navy Systems Management Activity (NSMA) to Naval Support Facility (NSF) Anacostia, Washington, DC. Figure 1 shows the location of NSF Anacostia.

The study's purpose is to evaluate the impacts on local traffic that would result from the proposed relocation of 800 NSMA employees from their current, multiple workplaces in Arlington County, Virginia, to one consolidated facility on NSF Anacostia, at a site northwest of the intersection of Brookley Avenue and Thomas Road (Preferred Site, see Figure 2). The proposed relocation is in compliance with the 2005 Base Realignment and Closure (BRAC) Act of 2005, which mandates the closure of several leased Navy installations in the National Capital Region and the relocation of the organizations occupying these installations to Department of Defense (DoD)-owned space in the National Capital Region.

The study also considers the impacts of relocating the 800 NSMA employees to a similar facility built at an alternative location (shown on Figure 2). This alternative site is part of the Bellevue Housing development south of NSF Anacostia and Bolling Air Force Base (AFB).

The relocation of NSMA to its new facility is scheduled to be completed by September 2011. Therefore, 2011 is the target year for this study.

2.0 PROPOSED DEVELOPMENT

2.1. Project Location

NSF Anacostia is located in the southwestern quadrant of the District of Columbia, along the eastern shore of the Anacostia River, near the river's confluence with the Potomac. The installation is across the Potomac from Arlington County, where existing NSMA facilities are located (See Figure 2).

In compliance with the 2005 BRAC Act, NSF Anacostia is in the process of becoming a joint base with Bolling AFB, home to the US Air Force's 11th Wing, located immediately to the south of NSF Anacostia. The Anacostia-Bolling joint base will be managed by the Navy. NSF Anacostia and Bolling AFB, although historically administratively distinct, are physically continuous and share a perimeter fence and entry gates (North, Main [or Arnold], and South gates, shown on Figure 2). Together, they occupy 958 acres (351 acres for NSF Anacostia and 607 acres for Bolling AFB) bounded by the Anacostia River and the Potomac River to the west, South Capitol Street and Interstate Highway 295 (I-295) to the east, Poplar Point and the Frederick Douglass

Memorial Bridge to the north, and the Naval Research Laboratory (NRL) and Bellevue Housing to the south. Part of Bellevue (including the alternative site) is included within the Bolling-Anacostia boundary.

2.2 Site Plan

A layout of the proposed combined facility at the preferred site is shown in Figures 3 and 4. The facility will include 46 parking spaces. Nearby existing parking lots and garages (all located on the installation) will provide additional parking for employees.

2.3 Existing Land Use

Area Land Use

The Bolling-Anacostia installation occupies part of a long and relatively narrow strip of land extending between the Potomac and Anacostia rivers to the north and west, and South Capitol Street, Overlook Avenue, and I-295 to the east and south. In addition to the installation, this stretch of waterside land contains other large institutional compounds such as NRL and, farther south, the District of Columbia's Blue Plains wastewater treatment plant. Large tracts of military family housing (Air Force Housing on Bolling AFB and the Navy's Bellevue Housing) are also present.

The area east of I-295 is predominantly in residential use (Barry Farm and Congress Heights neighborhoods), though a large institutional compound - the 173-acre St. Elizabeth's West Campus, currently being prepared for use by the US Department of Homeland Security - is also present, overlooking NSF Anacostia from across the interstate. To the north of NSF Anacostia, the shore of the Anacostia River is occupied by parkland (Poplar Point, Anacostia Park).

Across the Anacostia River and west of South Capitol Street, land use consists primarily of low-density commercial and industrial areas with some residential developments. The area east of South Capitol Street is in a transitional stage. Formerly characterized by warehouses, nightclubs, and industrial uses, it has undergone extensive redevelopment centered on such large-scale projects as the Washington Nationals Major League Ballpark, between N Street and Potomac Avenue SE; the US Department of Transportation on M Street; and numerous new office and residential buildings and developments along M Street and New Jersey Avenue. Redevelopment of the Southeast Federal Center, on M Street, into a new mixed-used neighborhood, has also begun.

Project Site Land Use

The preferred site is currently mostly vacant. Its northern half was previously occupied by Building 150, an administrative facility now demolished (see Figure 4). The southern half of the site is occupied

Area Map



- Interstate
- Highway
- Major Road
- Local Road
- Water Body

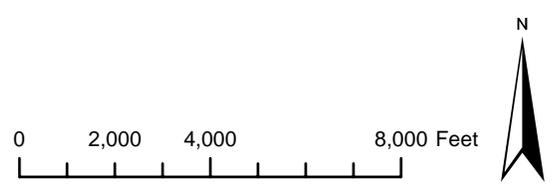


Figure 1

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Project Location Map



-  Navy Perimeter
-  Bellevue Housing
-  Preferred Site (Anacostia Alternative)
-  Alternate Site (Bellevue Alternative)

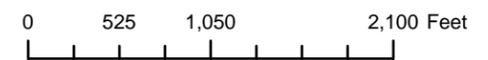
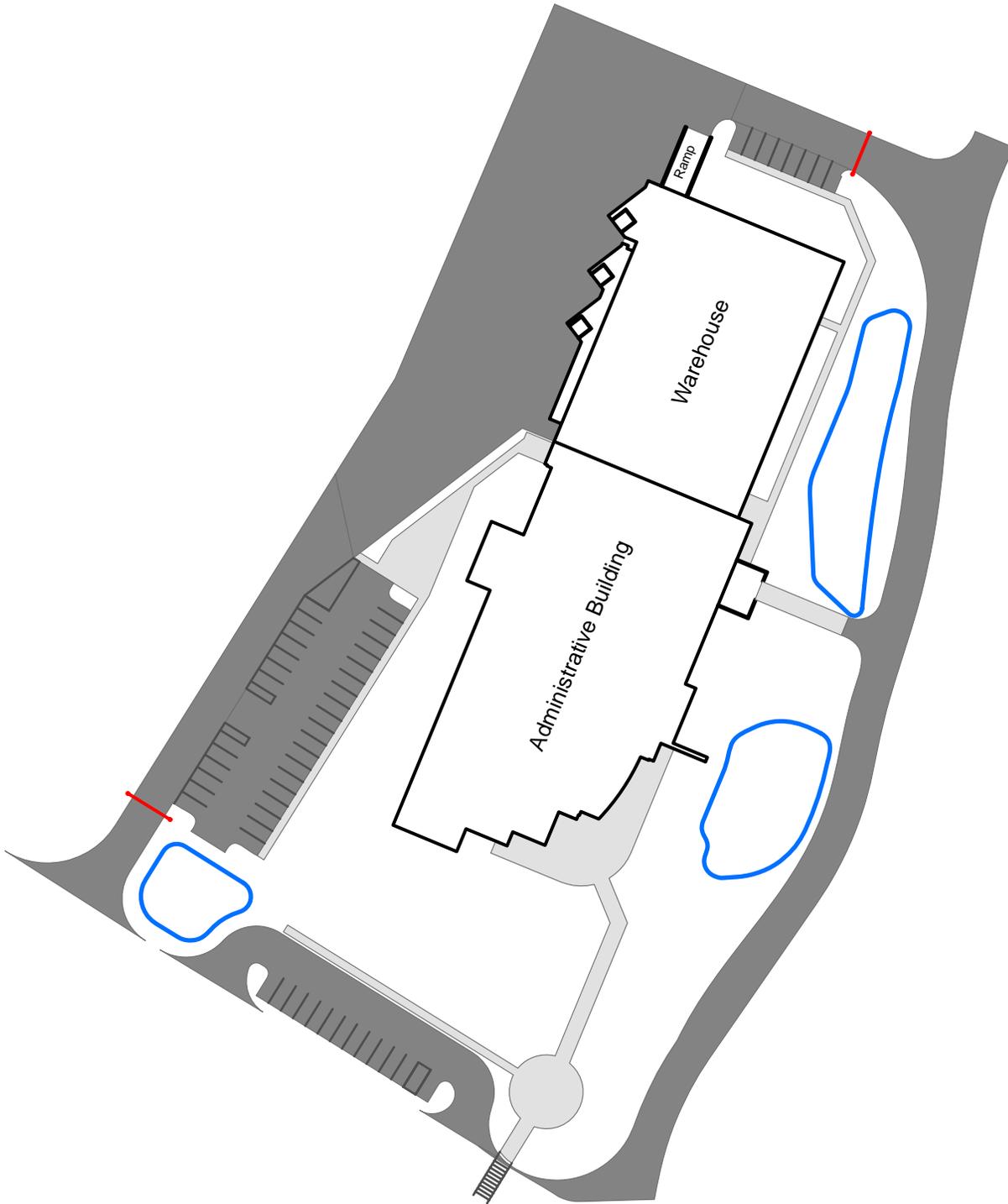


Figure 2

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Proposed Combined Facility



- Gate
- Sidewalk
- Pavement
- Stormwater Management Pond

0 50 100 200 Feet



Figure 3

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Proposed Combined Facility at Preferred Site

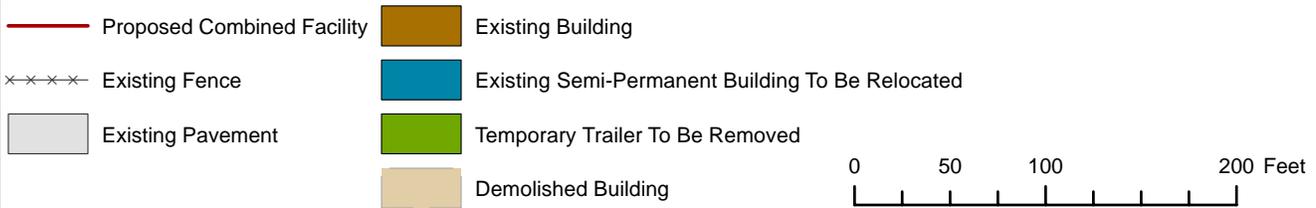
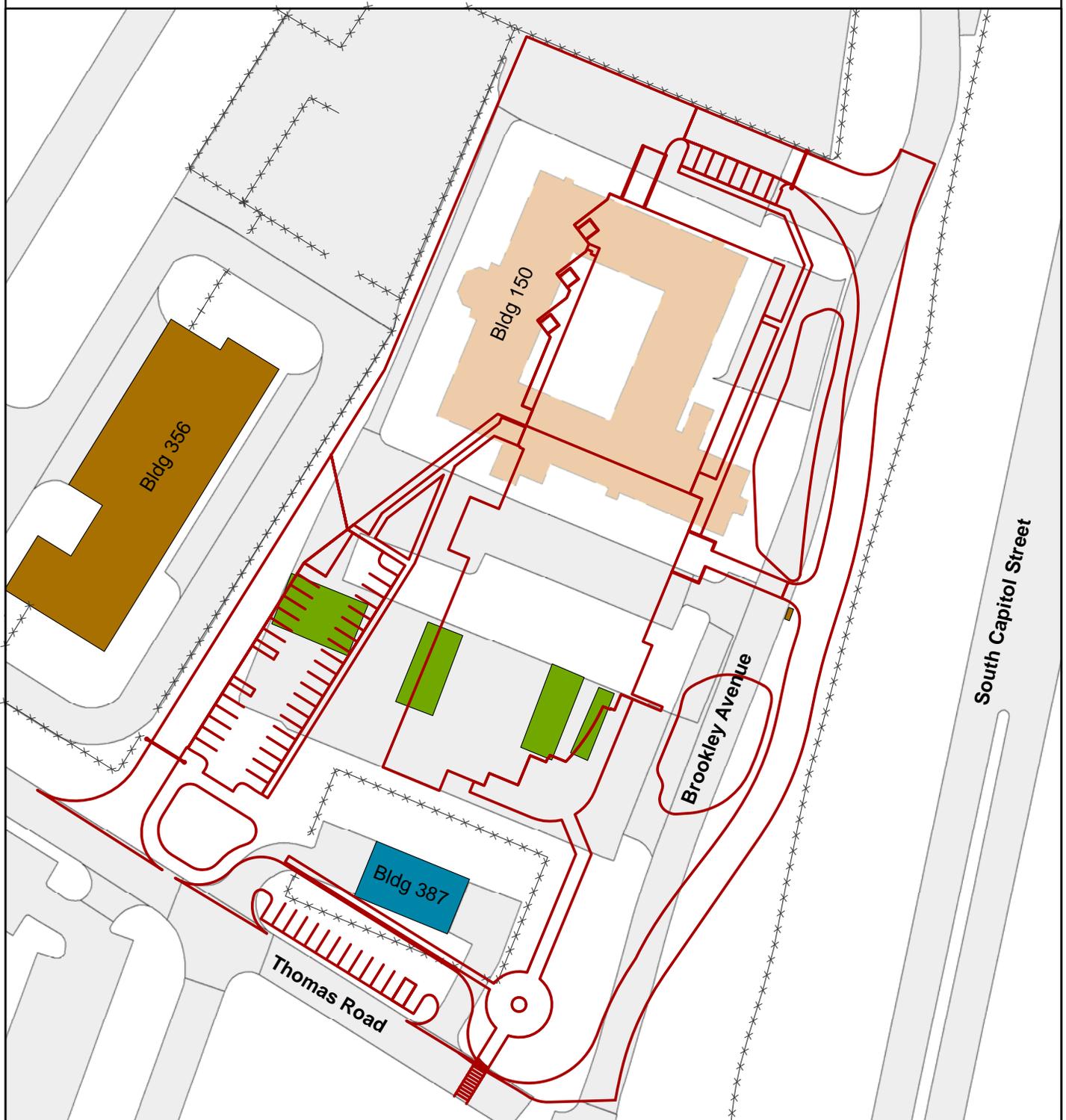


Figure 4

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by a parking lot and several trailers that will be relocated to make room for the new facility. Nearest Thomas Road, Building 387, a semi-permanent facility, will be relocated as well. The alternative site is vacant and undeveloped.

2.4 Proposed Land Use

The proposed action will change the land use of the project site by building a new facility that will comprise (1) an administrative building with approximately 160,000 gross square feet of space and a footprint of approximately 32,000 square feet and (2) a warehouse approximately 23,000 square feet in size (see Figure 3). The warehouse will have three loading docks; on average, no more than three tractor trailers a day will access or leave the facility, although they will not do so every day. Smaller delivery trucks will also access the facility on a daily basis.

2.5 Phasing and Timing

The facility is planned to be operational with all personnel, equipment, and program moved in by September 2011.

2.6 Study Area

The study area for this project is bounded by the Anacostia River on the north, I-295 on the east, the NRL campus on the south, and the Potomac River on the west. Figure 5 shows the six intersections that are being evaluated in this study.

2.7 Planned Roadway Improvements

Several transportation improvement projects are planned in the vicinity of the study area, including:

- Realignment of the Frederick Douglass Memorial Bridge and new signalized traffic circle at South Capitol Street and Suitland Parkway (2012).
- Reconstruction of the 11th Street bridges with a new full interchange with the Anacostia Freeway to separate local and interstate traffic via two bridges (2013).
- Construction of a new urban diamond I-295/Suitland Parkway Interchange (2015).
- Reconstruction of the Malcolm X Avenue/I-295 interchange to connect to a new road that will extend between Firth Sterling Avenue and Malcolm X Avenue and provide access to the West Campus of St. Elizabeth's Hospital (2016).

The 11th Street bridges project, the South Capitol Street project, and the I-295/Suitland Interchange modification are included in the Anacostia Waterfront Initiative Transportation Master Plan and are programmed in the Constrained Long Range Plan (CLRP) and the Transportation Improvement Program (TIP).

The listed roadway improvements have not been included in the evaluation of no-action conditions presented here because none are expected to be completed by 2011, the horizon year for this study.

2.8 Planned Development Projects

Similarly, no planned and approved development projects within or near the study area are expected to have an impact on traffic conditions by 2011. No significant net change to the installation's personnel loadings (both Bolling and Anacostia) is expected by 2011. In the installation's vicinity, the relocation of the Department of Homeland Security to the West Campus of St. Elizabeth's Hospital is scheduled for 2016; the completion of the Barry Farm renovation project is expected by 2018; no definitive plans or schedule are currently available for the redevelopment of Poplar Point, which, for this reason, is not included in the latest MWCOG population projections.

3.0 EXISTING CONDITIONS

3.1 Roadway Inventory

The roadways within the study area that are expected to be directly impacted by the proposed action are discussed in this section. Figure 6 shows the roadway classification for the area's network.

- The **I-295** section of the Anacostia Freeway is classified as an interstate highway. It branches off the Southeast-Southwest Freeway in Northeast DC, crosses the Anacostia River on the 11th Street Bridge, then runs southward to the Capital Beltway (I-495) near the Woodrow Wilson Bridge in Prince Georges County, Maryland. To the northeast, the I-295 section of the Anacostia Freeway connects with the DC 295 section of the Anacostia Freeway/Kenilworth Avenue corridor, providing access to the Baltimore Washington Parkway and US 50. Within the study area, I-295 runs in a north-south direction. Northbound I-295 provides access to Bolling AFB's main gate via Malcolm X Avenue. The speed limit is 50 miles per hour (MPH). Annual Daily Traffic (ADT) is 85,000 vehicles.
- **South Capitol Street** is classified as an expressway south of M Street and along the Frederick Douglass Memorial Bridge over the Anacostia River, past which it continues south, parallel to I-295. The classification of the roadway changes from expressway to minor arterial south of its intersection with Firth Sterling

Study Intersections



- Navy Perimeter
- Bellevue Housing
- Preferred Site (Anacostia Alternative)
- Alternate Site (Bellevue Alternative)

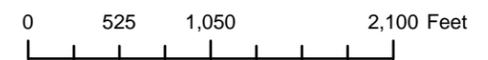


Figure 5

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Avenue, SE. There is direct access to the installation's North and Main gates from South Capitol Street. The posted speed limit is 35 MPH north of Firth Sterling Avenue and 40 MPH south of Firth Sterling Avenue. ADT is 52,750 vehicles.

- **Firth Sterling Avenue** is a four-lane collector road that runs southwest to northeast between South Capitol Street and Howard Road, SE. This road is a main route for any motorists and pedestrians traveling between NSF Anacostia, the Anacostia Metrorail Station, and Historic Anacostia. Firth Sterling Avenue also provides access to the Barry Farm neighborhood. The speed limit on Firth Sterling Avenue is 25 MPH. ADT is 10,600 vehicles.
- **Malcolm X Avenue** is a two- to four-lane urban minor arterial that runs east-west and extends from 8th Street on the east, across MLK Avenue, to South Capitol Street. At its west end with South Capitol Street, Malcolm X Avenue connects directly with the Main Gate of Bolling AFB. The speed limit along Malcolm X Avenue is 30 MPH. Parking is allowed on both sides of Malcolm X Avenue east of the I-295 on/off ramps. ADT is 12,800 vehicles.
- **Overlook Avenue SW** is a two- to four-lane collector road that runs north-south and parallel to I-295 between South Capitol Street (where South Capitol Street turns southeastward) and the Blue Plains wastewater treatment plant. Overlook Avenue SW provide direct access to the South Gate of Bolling AFB. The speed limit along Overlook Avenue SW is 30 MPH. ADT is 13,000 vehicles.
- **Chesapeake Street SW** is a four-lane collector road that runs east-west between 1st Street, SE and Overlook Avenue, SW. Chesapeake Street, SW provides access to the South Gate of Bolling AFB via Overlook Avenue. The speed limit along Chesapeake Street, SW is 30 MPH. Annual Daily Traffic (ADT) is 10,600 vehicles.

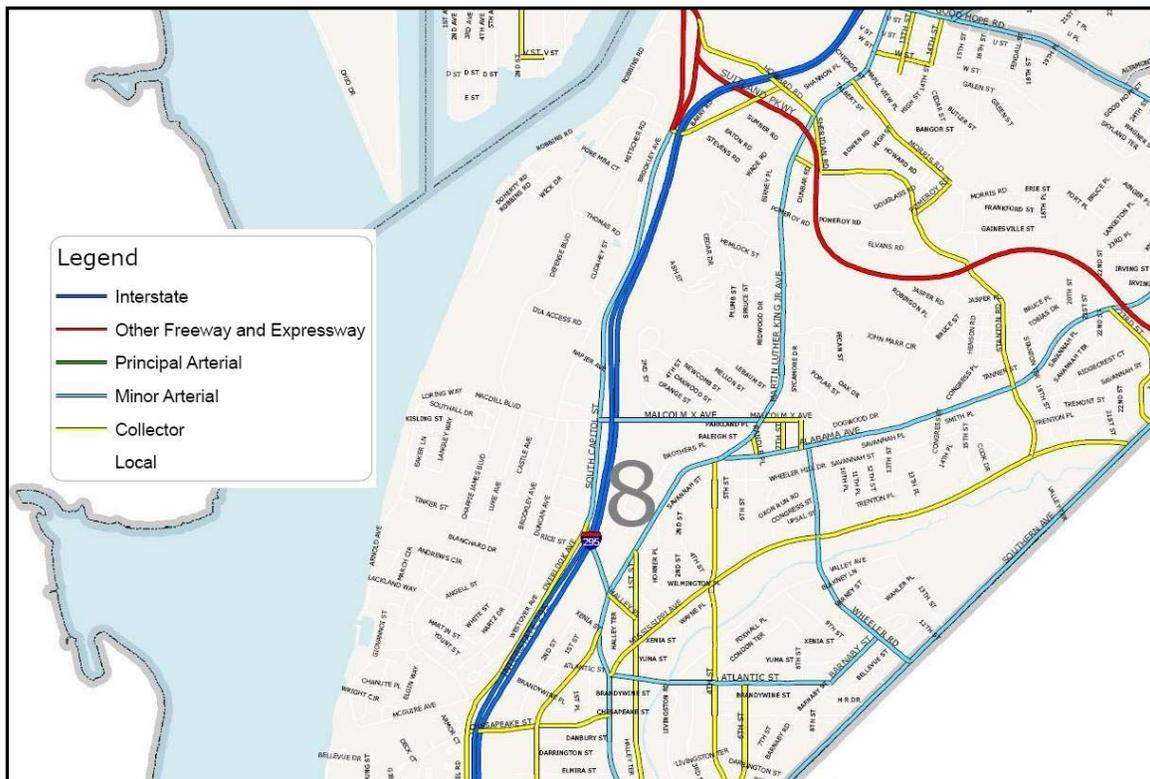


Figure 6. Roadway Classification

3.2 Existing Traffic Volumes

To determine existing traffic operations in the study area, manual traffic turning movement counts were taken on Tuesday March 17 and Wednesday March 18, 2009, during the AM (6:30-8:30) and PM (3:30-5:30) peak periods at the following six intersections (see Figure 5):

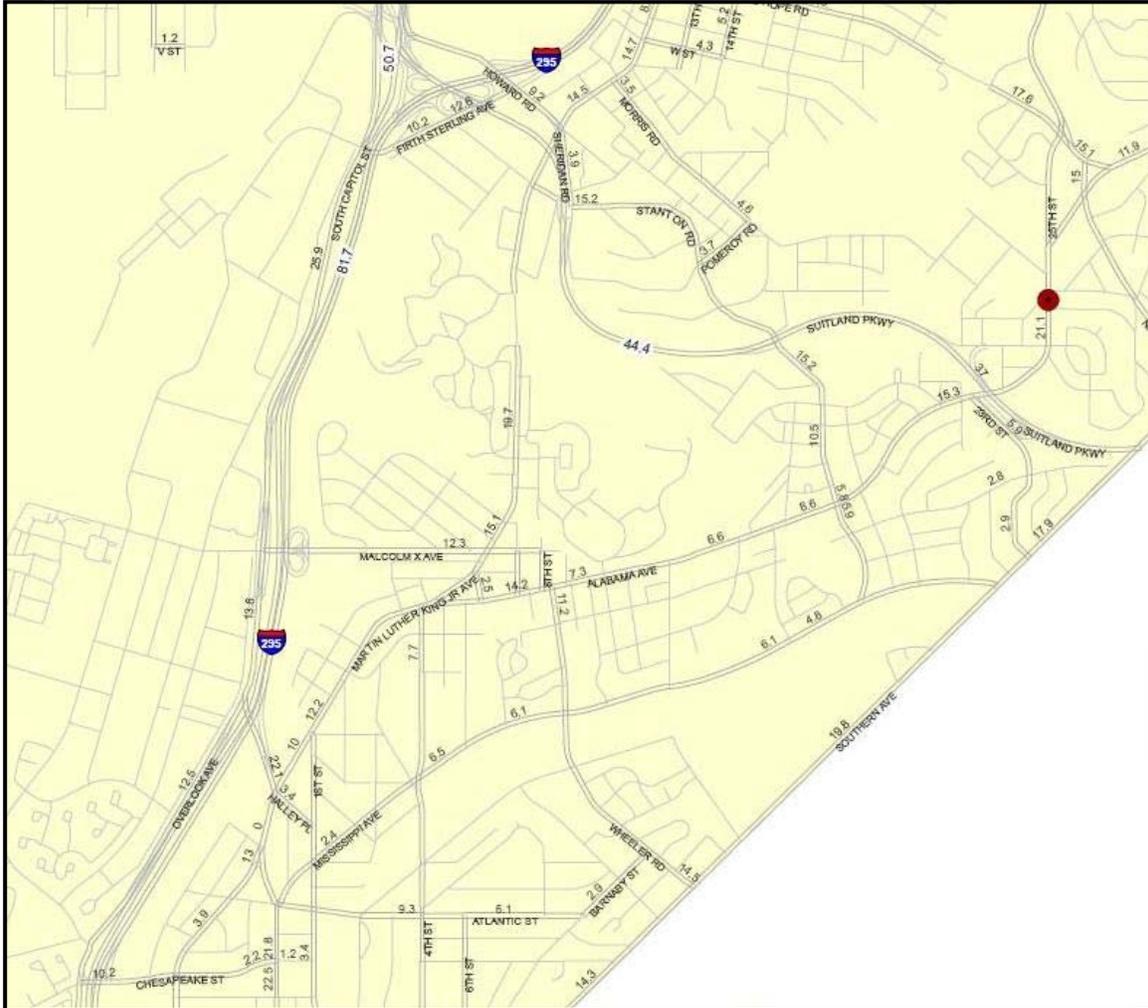
1. South Capitol St. (Southbound) and Malcolm X Ave. (signalized)
2. South Capitol St. (Northbound) and Malcolm X Ave. (signalized)
3. I-295 off ramp at Malcolm X Ave. SE (un-signalized)
4. South Capitol St. at Firth Sterling Ave. (signalized)
5. Overlook Ave. SW at South Gate (signalized)
6. Overlook Ave SW at Chesapeake St SW (signalized)

The field data sheets for each intersection and peak period are provided in Attachment A. A determination of the AM and PM peak hours was made based on these peak-period counts. Turning movement counts were analyzed to determine the four highest consecutive 15-minute volumes (the peak hour) during each peak period. The peak hours were determined to be:

- AM Peak Hour: 7:00-8:00 AM
- PM Peak Hour: 4:15-5:15 PM

ADT volumes for roadway links were derived from DC Department of Transportation (DDOT) 2007 traffic volumes adjusted for 2009 using an annual growth rate of +2%. The ADT of a roadway is the typical daily traffic volume in both directions. The 2007 DDOT ADT volumes are shown in Figure 7.

Figure 7. DDOT Traffic Volume Map (2007)



Threshold capacity for link ADT volumes is based upon the following DDOT guidelines:

<u>Facility Type</u>	<u>Lanes</u>	<u>Threshold Capacity in ADT</u>
Minor Collector	2	10,000
Major Collector/Minor Arterial	4	20,000
Major Arterial	4	30,000
Major Arterial	6	45,000

3.3 Traffic Capacity Analysis

Using the existing traffic volumes as determined by the counts, the six study intersections were analyzed using the procedures set forth in the Highway Capacity Manual (HCM), Transportation Research Board, Updated 2000. The Highway Capacity Software (HCS) program was used to determine traffic operational levels of service (LOS). Existing traffic signal timings were used for all analyses.

LOS is a measurement of traffic flow in terms of speed and travel time, freedom to maneuver, comfort, and convenience. There are six LOS, designated by the letters A through F, with LOS A representing the best operating conditions and LOS F the worst. LOS for intersections are measured in terms of vehicle delay, with somewhat different values for signalized intersections and un-signalized intersections, as shown in Table 1.

Table 1
 LOS Values for Signalized and Un-signalized Intersections

Signalized Intersections		Un-signalized Intersections	
Level of Service (LOS)	Vehicle Delay (Seconds)	Level of Service (LOS)	Vehicle Delay (Seconds)
A	Less than 10	A	Less than 10
B	>10-20	B	>10-15
C	>20-35	C	>15-25
D	>35-55	D	>25-35
E	>55-80	E	>35-50
F	More than 80	F	More than 50

The LOS for signalized intersections can reflect the average delay for the entire intersection and the delay for individual movements. For un-signalized intersections, the LOS reflects the delay for side street traffic attempting to enter the mainline. All intersections in this analysis are signalized, except Intersection #3 (I-295 off ramp at Malcolm X Ave SE). Additional results provided by the analysis are delay per vehicle in seconds, and volume/capacity (v/c) ratios. The v/c ratio is a comparison between the volume of traffic entering the intersection from one or all approaches and the possible capacity of one or all approaches.

An LOS C or better is the desirable goal for a roadway facility. However, in major urban areas such as Washington, DC, LOS D is considered acceptable. LOS E and F are considered to be at or below capacity and are generally unacceptable. A summary of existing LOS for the 6 study intersections, including delays and v/c ratios, is shown in Table 2. The analysis of existing conditions shows that all intersections in the study area operate at overall LOS C or better.

Table 2
Existing Peak Hour LOS (2009)

Intersection		AM Peak Hour			PM Peak Hour			Remarks
#	Location	v/c ratio	Delay (secs)	LOS	v/c ratio	Delay (secs)	LOS	
1	South Capitol St (Northbound) and Malcolm X Ave	0.30	24.3	C	0.36	11.0	B	Signalized
2	South Capitol St (Southbound) and Malcolm X Ave	0.77	22.1	C	0.77	17.3	B	Signalized
3	I-295 off ramp at Malcolm X Ave SE	-	16.8	C	-	16.8	C	Un-signalized
4	South Capitol St at Firth Sterling Ave	0.54	22.2	C	0.91	33.5	C	Signalized
5	Overlook Ave SW at South Gate	0.35	15.6	B	0.29	13.3	B	Signalized
6	Overlook Ave SW at Chesapeake St SW	0.41	12.4	B	0.39	9.9	A	Signalized

3.4 Public Transportation

The Washington Metropolitan Area Transit Authority (WMATA or Metro) provides access to NSF Anacostia and Bolling AFB via several Metrobus routes and one Metrorail station. The Air Force runs a shuttle service between the Metro station and the Bolling-Anacostia installation.

Metrorail

The nearest Metrorail station is the Anacostia Station, near the intersection of Firth Sterling Avenue and Howard Road, SE, a little more than half a mile from NSF Anacostia's North Gate. Anacostia-Bolling employees commuting by Metro have to walk to the installation via Firth Sterling Avenue. However, there is no continuous pedestrian route with sidewalks along this stretch of Firth Sterling Avenue. Past the intersection with the Suitland Parkway, pedestrians must walk on the side of the road or on grass. On their way to the installation, pedestrians must cross the Suitland Parkway and South Capitol Street. There is no crosswalk across South Capitol Street. There is a crosswalk across the Suitland Parkway, but according to DDOT Traffic Services Administration, this is a high pedestrian accident intersection. Finally, the reputation of the surrounding neighborhood

as a high-crime area further discourages potential pedestrians. Existing shuttle services partly mitigate this situation (see below).

Metrobus

Seven Metrobus lines run along South Capitol Street, with stops near Bolling and Anacostia. Information on these lines is summarized in Table 3.

Table 3
 Metrobus Lines

Line	Between...	And...	Weekday Schedule	Restrictions
P-17	Fort Washington Park, MD	Eye and 17 th Streets, NW, DC	NB: 4:50-8:45 AM SB: 2:57-6:54 PM	NB: Inside the Beltway, alight only SB: Inside beltway, board only.
P-18	Fort Washington Park, MD	Anacostia Metro Station	NB: 9:25 AM-2:30 PM SB 9:39 AM-2:30 PM	
P-19	Fort Washington Park, MD	Eye and 17 th Streets, NW, DC	NB: 5:37-8:30 AM SB: 3:42-6:04 PM	NB: Inside the Beltway, alight only SB: Inside beltway, board only.
W-4	Anacostia Metro Station	Cooper Lane and Annapolis Road, MD	NB: 5:03 AM-1:09 AM SB: 5:09 AM (Deanwood Metro Station)- 2:02 AM (Deanwood Metro Station)	
W-13	Old Fort Road and Indian Head Highway, MD	Eye and 17 th Streets, NW, DC	NB: 4:55-7:49 AM SB: 3:35-6:40 PM	NB: North of the Beltway, alight only SB: North of the Beltway, board only.
W-14	Allentown and Old Fort Roads, MD	Anacostia Metro Station	NB: 8:54 AM-2:59 PM SB: 10:14 AM-3:19 PM	
A-9	Southern Avenue and South Capitol Street, SE, DC	D and 7 th Street, NW, DC	NB: 5:55-8:55 AM SB: 3:13-6:48 PM	

Only Line W-4 provides service throughout the day. Line W-4 serves the Main Gate at South Capitol Street and Malcolm X Avenue, and the North Gate at South Capitol Street and Firth Sterling Avenue. So does Line A-9, but on a much more limited schedule since, like the other lines, it only provides rush-hour service. With the exception of Line W-4, the bus lines that run along South Capitol Street near the project site are primarily designed to move people between downtown Washington and the Maryland suburbs during peak periods. The project site is approximately 1,700 feet from the North Gate; as previously noted,

there is no crosswalk across South Capitol at the North Gate. Along with the limited schedules, these factors are likely to discourage potential bus riders.

Shuttle Services

Existing shuttle service between the Anacostia Station and NSF Anacostia via the North Gate includes a shuttle run by the Air Force between 5:25 and 9:15 in the morning and 3:10 and 6:48 in the evening, with 20-minute headways. The shuttle stops at several places on NSF Anacostia and Bolling AFB. The closest stop to the preferred site is Stop #4, near the intersection of Thomas Road and Brookley Boulevard. The ride between the Metrorail station and Stop #4 takes between 20 and 30 minutes, depending on the direction. The shuttle does not stop within walking distance of the alternative site. The appeal of this shuttle service is diminished by the lack of mid-day service, which may leave employees stranded. The Defense Intelligence Agency (DIA) runs another shuttle, but it is limited to DIA employees. Both shuttles operate under waivers from DoD transportation regulations that prohibit use of government-run transportation between residences and workplaces. A shuttle map and schedule are included in attachment D.

4.0 NO ACTION CONDITIONS (2011)

4.1 Affected Roadway Network

Under No Action conditions, the proposed relocation of NSMA would not occur, with no impacts on the road network near NSF Anacostia and Bolling AFB. Analysis of the No Action Alternative provides the baseline for evaluating the impacts of the action alternatives. The year of analysis is 2011, which is when the new NSMA facility is scheduled to be fully occupied.

4.2 Planned Roadway Improvements and Approved Development Projects

No planned roadway improvements in the vicinity of the project area have been included in the analysis because all known planned and approved projects have completion dates later than 2011.

4.3 Traffic Capacity Analysis

To estimate 2011 no action peak hour LOS, a two-percent-per-year growth rate was assumed and added to the 2009 traffic volumes. A summary of the LOS analysis results, including delays and v/c ratios, is shown in Table 4. The analysis shows that all intersections in the study area are projected to operate at LOS C or better, with the exception of Intersection #4 (South Capitol St. at Firth Sterling Ave.), which would operate at LOS D (from C under existing conditions) during the PM peak hour.

Table 4
 No Action Peak Hour LOS (2011)

Intersection		AM Peak Hour			PM Peak Hour			Remarks
#	Location	v/c ratio	Delay (secs)	LOS	v/c ratio	Delay (secs)	LOS	
1	South Capitol St (Northbound) and Malcolm X Ave	0.32	25.4	C	0.38	11.2	B	Signalized
2	South Capitol St (Southbound) and Malcolm X Ave	0.81	24.0	C	0.81	18.6	B	Signalized
3	I-295 off ramp at Malcolm X Ave SE	-	17.9	C	-	17.9	C	Un-signalized
4	South Capitol St at Firth Sterling Ave	0.58	22.8	C	0.96	37.6	D	Signalized
5	Overlook Ave SW at South Gate	0.37	15.8	B	0.31	13.5	B	Signalized
6	Overlook Ave SW at Chesapeake St SW	0.42	12.6	B	0.41	10.0	A	Signalized

5.0 ANACOSTIA ALTERNATIVE CONDITIONS (2011)

5.1 Trip Generation

The number of vehicle trips generated by NSMA was determined based on the number of employees expected to drive to and from work during the AM and PM peak hours. Under the proposed action, a total of 800 employees would relocate to NSF Anacostia. The expected modal split (percentage of employees using different modes of transportation) was determined based on modal split information provided in the December 2004 *Anacostia Annex Site Development Plan* (Section 3.6). The number of vehicle trips to the site on a typical workday was calculated based on the modal split. Results are shown in Table 5.

Table 5
Modal Split

Mode of travel	Modal Split ¹	Employees ²	Vehicle Trips (one-way)
Driving Alone	73%	584	584
Car pooling	16%	128	51
Van pooling	6%	48	10
Transit, pedestrian, bicycle	5%	40	0
Total	100%	800	645

1. Source: Anacostia Annex Site Development Plan, December 2004
2. Based on an average of 2.5 passengers in each car pool and 5 passengers in each van pool.

A total of 645 vehicle trips is expected to be generated by the site every AM and PM. Hourly arrival rates and departure rates of employees were determined by analyzing gate traffic counts conducted on November 18, 2008. Based on these counts, 44% of the trips (284 vehicles) are expected to arrive during the AM peak hour and 42% (271 vehicles) would depart during the PM peak hour. The percentage of vehicle entering or exiting each gate during the peak hours was also calculated based on the November 18 counts. The number of visitors/deliveries during the AM and PM peak hours was assumed to be 14 vehicles.

5.2 Traffic Distribution

The distribution of the project-generated vehicular traffic on the roadways providing access to and from the proposed project site is a key element in determining traffic impacts on the surrounding intersections.

For this analysis, the following residential location data were provided by the Navy: 70% of the existing NSMA employees reside in Virginia, 29% in Maryland and 1% in another jurisdiction, assumed to be Washington DC for the purposes of this analysis. However, distributing vehicle trips over the road network requires finer-grained data (generally, employees' residential zip codes), which were not made available for this study. Therefore, reasonable assumptions had to be made with regard to the residential location of NSMA employees. To this end, the residential distribution of DoD employees relocating from Arlington County to Fort Belvoir, Virginia, as presented in the *Final Environmental Impact Statement for BRAC Implementation and Related Army Actions* (June 2007), was used as a stand-in (with minor adjustments) for the residential distribution of NSMA employees, also DoD employees located in Arlington County.

On this basis, it was estimated that 40% of the NSMA employees would enter the study area from southbound South Capitol Street, 32% would enter from southbound I-295, 26% from northbound I-295, and 2% from

westbound Suitland Parkway. Distributing these traffic volumes on the local network, 62% of the traffic is expected to use the North Gate; 26% is expected use the Main Gate; and 12% is expected to use the South Gate. The assignment of project-generated peak hour traffic was based upon these assumed traffic distribution percentages.

5.3 Peak Hour Trip Generation

Trips occurring during peak hours as a result of the project are shown in Table 6. Approximately 241 vehicles would enter and 57 vehicles would exit the site during the AM peak hour. During the PM peak hour, approximately 49 vehicles would enter and 236 vehicles would exit the site.

Table 6
 Peak Hour Trip Generation - Anacostia Alternative

	AM Peak Hour				PM Peak Hour			
	No. of Trips	% Enter/Exit	No. of Trips		No. of Trips	% Enter/Exit	No. of Trips	
			Enter	Exit			Enter	Exit
North Gate	185	78/22	144	41	177	18/82	32	145
Main Gate	77	86/14	66	11	74	16/84	12	62
South Gate	36	85/15	31	5	34	15/85	5	29
Total NSMA	298	81/19	241	57	285	17/83	49	236

5.4 Traffic Capacity Analysis

Using estimated 2011 traffic volumes, the six study intersections were analyzed using the HCS program to determine LOS for future conditions under the Anacostia Alternative. Existing traffic signal timings were used to allow for a direct comparison with the no action and the existing condition scenarios. However, future signal timing modifications might improve delays. Table 7 shows the projected 2011 LOS under the Anacostia Alternative. The analysis shows that, under this alternative, LOS would be very similar to existing and no action LOS, with slightly increased delays. All study intersections would operate at an overall LOS C or better, with the exception of Intersection #4 (South Capitol St. at Firth Sterling Ave.), which would operate at LOS D during the PM peak period, as it would under no action conditions.

Table 7
Anacostia Alternative Peak Hour LOS (2011)

Intersection		AM Peak Hour			PM Peak Hour			Remarks
#	Location	v/c ratio	Delay (secs)	LOS	v/c ratio	Delay (secs)	LOS	
1	South Capitol St (Northbound) and Malcolm X Ave	0.34	27.4	C	0.38	11.2	B	Signalized
2	South Capitol St (Southbound) and Malcolm X Ave	0.84	27.9	C	0.86	19.9	B	Signalized
3	I-295 off ramp at Malcolm X Ave SE	-	20.1	C	-	17.2	C	Un-signalized
4	South Capitol St at Firth Sterling Ave	0.70	26.7	C	1.06	44.6	D	Signalized
5	Overlook Ave SW at South Gate	0.37	15.8	B	0.32	13.4	B	Signalized
6	Overlook Ave SW at Chesapeake St SW	0.42	12.5	B	0.41	9.8	A	Signalized

6.0 BELLEVUE ALTERNATIVE CONDITIONS (2011)

6.1 Trip Generation

The number of vehicle trips generated by NSMA is the same under this alternative as it would be under the Anacostia Alternative.

6.2 Traffic Distribution

The distribution of the generated vehicular traffic on the roadways providing access to the Bolling-Anacostia installation would change under this alternative.

Using the same methodology as was used for the Anacostia Alternative conditions analysis, it was estimated that 86% of the NSMA employees would enter the study area via northbound I-295, 9% would enter it via southbound I-295, and 5% would enter it via South Capitol Street. Distributing these traffic volumes on the local network, 75% of the traffic is projected to use the South Gate; 20% is expected to use the Main Gate; and 5% is expected to use the North Gate. The assignment of project-generated peak hour traffic was based on these projected traffic distribution percentages.

6.3 Peak Hour Trip Generation

Trips projected to occur during the AM and PM peak hours under the Bellevue Alternative are shown in Table 8. The total traffic would remain the same as under the Anacostia Alternative, but the gate volumes and the local network traffic volumes would change.

Table 8
 Peak Hour Trip Generation - Bellevue Alternative

	AM Peak Hour				PM Peak Hour			
	No. of Trips	% Enter/Exit	No. of Trips		No. of Trips	% Enter/Exit	No. of Trips	
			Enter	Exit			Enter	Exit
North Gate	14	78/22	11	3	14	18/82	3	11
Main Gate	60	86/14	52	8	57	16/84	9	48
South Gate	224	85/15	178	46	214	15/85	37	177
Total NSMA	298	81/19	241	57	285	17/83	49	236

6.4 Traffic Capacity Analysis

Using the estimated 2011 traffic volumes, the six study intersections were analyzed to determine LOS under the Bellevue alternative. Table 9 shows the results of the analysis. LOS under the Bellevue Alternative would be very similar to those under the Anacostia Alternative. All study intersections would operate at overall LOS C or better, with the exception of Intersection #4 (South Capitol St. at Firth Sterling Ave.), which would operate at LOS D during the PM peak period, as it would under no action conditions.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Traffic Impacts

Based on the analyses summarized above, the relocation of NSMA under either of the alternatives considered is not expected to significantly degrade intersection LOS in the study area. Intersection delays and v/c ratios would increase marginally. The intersection of South Capitol Street and Firth Sterling Avenue would continue to operate at LOS D during the PM peak hour, as it is expected to do under no action conditions. LOS D is acceptable in major urban areas such as Washington, DC. All the other study intersections would experience small increases in traffic volumes, but they would continue to operate at LOS C or better. Therefore, the proposed action is not expected to have a significant adverse impact on traffic conditions in the study area.

Table 9
Bellevue Alternative Peak Hour LOS (2011)

Intersection		AM Peak Hour			PM Peak Hour			Remarks
#	Location	v/c ratio	Delay (secs)	LOS	v/c ratio	Delay (secs)	LOS	
1	South Capitol St (Northbound) and Malcolm X Ave	0.33	27.1	C	0.38	11.2	B	Signalized
2	South Capitol St (Southbound) and Malcolm X Ave	0.84	26.3	C	0.84	19.3	B	Signalized
3	I-295 off ramp at Malcolm X Ave SE	-	19.1	C	-	17.3	C	Un-signalized
4	South Capitol St at Firth Sterling Ave	0.59	23.0	C	0.97	38.0	D	Signalized
5	Overlook Ave SW at South Gate	0.43	16.8	B	0.39	13.0	B	Signalized
6	Overlook Ave SW at Chesapeake St SW	0.53	12.7	B	0.52	9.9	A	Signalized

7.2 Recommendations

The roadways and intersections of the study area would continue to operate under capacity after the proposed relocation of NSMA has taken place. No roadway improvements or other mitigation measures are recommended.

8.0 REFERENCES

1. Functional Classification Map - District Department of Transportation (DDOT),
2. 2007 Traffic Volumes - District Department of Transportation (DDOT), Traffic Services Administration, Washington, D.C.
3. National Research Council 2000. HCM2000 - Highway Capacity Manual, Transportation Research Board, Washington, D.C.
4. Federal Highway Administration. 2004 MUTCD - Manual on Uniform Traffic Control Devices, 2003 Edition, Rev. July 21, 2004
5. D.C. Department of Transportation (DDOT) 2005 - Design and Engineering Manual, Chapter 45.

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Attachment A
Turning Movement Counts

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File Name : #1 - S. Capitol St. SB and Malcolm X AM
Site Code : 00003011
Start Date : 3/17/2009
Page No : 1

SB Rights were continuously backed up for entire AM study.

Groups Printed- Vehicles

Start Time	S. Capitol St. SB Southbound					Malcolm X Westbound					Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	157	14	44	0	215	0	139	14	0	153	0	0	0	0	0	14	42	0	0	56	
06:45 AM	170	8	53	0	231	0	151	7	0	158	0	0	0	0	0	7	50	0	0	57	
Total	327	22	97	0	446	0	290	21	0	311	0	0	0	0	0	21	92	0	0	113	
07:00 AM	174	14	42	0	230	0	206	17	0	223	0	0	0	0	0	17	48	0	0	65	
07:15 AM	160	8	59	0	227	0	179	29	0	208	0	0	0	0	0	17	52	0	0	69	
07:30 AM	175	8	59	0	242	0	169	14	0	183	0	0	0	0	0	15	42	0	0	57	
07:45 AM	161	12	83	0	256	0	192	22	0	214	0	0	0	0	0	8	36	0	0	44	
Total	670	42	243	0	955	0	746	82	0	828	0	0	0	0	0	57	178	0	0	235	
08:00 AM	122	7	91	0	220	0	117	17	0	134	0	0	0	0	0	12	40	0	0	52	
08:15 AM	92	7	64	0	163	0	101	19	0	120	0	0	0	0	0	12	40	0	0	52	
Grand Total	1211	78	495	0	1784	0	1254	139	0	1393	0	0	0	0	0	102	350	0	0	452	
Apprch %	67.9	4.4	27.7	0.0		0.0	90.0	10.0	0.0		0.0	0.0	0.0	0.0		22.6	77.4	0.0	0.0		
Total %	33.4	2.1	13.6	0.0	49.2	0.0	34.6	3.8	0.0	38.4	0.0	0.0	0.0	0.0	0.0	2.8	9.6	0.0	0.0	12.5	

Start Time	S. Capitol St. SB Southbound					Malcolm X Westbound					Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	670	42	243	0	955	0	746	82	0	828	0	0	0	0	0	57	178	0	0	235	2018
Percent	70.2	4.4	25.4	0.0		0.0	90.1	9.9	0.0		0.0	0.0	0.0	0.0		24.3	75.7	0.0	0.0		0.974
07:00 Volume	174	14	42	0	230	0	206	17	0	223	0	0	0	0	0	17	48	0	0	65	518
Peak Factor																					
High Int.	07:45 AM					07:00 AM					6:15:00 AM					07:15 AM					
Volume	161	12	83	0	256	0	206	17	0	223	0	0	0	0	0	17	52	0	0	69	
Peak Factor	0.933															0.851					

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File Name : #1 - S. Capitol St. SB and Malcolm X PM
Site Code : 00003011
Start Date : 3/18/2009
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Groups Printed- Vehicles

Start Time	S. Capitol St. SB Southbound					Malcolm X Westbound					Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	43	7	99	0	149	0	14	21	0	35	0	0	0	0	0	144	159	0	0	303	487
03:45 PM	45	8	105	0	158	0	7	24	0	31	0	0	0	0	0	145	189	0	0	334	523
Total	88	15	204	0	307	0	21	45	0	66	0	0	0	0	0	289	348	0	0	637	1010
04:00 PM	53	19	95	0	167	0	19	20	0	39	0	0	0	0	0	183	188	0	0	371	577
04:15 PM	56	9	111	0	176	0	16	25	0	41	0	0	0	0	0	209	173	0	0	382	599
04:30 PM	60	16	96	0	172	0	13	25	0	38	0	0	0	0	0	184	190	0	0	374	584
04:45 PM	59	8	115	0	182	0	16	17	0	33	0	0	0	0	0	150	143	0	0	293	508
Total	228	52	417	0	697	0	64	87	0	151	0	0	0	0	0	726	694	0	0	1420	2268
05:00 PM	51	13	122	0	186	0	18	23	0	41	0	0	0	0	0	148	139	0	0	287	514
05:15 PM	54	13	119	0	186	0	27	22	0	49	0	0	0	0	0	130	141	0	0	271	506
Grand Total	421	93	862	0	1376	0	130	177	0	307	0	0	0	0	0	1293	1322	0	0	2615	4298
Apprch %	30.6	6.8	62.6	0.0		0.0	42.3	57.7	0.0		0.0	0.0	0.0	0.0		49.4	50.6	0.0	0.0		
Total %	9.8	2.2	20.1	0.0	32.0	0.0	3.0	4.1	0.0	7.1	0.0	0.0	0.0	0.0		30.1	30.8	0.0	0.0	60.8	

Start Time	S. Capitol St. SB Southbound					Malcolm X Westbound					Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	03:45 PM																				
Volume	214	52	407	0	673	0	55	94	0	149	0	0	0	0	0	721	740	0	0	1461	2283
Percent	31.8	7.7	60.5	0.0		0.0	36.9	63.1	0.0		0.0	0.0	0.0	0.0		49.3	50.7	0.0	0.0		
04:15 Volume	56	9	111	0	176	0	16	25	0	41	0	0	0	0	0	209	173	0	0	382	599
Peak Factor																					0.953
High Int.	04:15 PM					04:15 PM					3:15:00 PM					04:15 PM					
Volume	56	9	111	0	176	0	16	25	0	41	0	0	0	0	0	209	173	0	0	382	
Peak Factor	0.956					0.909										0.956					

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File Name : #2 - S. Capitol St. NB and Malcolm X AM
Site Code : 00003000
Start Date : 3/17/2009
Page No : 1

Groups Printed- Vehicles

Start Time	Southbound					Malcolm X Westbound					S. Capitol St. NB Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	0	0	0	0	0	35	166	0	0	201	0	1	14	0	15	0	71	14	0	85	301
06:45 AM	0	0	0	0	0	40	180	0	0	220	2	1	14	0	17	0	86	16	0	102	339
Total	0	0	0	0	0	75	346	0	0	421	2	2	28	0	32	0	157	30	0	187	640
07:00 AM	0	0	0	0	0	49	179	0	0	228	0	2	14	0	16	0	75	15	0	90	334
07:15 AM	0	0	0	0	0	38	210	0	0	248	1	1	21	0	23	0	86	24	0	110	381
07:30 AM	0	0	0	0	0	45	170	0	0	215	2	2	20	0	24	0	89	11	0	100	339
07:45 AM	0	0	0	0	0	49	158	0	0	207	0	1	13	0	14	0	106	12	0	118	339
Total	0	0	0	0	0	181	717	0	0	898	3	6	68	0	77	0	356	62	0	418	1393
08:00 AM	0	0	0	0	0	70	117	0	0	187	1	1	19	0	21	0	118	13	0	131	339
08:15 AM	0	0	0	0	0	66	92	0	0	158	0	1	11	0	12	0	92	12	0	104	274
Grand Total	0	0	0	0	0	392	1272	0	0	1664	6	10	126	0	142	0	723	117	0	840	2646
Apprch %	0.0	0.0	0.0	0.0		23.6	76.4	0.0	0.0		4.2	7.0	88.7	0.0		0.0	86.1	13.9	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	14.8	48.1	0.0	0.0	62.9	0.2	0.4	4.8	0.0	5.4	0.0	27.3	4.4	0.0	31.7	

Start Time	Southbound					Malcolm X Westbound					S. Capitol St. NB Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	0	0	0	0	0	202	655	0	0	857	4	5	73	0	82	0	399	60	0	459	1398
Percent	0.0	0.0	0.0	0.0		23.6	76.4	0.0	0.0		4.9	6.1	89.0	0.0		0.0	86.9	13.1	0.0		
07:15 Volume	0	0	0	0	0	38	210	0	0	248	1	1	21	0	23	0	86	24	0	110	381
Peak Factor																					
High Int.	6:15:00 AM																				
Volume	0	0	0	0	0	38	210	0	0	248	2	2	20	0	24	0	118	13	0	131	0.917
Peak Factor						0.864					0.854					0.876					

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File Name : #2 - S. Capitol St. NB and Malcolm X PM

Site Code : 00003000

Start Date : 3/18/2009

Page No : 1

Groups Printed- Vehicles

Start Time	Southbound					Malcolm X Westbound					S. Capitol St. NB Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	0	0	0	0	0	25	33	0	0	58	5	1	3	0	9	0	233	22	0	255	322
03:45 PM	0	0	0	0	0	34	30	0	0	64	2	0	0	0	2	0	271	29	0	300	366
Total	0	0	0	0	0	59	63	0	0	122	7	1	3	0	11	0	504	51	0	555	688
04:00 PM	0	0	0	0	0	23	34	0	0	57	5	0	2	0	7	0	255	28	0	283	347
04:15 PM	0	0	0	0	0	15	39	0	0	54	1	0	2	0	3	0	252	29	0	281	338
04:30 PM	0	0	0	0	0	21	36	0	0	57	1	0	2	0	3	0	255	32	0	287	347
04:45 PM	0	0	0	0	0	23	30	0	0	53	3	0	3	0	6	0	244	14	0	258	317
Total	0	0	0	0	0	82	139	0	0	221	10	0	9	0	19	0	1006	103	0	1109	1349
05:00 PM	0	0	0	0	0	15	39	0	0	54	2	0	0	0	2	0	236	25	0	261	317
05:15 PM	0	0	0	0	0	17	45	0	0	62	1	2	6	0	9	0	237	23	0	260	331
Grand Total	0	0	0	0	0	173	286	0	0	459	20	3	18	0	41	0	1983	202	0	2185	2685
Apprch %	0.0	0.0	0.0	0.0		37.7	62.3	0.0	0.0		48.8	7.3	43.9	0.0		0.0	90.8	9.2	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	6.4	10.7	0.0	0.0	17.1	0.7	0.1	0.7	0.0	1.5	0.0	73.9	7.5	0.0	81.4	

Start Time	Southbound					Malcolm X Westbound					S. Capitol St. NB Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	03:45 PM																				
Volume	0	0	0	0	0	93	139	0	0	232	9	0	6	0	15	0	1033	118	0	1151	1398
Percent	0.0	0.0	0.0	0.0		40.1	59.9	0.0	0.0		60.0	0.0	40.0	0.0		0.0	89.7	10.3	0.0		
03:45 Volume	0	0	0	0	0	34	30	0	0	64	2	0	0	0	2	0	271	29	0	300	366
Peak Factor																					
High Int.	3:15:00 PM																				
Volume	0	0	0	0	0	34	30	0	0	64	5	0	2	0	7	0	271	29	0	300	366
Peak Factor																					
										0.906											0.959

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File Name : #3 - I-295 NB Ramp and Malcom X AM
Site Code : 00005819
Start Date : 3/17/2009
Page No : 1

Groups Printed- Vehicles

Start Time	I-295 NB Off Ramp Southbound					Malcolm X Westbound					I-295 NB On Ramp Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	141	0	6	0	147	0	61	0	0	61	0	0	0	0	0	0	45	0	0	45	253
06:45 AM	150	1	13	0	164	0	72	0	0	72	0	0	0	0	0	0	54	0	0	54	290
Total	291	1	19	0	311	0	133	0	0	133	0	0	0	0	0	0	99	0	0	99	543
07:00 AM	148	1	12	0	161	0	79	0	0	79	0	0	0	0	0	0	48	0	0	48	288
07:15 AM	158	0	8	0	166	0	94	0	0	94	0	0	0	0	0	0	52	0	0	52	312
07:30 AM	132	0	12	0	144	0	83	0	0	83	0	0	0	0	0	0	54	0	0	54	281
07:45 AM	133	0	20	0	153	0	75	0	0	75	0	0	0	0	0	0	75	0	0	75	303
Total	571	1	52	0	624	0	331	0	0	331	0	0	0	0	0	0	229	0	0	229	1184
08:00 AM	104	0	17	0	121	0	83	0	0	83	0	0	0	0	0	0	97	0	0	97	301
08:15 AM	91	0	10	0	101	0	67	0	0	67	0	0	0	0	0	0	70	0	0	70	238
Grand Total	1057	2	98	0	1157	0	614	0	0	614	0	0	0	0	0	0	495	0	0	495	2266
Apprch %	91.4	0.2	8.5	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	46.6	0.1	4.3	0.0	51.1	0.0	27.1	0.0	0.0	27.1	0.0	0.0	0.0	0.0	0.0	0.0	21.8	0.0	0.0	21.8	

Start Time	I-295 NB Off Ramp Southbound					Malcolm X Westbound					I-295 NB On Ramp Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection 07:15 AM																					
Volume	527	0	57	0	584	0	335	0	0	335	0	0	0	0	0	0	278	0	0	278	1197
Percent	90.2	0.0	9.8	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
07:15 Volume	158	0	8	0	166	0	94	0	0	94	0	0	0	0	0	0	52	0	0	52	312
Peak Factor																					
High Int. 07:15 AM						07:15 AM					6:15:00 AM					08:00 AM					
Volume	158	0	8	0	166	0	94	0	0	94	0	0	0	0	0	0	97	0	0	97	0.959
Peak Factor	0.880					0.891										0.716					

Peggy Malone & Associates, Inc.
(888) 247-8602

File Name : #3 - I-295 NB Ramp and Malcom X PM
Site Code : 00005819
Start Date : 3/18/2009
Page No : 1

Groups Printed- Vehicles

Start Time	I-295 NB Off Ramp Southbound					Malcolm X Westbound					I-295 NB On Ramp Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	15	0	11	0	26	0	49	0	0	49	0	0	0	0	0	0	116	0	0	116	191
03:45 PM	11	0	17	0	28	0	50	0	0	50	0	0	0	0	0	0	131	0	0	131	209
Total	26	0	28	0	54	0	99	0	0	99	0	0	0	0	0	0	247	0	0	247	400
04:00 PM	10	0	18	0	28	0	44	0	0	44	0	0	0	0	0	0	116	0	0	116	188
04:15 PM	12	0	11	0	23	0	39	0	0	39	0	0	0	0	0	0	126	0	0	126	188
04:30 PM	12	0	19	0	31	0	37	0	0	37	0	0	0	0	0	0	124	0	0	124	192
04:45 PM	14	0	9	0	23	0	41	0	0	41	0	0	0	0	0	0	130	0	0	130	194
Total	48	0	57	0	105	0	161	0	0	161	0	0	0	0	0	0	496	0	0	496	762
05:00 PM	13	0	20	0	33	0	36	0	0	36	0	0	0	0	0	0	152	0	0	152	221
05:15 PM	20	0	20	0	40	0	44	0	0	44	0	0	0	0	0	0	128	0	0	128	212
Grand Total	107	0	125	0	232	0	340	0	0	340	0	0	0	0	0	0	1023	0	0	1023	1595
Apprch %	46.1	0.0	53.9	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	6.7	0.0	7.8	0.0	14.5	0.0	21.3	0.0	0.0	21.3	0.0	0.0	0.0	0.0	0.0	0.0	64.1	0.0	0.0	64.1	

Start Time	I-295 NB Off Ramp Southbound					Malcolm X Westbound					I-295 NB On Ramp Northbound					Malcolm X Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	59	0	68	0	127	0	158	0	0	158	0	0	0	0	0	0	534	0	0	534	819
Percent	46.5	0.0	53.5	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
05:00 Volume	13	0	20	0	33	0	36	0	0	36	0	0	0	0	0	0	152	0	0	152	221
Peak Factor																					0.926
High Int.	05:15 PM					05:15 PM					3:15:00 PM					05:00 PM					
Volume	20	0	20	0	40	0	44	0	0	44	0	0	0	0	0	0	152	0	0	152	
Peak Factor	0.794					0.898										0.878					

Peggy Malone & Associates, Inc.

(888) 247-8602

File Name : #4 - S. Capitol St. and Defense Blvd_Firth Sterling AM

Site Code : 00003005

Start Date : 3/17/2009

Page No : 1

Groups Printed- Vehicles

Start Time	S. Capitol St. Southbound					Firth Sterling Westbound					S. Capitol St. Northbound					Defense Blvd. Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	71	62	0	0	133	1	88	38	0	127	15	192	5	0	212	0	21	19	0	40	512
06:45 AM	53	65	0	0	118	3	103	32	0	138	24	186	15	0	225	4	16	22	0	42	523
Total	124	127	0	0	251	4	191	70	0	265	39	378	20	0	437	4	37	41	0	82	1035
07:00 AM	60	76	0	0	136	2	122	30	0	154	18	219	6	0	243	7	21	18	0	46	579
07:15 AM	79	83	0	0	162	1	79	26	0	106	16	247	9	0	272	3	18	29	0	50	590
07:30 AM	53	89	0	0	142	3	98	34	0	135	10	233	25	0	268	1	15	17	0	33	578
07:45 AM	49	87	0	0	136	1	65	33	0	99	9	254	9	0	272	4	28	28	0	60	567
Total	241	335	0	0	576	7	364	123	0	494	53	953	49	0	1055	15	82	92	0	189	2314
08:00 AM	33	75	0	0	108	4	60	42	0	106	11	230	15	0	256	11	11	16	0	38	508
08:15 AM	26	91	0	0	117	3	35	22	0	60	14	241	8	0	263	6	15	25	0	46	486
Grand Total	424	628	0	0	1052	18	650	257	0	925	117	1802	92	0	2011	36	145	174	0	355	4343
Apprch %	40.3	59.7	0.0	0.0		1.9	70.3	27.8	0.0		5.8	89.6	4.6	0.0		10.1	40.8	49.0	0.0		
Total %	9.8	14.5	0.0	0.0	24.2	0.4	15.0	5.9	0.0	21.3	2.7	41.5	2.1	0.0	46.3	0.8	3.3	4.0	0.0	8.2	

Start Time	S. Capitol St. Southbound					Firth Sterling Westbound					S. Capitol St. Northbound					Defense Blvd. Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	241	335	0	0	576	7	364	123	0	494	53	953	49	0	1055	15	82	92	0	189	2314
Percent	41.8	58.2	0.0	0.0		1.4	73.7	24.9	0.0		5.0	90.3	4.6	0.0		7.9	43.4	48.7	0.0		
07:15 Volume	79	83	0	0	162	1	79	26	0	106	16	247	9	0	272	3	18	29	0	50	590
Peak Factor																					
High Int.	07:15 AM					07:00 AM					07:15 AM					07:45 AM					
Volume	79	83	0	0	162	2	122	30	0	154	16	247	9	0	272	4	28	28	0	60	567
Peak Factor	0.889					0.802					0.970					0.788					0.981

Peggy Malone & Associates, Inc.

(888) 247-8602

File Name : #4 - S. Capitol St. and Defense Blvd_Firth Sterling PM

Site Code : 00003005

Start Date : 3/17/2009

Page No : 1

Groups Printed- Vehicles

Start Time	S. Capitol St. Southbound					Firth Sterling Westbound					S. Capitol St. Northbound					Defense Blvd. Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	9	173	3	0	185	2	11	40	0	53	19	90	1	0	110	56	72	42	0	170	518
03:45 PM	31	166	5	0	202	2	12	47	0	61	16	64	0	0	80	35	64	52	0	151	494
Total	40	339	8	0	387	4	23	87	0	114	35	154	1	0	190	91	136	94	0	321	1012
04:00 PM	18	250	4	0	272	2	11	45	0	58	14	66	0	0	80	44	81	57	0	182	592
04:15 PM	22	171	7	0	200	4	15	56	0	75	11	63	2	0	76	46	111	68	0	225	576
04:30 PM	24	280	4	0	308	2	16	60	0	78	30	73	1	0	104	54	87	58	0	199	689
04:45 PM	12	244	3	0	259	6	24	90	0	120	21	66	1	0	88	40	60	34	0	134	601
Total	76	945	18	0	1039	14	66	251	0	331	76	268	4	0	348	184	339	217	0	740	2458
05:00 PM	22	264	7	0	293	8	13	81	0	102	19	65	1	0	85	28	59	32	0	119	599
05:15 PM	14	253	7	0	274	3	21	85	0	109	19	64	0	0	83	34	48	25	0	107	573
Grand Total	152	1801	40	0	1993	29	123	504	0	656	149	551	6	0	706	337	582	368	0	1287	4642
Apprch %	7.6	90.4	2.0	0.0		4.4	18.8	76.8	0.0		21.1	78.0	0.8	0.0		26.2	45.2	28.6	0.0		
Total %	3.3	38.8	0.9	0.0	42.9	0.6	2.6	10.9	0.0	14.1	3.2	11.9	0.1	0.0	15.2	7.3	12.5	7.9	0.0	27.7	

Start Time	S. Capitol St. Southbound					Firth Sterling Westbound					S. Capitol St. Northbound					Defense Blvd. Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	80	959	21	0	1060	20	68	287	0	375	81	267	5	0	353	168	317	192	0	677	2465
Percent	7.5	90.5	2.0	0.0		5.3	18.1	76.5	0.0		22.9	75.6	1.4	0.0		24.8	46.8	28.4	0.0		
04:30 Volume	24	280	4	0	308	2	16	60	0	78	30	73	1	0	104	54	87	58	0	199	689
Peak Factor																					0.894
High Int.	04:30 PM					04:45 PM					04:30 PM					04:15 PM					
Volume	24	280	4	0	308	6	24	90	0	120	30	73	1	0	104	46	111	68	0	225	
Peak Factor	0.860					0.781					0.849					0.752					

Peggy Malone & Associates, Inc.
(888) 247-8602

File Name : #5 - Overlook Ave. and South Gate AM
Site Code : 00002960
Start Date : 3/18/2009
Page No : 1

Groups Printed- Vehicles

Start Time	Overlook Ave. (1 Way) Southbound					Westbound					Overlook Ave. Northbound					South Gate Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	U-turns	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	20	85	0	0	105	0	0	0	0	0	0	167	0	0	167	11	0	0	0	11	283
06:45 AM	42	90	0	0	132	0	0	0	0	0	0	137	0	0	137	20	0	0	0	20	289
Total	62	175	0	0	237	0	0	0	0	0	0	304	0	0	304	31	0	0	0	31	572
07:00 AM	13	95	0	0	108	0	0	0	0	0	0	173	0	0	173	20	0	0	0	20	301
07:15 AM	38	97	0	0	135	0	0	0	0	0	0	169	0	0	169	23	0	0	0	23	327
07:30 AM	24	92	0	0	116	0	0	0	0	0	0	169	0	0	169	13	0	0	0	13	298
07:45 AM	17	75	0	0	92	0	0	0	0	0	0	168	2	0	170	13	0	0	0	13	275
Total	92	359	0	0	451	0	0	0	0	0	0	679	2	0	681	69	0	0	0	69	1201
08:00 AM	20	53	0	0	73	0	0	0	0	0	0	156	1	0	157	18	0	0	0	18	248
08:15 AM	20	80	0	0	100	0	0	0	0	0	0	114	1	0	115	18	0	0	0	18	233
Grand Total	194	667	0	0	861	0	0	0	0	0	0	1253	4	0	1257	136	0	0	0	136	2254
Apprch %	22.5	77.5	0.0	0.0		0.0	0.0	0.0	0.0		0.0	99.7	0.3	0.0		100.0	0.0	0.0	0.0		
Total %	8.6	29.6	0.0	0.0	38.2	0.0	0.0	0.0	0.0	0.0	0.0	55.6	0.2	0.0	55.8	6.0	0.0	0.0	0.0	6.0	

Start Time	Overlook Ave. (1 Way) Southbound					Westbound					Overlook Ave. Northbound					South Gate Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	U-turns	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection 06:45 AM																					
Volume	117	374	0	0	491	0	0	0	0	0	0	648	0	0	648	76	0	0	0	76	1215
Percent	23.8	76.2	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		
07:15 Volume	38	97	0	0	135	0	0	0	0	0	0	169	0	0	169	23	0	0	0	23	327
Peak Factor																					
High Int. 07:15 AM						6:15:00 AM					07:00 AM					07:15 AM					
Volume	38	97	0	0	135	0	0	0	0	0	0	173	0	0	173	23	0	0	0	23	0.929
Peak Factor	0.909										0.936					0.826					

Peggy Malone & Associates, Inc.
(888) 247-8602

File Name : #5 - Overlook Ave. and South Gate PM
Site Code : 00002960
Start Date : 3/18/2009
Page No : 1

Groups Printed- Vehicles

Start Time	Overlook Ave. (1 Way) Southbound					Westbound					Overlook Ave. Northbound					South Gate Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	U-turns	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	6	44	0	0	50	0	0	0	0	0	0	32	2	0	34	91	0	0	0	91	175
03:45 PM	9	73	0	0	82	0	0	0	0	0	0	27	2	0	29	64	0	0	0	64	175
Total	15	117	0	0	132	0	0	0	0	0	0	59	4	0	63	155	0	0	0	155	350
04:00 PM	9	53	0	0	62	0	0	0	0	0	0	25	4	0	29	99	0	0	0	99	190
04:15 PM	3	79	0	0	82	0	0	0	0	0	0	37	0	0	37	117	0	0	0	117	236
04:30 PM	2	68	0	0	70	0	0	0	0	0	0	29	2	0	31	95	0	0	0	95	196
04:45 PM	1	48	0	0	49	0	0	0	0	0	0	31	0	0	31	102	0	0	0	102	182
Total	15	248	0	0	263	0	0	0	0	0	0	122	6	0	128	413	0	0	0	413	804
05:00 PM	4	67	0	0	71	0	0	0	0	0	0	28	1	0	29	93	0	0	0	93	193
05:15 PM	6	55	0	0	61	0	0	0	0	0	0	23	2	0	25	88	0	0	0	88	174
Grand Total	40	487	0	0	527	0	0	0	0	0	0	232	13	0	245	749	0	0	0	749	1521
Apprch %	7.6	92.4	0.0	0.0		0.0	0.0	0.0	0.0		0.0	94.7	5.3	0.0		100.0	0.0	0.0	0.0		
Total %	2.6	32.0	0.0	0.0	34.6	0.0	0.0	0.0	0.0	0.0	0.0	15.3	0.9	0.0	16.1	49.2	0.0	0.0	0.0	49.2	

Start Time	Overlook Ave. (1 Way) Southbound					Westbound					Overlook Ave. Northbound					South Gate Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	U-turns	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:15 PM																				
Volume	10	262	0	0	272	0	0	0	0	0	0	125	3	0	128	407	0	0	0	407	807
Percent	3.7	96.3	0.0	0.0		0.0	0.0	0.0	0.0		0.0	97.7	2.3	0.0		100.0	0.0	0.0	0.0		
04:15 Volume	3	79	0	0	82	0	0	0	0	0	0	37	0	0	37	117	0	0	0	117	236
Peak Factor																					0.855
High Int.	04:15 PM					3:15:00 PM					04:15 PM					04:15 PM					
Volume	3	79	0	0	82	0	0	0	0	0	0	37	0	0	37	117	0	0	0	117	236
Peak Factor	0.829										0.865					0.870					

Peggy Malone & Associates, Inc.

(888) 247-8602

File Name : #6 - Overlook Ave. and Chesapeake Rd. AM

Site Code : 00003398

Start Date : 3/18/2009

Page No : 1

Southbound backs up to light, cars getting stuck at light before entering intersection.

Groups Printed- Vehicles

Start Time	Overlook Ave. Southbound					Chesapeake Rd. Westbound					Overlook Ave. Northbound					Chesapeake Rd. (Guarded Gate) Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	23	69	9	0	101	36	5	25	0	66	4	119	1	0	124	3	5	6	0	14	305
06:45 AM	17	75	11	0	103	39	7	26	0	72	7	114	0	0	121	4	3	13	0	20	316
Total	40	144	20	0	204	75	12	51	0	138	11	233	1	0	245	7	8	19	0	34	621
07:00 AM	23	74	24	0	121	44	3	22	0	69	5	109	0	0	114	2	10	8	0	20	324
07:15 AM	20	88	29	0	137	44	3	27	0	74	4	115	1	0	120	3	9	6	0	18	349
07:30 AM	20	60	20	0	100	43	5	30	0	78	10	117	1	0	128	2	5	4	0	11	317
07:45 AM	29	56	13	0	98	35	3	18	0	56	7	128	1	0	136	1	4	3	0	8	298
Total	92	278	86	0	456	166	14	97	0	277	26	469	3	0	498	8	28	21	0	57	1288
08:00 AM	32	58	20	0	110	36	8	20	0	64	12	113	4	0	129	1	3	4	0	8	311
08:15 AM	29	62	18	0	109	27	7	21	0	55	6	88	2	0	96	1	10	3	0	14	274
Grand Total	193	542	144	0	879	304	41	189	0	534	55	903	10	0	968	17	49	47	0	113	2494
Apprch %	22.0	61.7	16.4	0.0		56.9	7.7	35.4	0.0		5.7	93.3	1.0	0.0		15.0	43.4	41.6	0.0		
Total %	7.7	21.7	5.8	0.0	35.2	12.2	1.6	7.6	0.0	21.4	2.2	36.2	0.4	0.0	38.8	0.7	2.0	1.9	0.0	4.5	

Start Time	Overlook Ave. Southbound					Chesapeake Rd. Westbound					Overlook Ave. Northbound					Chesapeake Rd. (Guarded Gate) Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																						
Intersection 06:45 AM																						
Volume	80	297	84	0	461	170	18	105	0	293	26	455	2	0	483	11	27	31	0	69	1306	
Percent	17.4	64.4	18.2	0.0		58.0	6.1	35.8	0.0		5.4	94.2	0.4	0.0		15.9	39.1	44.9	0.0			
07:15 Volume	20	88	29	0	137	44	3	27	0	74	4	115	1	0	120	3	9	6	0	18	349	
Peak Factor																					0.936	
High Int. Volume	07:15 AM					07:30 AM					07:30 AM					06:45 AM						
Peak Factor	20	88	29	0	137	43	5	30	0	78	10	117	1	0	128	4	3	13	0	20	0.863	
					0.841					0.939					0.943							

Peggy Malone & Associates, Inc.

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File Name : #6 - Overlook Ave. and Chesapeake Rd. PM

Site Code : 00003398

Start Date : 3/18/2009

Page No : 1

Groups Printed- Vehicles

Start Time	Overlook Ave. Southbound					Chesapeak Rd. Westbound					Overlook Ave. Northbound					Chesapeake Rd. (Guarded Gate) Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	14	82	44	0	140	5	2	13	0	20	12	19	2	0	33	4	16	5	0	25	218
03:45 PM	9	84	42	0	135	2	0	12	0	14	17	26	1	0	44	11	17	1	0	29	222
Total	23	166	86	0	275	7	2	25	0	34	29	45	3	0	77	15	33	6	0	54	440
04:00 PM	18	96	41	0	155	7	2	11	0	20	26	23	1	0	50	8	19	1	0	28	253
04:15 PM	15	128	47	0	190	6	0	9	0	15	19	25	3	0	47	3	18	4	0	25	277
04:30 PM	14	107	45	0	166	2	1	8	0	11	16	27	2	0	45	8	21	4	0	33	255
04:45 PM	12	113	37	0	162	6	0	8	0	14	12	17	3	0	32	5	22	3	0	30	238
Total	59	444	170	0	673	21	3	36	0	60	73	92	9	0	174	24	80	12	0	116	1023
05:00 PM	13	104	35	0	152	5	0	6	0	11	15	23	5	0	43	8	27	2	0	37	243
05:15 PM	6	99	37	0	142	3	0	10	0	13	11	16	9	0	36	7	15	5	0	27	218
Grand Total	101	813	328	0	1242	36	5	77	0	118	128	176	26	0	330	54	155	25	0	234	1924
Apprch %	8.1	65.5	26.4	0.0		30.5	4.2	65.3	0.0		38.8	53.3	7.9	0.0		23.1	66.2	10.7	0.0		
Total %	5.2	42.3	17.0	0.0	64.6	1.9	0.3	4.0	0.0	6.1	6.7	9.1	1.4	0.0	17.2	2.8	8.1	1.3	0.0	12.2	

Start Time	Overlook Ave. Southbound					Chesapeak Rd. Westbound					Overlook Ave. Northbound					Chesapeake Rd. (Guarded Gate) Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:00 PM																				
Volume	59	444	170	0	673	21	3	36	0	60	73	92	9	0	174	24	80	12	0	116	1023
Percent	8.8	66.0	25.3	0.0		35.0	5.0	60.0	0.0		42.0	52.9	5.2	0.0		20.7	69.0	10.3	0.0		
04:15 Volume	15	128	47	0	190	6	0	9	0	15	19	25	3	0	47	3	18	4	0	25	277
Peak Factor																					
High Int.	04:15 PM																				
Volume	15	128	47	0	190	04:00 PM					04:00 PM					04:30 PM					33
Peak Factor	0.886					0.750					0.870					0.879					

Attachment B
Highway Capacity Analysis Printouts

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HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Existing</i>	Analysis Year <i>2009</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N ₁	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	60	399			655	202	73	5	4			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, l ₁	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	65	429			826			86				
Lane Group Capacity, c	120	1197			1170			1816				
v/c Ratio, X	0.54	0.36			0.71			0.05				
Total Green Ratio, g/C	0.34	0.34			0.34			0.54				
Uniform Delay, d ₁	21.5	20.0			23.0			8.8				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	16.2	0.8			3.6			0.0				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	37.7	20.8			26.6			8.8				
Lane Group LOS	D	C			C			A				
Approach Delay	23.0			26.6			8.8					
Approach LOS	C			C			A					
Intersection Delay	24.3			X _c = 0.30			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St SB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Existing</i>	Analysis Year <i>2009</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N ₁		3	1	0	2					1	1	1	
Lane Group		<i>T</i>	<i>R</i>		<i>LT</i>					<i>L</i>	<i>LT</i>	<i>R</i>	
Volume, V (vph)		178	57	82	746					243	42	670	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, l ₁		2.0	2.0		2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0		2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3		3					3	3	3	
Unit Extension, UE		3.0	3.0		3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000		1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0		0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	28	0	0		0	0		0	0	90	
Lane Width		12.0	12.0		12.0					12.0	12.0	12.0	
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0		0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		191	31		890					261	45	624	
Lane Group Capacity, c		1712	534		1063					951	1001	851	
v/c Ratio, X		0.11	0.06		0.84					0.27	0.04	0.73	
Total Green Ratio, g/C		0.34	0.34		0.34					0.54	0.54	0.54	
Uniform Delay, d ₁		18.2	17.9		24.5					10.0	8.8	14.1	
Progression Factor, PF		1.000	1.000		1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.11		0.37					0.11	0.11	0.29	
Incremental Delay, d ₂		0.0	0.0		6.0					0.2	0.0	3.3	
Initial Queue Delay, d ₃		0.0	0.0		0.0					0.0	0.0	0.0	
Control Delay		18.3	18.0		30.5					10.2	8.8	17.4	
Lane Group LOS		<i>B</i>	<i>B</i>		<i>C</i>					<i>B</i>	<i>A</i>	<i>B</i>	
Approach Delay		18.2			30.5						15.0		
Approach LOS		<i>B</i>			<i>C</i>						<i>B</i>		
Intersection Delay		22.1			<i>X_c = 0.77</i>			Intersection LOS			<i>C</i>		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	I-295 NB ramp and Malcolm X Av
Agency/Co.		Jurisdiction	Washington DC
Date Performed	4/17/2009	Analysis Year	2009
Analysis Time Period	AM Existing		

Project Description <i>NSMA Relocation</i>	
East/West Street: <i>Malcolm X Ave</i>	North/South Street: <i>I-295 NB ramp</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		278	95	251	355	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	278	95	251	355	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				57	0	527
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	57	0	527
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		251				57		527
C (m) (veh/h)		1197				194		870
v/c		0.21				0.29		0.61
95% queue length		0.79				1.17		4.20
Control Delay (s/veh)		8.8				31.1		15.3
LOS		<i>A</i>				<i>D</i>		<i>C</i>
Approach Delay (s/veh)	--	--				16.8		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection S Capitol St NB and Firth Ster
Agency or Co.	Area Type All other areas
Date Performed 4/24/2009	Jurisdiction Washington DC
Time Period AM Existing	Analysis Year 2009
	Project ID NSMA Relocation

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R		LTR		L	TR			LTR	
Volume, V (vph)	92	82	15	123	364	7	49	953	53	1	335	241
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.80	0.80	0.80	0.97	0.97	0.97	0.88	0.88	0.88
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3		3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987		1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0		12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0		0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 42.2	G = 0.0	G = 0.0	G = 0.0	G = 67.8	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	118	105	10		614		51	1011			588	
Lane Group Capacity, c	197	655	557		1041		414	1995			1812	
v/c Ratio, X	0.60	0.16	0.02		0.59		0.12	0.51			0.32	
Total Green Ratio, g/C	0.35	0.35	0.35		0.35		0.56	0.56			0.56	
Uniform Delay, d ₁	32.0	26.7	25.4		31.8		12.2	15.9			13.9	
Progression Factor, PF	1.000	1.000	1.000		1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50		0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	12.6	0.5	0.1		2.5		0.6	0.9			0.5	
Initial Queue Delay, d ₃	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Control Delay	44.5	27.2	25.4		34.3		12.8	16.8			14.4	
Lane Group LOS	D	C	C		C		B	B			B	
Approach Delay	35.9			34.3			16.6			14.4		
Approach LOS	D			C			B			B		
Intersection Delay	22.2			X _c = 0.54			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/24/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Existing</i>	Analysis Year
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			76		648						374	117
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.83		0.94						0.91	0.91
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I _l			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	0
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 34.7	G = 0.0	G = 0.0	G = 0.0	G = 35.3	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			92		689						411	129
Lane Group Capacity, c			1216		1539						1565	698
v/c Ratio, X			0.08		0.45						0.26	0.18
Total Green Ratio, g/C			0.43		0.43						0.44	0.44
Uniform Delay, d ₁			13.3		15.9						14.1	13.6
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.1		0.9						0.4	0.6
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			13.4		16.9						14.5	14.2
Lane Group LOS			<i>B</i>		<i>B</i>						<i>B</i>	<i>B</i>
Approach Delay	13.4			16.9						14.4		
Approach LOS	<i>B</i>			<i>B</i>						<i>B</i>		
Intersection Delay	15.6			X _c = 0.35			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and Chesapeake Rd</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/27/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Existing</i>	Analysis Year
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N ₁	0	1	0	0	1	1	1	1	1	1	1	1	
Lane Group		LTR			LT	R	L	T	R	L	T	R	
Volume, V (vph)	31	27	11	105	18	170	2	455	26	84	297	80	
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2	
Peak-Hour Factor, PHF	0.86	0.86	0.86	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up Lost Time, I ₁		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type, AT		3			3	3	3	3	3	3	3	3	
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	5	0	0	60	0	0	13	0	0	40	
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08					
Timing	G = 17.0	G = 0.0	G = 0.0	G = 0.0	G = 53.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		74			131	117	2	484	14	100	354	48	
Lane Group Capacity, c		309			283	336	657	1234	1049	545	1234	1049	
v/c Ratio, X		0.24			0.46	0.35	0.00	0.39	0.01	0.18	0.29	0.05	
Total Green Ratio, g/C		0.21			0.21	0.21	0.66	0.66	0.66	0.66	0.66	0.66	
Uniform Delay, d ₁		26.1			27.5	26.8	4.6	6.2	4.6	5.2	5.6	4.7	
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Incremental Delay, d ₂		1.8			5.4	2.8	0.0	0.9	0.0	0.7	0.6	0.1	
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay		28.0			32.9	29.6	4.6	7.1	4.6	5.9	6.2	4.8	
Lane Group LOS		C			C	C	A	A	A	A	A	A	
Approach Delay		28.0			31.3			7.0			6.0		
Approach LOS		C			C			A			A		
Intersection Delay		12.4			X _c = 0.41			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Existing</i>	Analysis Year <i>2009</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N ₁	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	118	1033			139	93	6	0	9			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, l ₁	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	128	1111			152			15				
Lane Group Capacity, c	703	2040			2033			957				
v/c Ratio, X	0.18	0.54			0.07			0.02				
Total Green Ratio, g/C	0.57	0.57			0.57			0.30				
Uniform Delay, d ₁	8.1	10.5			7.5			19.7				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	0.6	1.0			0.1			0.0				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	8.6	11.6			7.6			19.7				
Lane Group LOS	A	B			A			B				
Approach Delay	11.3			7.6			19.7					
Approach LOS	B			A			B					
Intersection Delay	11.0			X _c = 0.36			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information				Site Information			
Analyst	NVD			Intersection	S Capitol St SB and Malcolm X		
Agency or Co.				Area Type	All other areas		
Date Performed	4/14/2009			Jurisdiction	Washington DC		
Time Period	PM Existing			Analysis Year	2009		
				Project ID	NSMA Relocation		

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N ₁		3	1	0	2					1	1	1	
Lane Group		T	R	DefL	T					L	LT	R	
Volume, V (vph)		740	721	94	55					407	52	214	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, l ₁		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3	3	3					3	3	3	
Unit Extension, UE		3.0	3.0	3.0	3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	90	0	0		0	0		0	0	90	
Lane Width		12.0	12.0	12.0	12.0					12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0	0	0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		796	678	101	59					438	56	133	
Lane Group Capacity, c		2918	910	350	1071					531	559	475	
v/c Ratio, X		0.27	0.75	0.29	0.06					0.82	0.10	0.28	
Total Green Ratio, g/C		0.57	0.57	0.57	0.57					0.30	0.30	0.30	
Uniform Delay, d ₁		8.6	12.6	8.7	7.5					26.0	20.2	21.4	
Progression Factor, PF		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.30	0.11	0.11					0.36	0.11	0.11	
Incremental Delay, d ₂		0.1	3.4	0.5	0.0					10.3	0.1	0.3	
Initial Queue Delay, d ₃		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Control Delay		8.6	16.0	9.1	7.5					36.3	20.3	21.7	
Lane Group LOS		A	B	A	A					D	C	C	
Approach Delay		12.0			8.5						31.8		
Approach LOS		B			A						C		
Intersection Delay		17.3			X _c = 0.77			Intersection LOS			B		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	I-295 NB ramp and Malcolm X Av
Agency/Co.		Jurisdiction	Washington DC
Date Performed	4/17/2009	Analysis Year	2009
Analysis Time Period	PM Existing		

Project Description <i>NSMA Relocation</i>	
East/West Street: <i>Malcolm X Ave</i>	North/South Street: <i>I-295 NB ramp</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		534	488	194	158	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	534	488	194	158	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			1			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				68	0	59
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	68	0	59
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				LT		R

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				LT		R
v (veh/h)		194				68		59
C (m) (veh/h)		1044				261		987
v/c		0.19				0.26		0.06
95% queue length		0.68				1.01		0.19
Control Delay (s/veh)		9.2				23.6		8.9
LOS		A				C		A
Approach Delay (s/veh)	--	--				16.8		
Approach LOS	--	--				C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Firth Ster</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/24/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Existing</i>	Analysis Year <i>2009</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R	DefL	TR		L	TR			LTR	
Volume, V (vph)	192	317	168	287	68	20	5	267	81	21	959	80
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.78	0.78	0.78	0.85	0.85	0.85	0.86	0.86	0.86
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3	3	3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987	1.000	1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0	0	0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 62.5	G = 0.0	G = 0.0	G = 0.0	G = 47.5	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	256	423	215	368	109		6	380			1162	
Lane Group Capacity, c	666	970	824	399	941		62	1367			1315	
v/c Ratio, X	0.38	0.44	0.26	0.92	0.12		0.10	0.28			0.88	
Total Green Ratio, g/C	0.52	0.52	0.52	0.52	0.52		0.40	0.40			0.40	
Uniform Delay, d ₁	17.2	17.8	15.9	26.5	14.7		22.8	24.6			33.7	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50	0.50	0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	1.7	1.4	0.8	29.2	0.3		3.1	0.5			8.9	
Initial Queue Delay, d ₃	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Control Delay	18.9	19.2	16.7	55.7	14.9		25.9	25.1			42.6	
Lane Group LOS	B	B	B	E	B		C	C			D	
Approach Delay	18.5			46.4			25.1			42.6		
Approach LOS	B			D			C			D		
Intersection Delay	33.5			X _c = 0.91			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/24/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Existing</i>	Analysis Year
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			407		125						262	10
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.87		0.87						0.82	0.82
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I _l			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	10
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 48.0	G = 0.0	G = 0.0	G = 0.0	G = 22.0	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			468		144						320	0
Lane Group Capacity, c			1682		2128						975	435
v/c Ratio, X			0.28		0.07						0.33	0.00
Total Green Ratio, g/C			0.60		0.60						0.28	0.28
Uniform Delay, d ₁			7.7		6.7						23.1	21.0
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.4		0.1						0.9	0.0
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			8.1		6.7						24.0	21.0
Lane Group LOS			<i>A</i>		<i>A</i>						<i>C</i>	<i>C</i>
Approach Delay	8.1			6.7						24.0		
Approach LOS	<i>A</i>			<i>A</i>						<i>C</i>		
Intersection Delay	13.3			X _c = 0.29			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and Chesapeake Rd</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/27/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Existing</i>	Analysis Year
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N ₁	0	1	0	0	1	1	1	1	1	1	1	1	
Lane Group		LTR			LT	R	L	T	R	L	T	R	
Volume, V (vph)	12	80	24	36	3	21	9	92	73	170	444	59	
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2	
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.75	0.75	0.75	0.87	0.87	0.87	0.87	0.87	0.87	
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up Lost Time, I ₁		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type, AT		3			3	3	3	3	3	3	3	3	
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	12	0	0	10	0	0	36	0	0	59	
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08					
Timing	G = 12.4	G = 0.0	G = 0.0	G = 0.0	G = 57.6	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		119			52	15	10	106	43	195	510	0	
Lane Group Capacity, c		274			186	245	595	1341	1140	924	1341	1140	
v/c Ratio, X		0.43			0.28	0.06	0.02	0.08	0.04	0.21	0.38	0.00	
Total Green Ratio, g/C		0.16			0.16	0.16	0.72	0.72	0.72	0.72	0.72	0.72	
Uniform Delay, d ₁		30.6			29.9	28.8	3.2	3.3	3.2	3.7	4.3	3.1	
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Incremental Delay, d ₂		4.9			3.7	0.5	0.1	0.1	0.1	0.5	0.8	0.0	
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay		35.6			33.6	29.3	3.2	3.4	3.3	4.2	5.1	3.1	
Lane Group LOS		D			C	C	A	A	A	A	A	A	
Approach Delay		35.6			32.6			3.4			4.9		
Approach LOS		D			C			A			A		
Intersection Delay		9.9			X _c = 0.39			Intersection LOS			A		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection S Capitol St NB and Malcolm X
Agency or Co.	Area Type All other areas
Date Performed 4/27/2009	Jurisdiction Washington DC
Time Period AM No Action	Analysis Year 2011
	Project ID NSMA Relocation

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	62	415			681	215	76	5	4			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, I _l	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	67	446			868			90				
Lane Group Capacity, c	107	1197			1169			1816				
v/c Ratio, X	0.63	0.37			0.74			0.05				
Total Green Ratio, g/C	0.34	0.34			0.34			0.54				
Uniform Delay, d ₁	22.3	20.1			23.4			8.8				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	24.3	0.9			4.3			0.1				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	46.6	21.0			27.7			8.8				
Lane Group LOS	D	C			C			A				
Approach Delay	24.3			27.7			8.8					
Approach LOS	C			C			A					
Intersection Delay	25.4			X _c = 0.32			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information				Site Information			
Analyst	NVD			Intersection	S Capitol St SB and Malcolm X		
Agency or Co.				Area Type	All other areas		
Date Performed	4/27/2009			Jurisdiction	Washington DC		
Time Period	AM No Action			Analysis Year	2011		
				Project ID	NSMA Relocation		

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l		3	1	0	2					1	1	1	
Lane Group		T	R		LT					L	LT	R	
Volume, V (vph)		185	59	85	787					253	44	697	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, I _l		2.0	2.0		2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0		2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3		3					3	3	3	
Unit Extension, UE		3.0	3.0		3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000		1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0		0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	28	0	0		0	0		0	0	90	
Lane Width		12.0	12.0		12.0					12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0		0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		199	33		937					272	47	653	
Lane Group Capacity, c		1712	534		1062					951	1001	851	
v/c Ratio, X		0.12	0.06		0.88					0.29	0.05	0.77	
Total Green Ratio, g/C		0.34	0.34		0.34					0.54	0.54	0.54	
Uniform Delay, d ₁		18.3	17.9		25.0					10.1	8.8	14.6	
Progression Factor, PF		1.000	1.000		1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.11		0.41					0.11	0.11	0.32	
Incremental Delay, d ₂		0.0	0.0		8.9					0.2	0.0	4.3	
Initial Queue Delay, d ₃		0.0	0.0		0.0					0.0	0.0	0.0	
Control Delay		18.3	18.0		33.9					10.3	8.8	18.8	
Lane Group LOS		B	B		C					B	A	B	
Approach Delay		18.3			33.9						16.0		
Approach LOS		B			C						B		
Intersection Delay		24.0			X _c = 0.81			Intersection LOS			C		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	I-295 NB ramp and Malcolm X Av
Agency/Co.		Jurisdiction	Washington DC
Date Performed	4/27/2009	Analysis Year	2011
Analysis Time Period	AM No Action		
Project Description <i>NSMA Relocation</i>			
East/West Street: <i>Malcolm X Ave</i>		North/South Street: <i>I-295 NB ramp</i>	
Intersection Orientation: <i>East-West</i>		Study Period (hrs): <i>0.25</i>	

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		289	99	261	369	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	289	99	261	369	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				59	0	548
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	59	0	548
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		261				59		548
C (m) (veh/h)		1182				180		864
v/c		0.22				0.33		0.63
95% queue length		0.84				1.34		4.65
Control Delay (s/veh)		8.9				34.5		16.1
LOS		<i>A</i>				<i>D</i>		<i>C</i>
Approach Delay (s/veh)	--	--				17.9		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Firth Ster</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/27/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R		LTR		L	TR			LTR	
Volume, V (vph)	96	85	16	128	379	7	51	992	55	1	349	251
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.80	0.80	0.80	0.97	0.97	0.97	0.88	0.88	0.88
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3		3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987		1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0		12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0		0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 42.2	G = 0.0	G = 0.0	G = 0.0	G = 67.8	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	123	109	12		639		53	1054			615	
Lane Group Capacity, c	187	655	557		1039		399	1995			1811	
v/c Ratio, X	0.66	0.17	0.02		0.62		0.13	0.53			0.34	
Total Green Ratio, g/C	0.35	0.35	0.35		0.35		0.56	0.56			0.56	
Uniform Delay, d ₁	32.8	26.8	25.4		32.2		12.3	16.2			14.0	
Progression Factor, PF	1.000	1.000	1.000		1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50		0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	16.5	0.5	0.1		2.7		0.7	1.0			0.5	
Initial Queue Delay, d ₃	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Control Delay	49.3	27.3	25.5		34.9		13.0	17.2			14.6	
Lane Group LOS	D	C	C		C		B	B			B	
Approach Delay	38.3			34.9			17.0			14.6		
Approach LOS	D			C			B			B		
Intersection Delay	22.8			X _c = 0.58			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/27/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N ₁			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			79		674						389	122
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.83		0.94						0.91	0.91
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I ₁			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	0
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 34.7	G = 0.0	G = 0.0	G = 0.0	G = 35.3	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			95		717						427	134
Lane Group Capacity, c			1216		1539						1565	698
v/c Ratio, X			0.08		0.47						0.27	0.19
Total Green Ratio, g/C			0.43		0.43						0.44	0.44
Uniform Delay, d ₁			13.3		16.1						14.2	13.6
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.1		1.0						0.4	0.6
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			13.4		17.1						14.6	14.3
Lane Group LOS			<i>B</i>		<i>B</i>						<i>B</i>	<i>B</i>
Approach Delay	13.4			17.1						14.5		
Approach LOS	<i>B</i>			<i>B</i>						<i>B</i>		
Intersection Delay	15.8			$X_c = 0.37$			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and Chesapeake Rd</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/28/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l	0	1	0	0	1	1	1	1	1	1	1	1	
Lane Group		LTR			LT	R	L	T	R	L	T	R	
Volume, V (vph)	32	28	11	109	19	177	2	473	27	87	309	83	
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2	
Peak-Hour Factor, PHF	0.86	0.86	0.86	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up Lost Time, I _l		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type, AT		3			3	3	3	3	3	3	3	3	
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	5	0	0	60	0	0	13	0	0	40	
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08					
Timing	G = 17.0	G = 0.0	G = 0.0	G = 0.0	G = 53.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		77			136	124	2	503	15	104	368	51	
Lane Group Capacity, c		301			284	336	645	1234	1049	530	1234	1049	
v/c Ratio, X		0.26			0.48	0.37	0.00	0.41	0.01	0.20	0.30	0.05	
Total Green Ratio, g/C		0.21			0.21	0.21	0.66	0.66	0.66	0.66	0.66	0.66	
Uniform Delay, d ₁		26.2			27.6	26.9	4.6	6.2	4.6	5.2	5.7	4.7	
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Incremental Delay, d ₂		2.0			5.7	3.1	0.0	1.0	0.0	0.8	0.6	0.1	
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay		28.3			33.3	30.0	4.6	7.2	4.6	6.1	6.3	4.8	
Lane Group LOS		C			C	C	A	A	A	A	A	A	
Approach Delay		28.3			31.7			7.2			6.1		
Approach LOS		C			C			A			A		
Intersection Delay		12.6			X _c = 0.42			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/28/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	123	1075			145	97	6	0	9			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, I _l	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	134	1156			164			15				
Lane Group Capacity, c	695	2040			2025			957				
v/c Ratio, X	0.19	0.57			0.08			0.02				
Total Green Ratio, g/C	0.57	0.57			0.57			0.30				
Uniform Delay, d ₁	8.1	10.7			7.6			19.7				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	0.6	1.1			0.1			0.0				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	8.7	11.8			7.7			19.7				
Lane Group LOS	A	B			A			B				
Approach Delay	11.5			7.7			19.7					
Approach LOS	B			A			B					
Intersection Delay	11.2			X _c = 0.38			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St SB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/28/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N ₁		3	1	0	2					1	1	1	
Lane Group		<i>T</i>	<i>R</i>	<i>DefL</i>	<i>T</i>					<i>L</i>	<i>LT</i>	<i>R</i>	
Volume, V (vph)		770	750	98	57					427	54	223	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, I ₁		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3	3	3					3	3	3	
Unit Extension, UE		3.0	3.0	3.0	3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	90	0	0		0	0		0	0	90	
Lane Width		12.0	12.0	12.0	12.0					12.0	12.0	12.0	
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0	0	0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		828	710	105	61					459	58	143	
Lane Group Capacity, c		2918	910	336	1071					531	559	475	
v/c Ratio, X		0.28	0.78	0.31	0.06					0.86	0.10	0.30	
Total Green Ratio, g/C		0.57	0.57	0.57	0.57					0.30	0.30	0.30	
Uniform Delay, d ₁		8.6	13.1	8.8	7.5					26.5	20.2	21.5	
Progression Factor, PF		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.33	0.11	0.11					0.39	0.11	0.11	
Incremental Delay, d ₂		0.1	4.4	0.5	0.0					13.9	0.1	0.4	
Initial Queue Delay, d ₃		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Control Delay		8.7	17.5	9.3	7.5					40.3	20.3	21.9	
Lane Group LOS		A	B	A	A					D	C	C	
Approach Delay		12.8			8.7						34.6		
Approach LOS		B			A						C		
Intersection Delay		18.6			X _c = 0.81			Intersection LOS			B		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	I-295 NB ramp and Malcolm X Av
Agency/Co.		Jurisdiction	Washington DC
Date Performed	4/28/2009	Analysis Year	2011
Analysis Time Period	PM No Action		
Project Description <i>NSMA Relocation</i>			
East/West Street: <i>Malcolm X Ave</i>		North/South Street: <i>I-295 NB ramp</i>	
Intersection Orientation: <i>East-West</i>		Study Period (hrs): <i>0.25</i>	

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		556	508	202	164	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	556	508	202	164	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			1			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				71	0	61
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	71	0	61
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		202				71		61
C (m) (veh/h)		1025				245		983
v/c		0.20				0.29		0.06
95% queue length		0.73				1.16		0.20
Control Delay (s/veh)		9.4				25.6		8.9
LOS		<i>A</i>				<i>D</i>		<i>A</i>
Approach Delay (s/veh)	--	--				17.9		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection S Capitol St NB and Firth Ster
Agency or Co.	Area Type All other areas
Date Performed 4/28/2009	Jurisdiction Washington DC
Time Period PM No Action	Analysis Year 2011
	Project ID NSMA Relocation

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R	DefL	TR		L	TR			LTR	
Volume, V (vph)	200	330	175	299	71	21	5	278	84	22	998	83
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.78	0.78	0.78	0.85	0.85	0.85	0.86	0.86	0.86
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3	3	3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987	1.000	1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0	0	0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 62.5	G = 0.0	G = 0.0	G = 0.0	G = 47.5	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	267	440	224	383	114		6	396			1213	
Lane Group Capacity, c	663	970	824	385	941		62	1367			1312	
v/c Ratio, X	0.40	0.45	0.27	0.99	0.12		0.10	0.29			0.92	
Total Green Ratio, g/C	0.52	0.52	0.52	0.52	0.52		0.40	0.40			0.40	
Uniform Delay, d ₁	17.4	18.0	16.0	28.6	14.7		22.8	24.7			34.5	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50	0.50	0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	1.8	1.5	0.8	44.6	0.3		3.1	0.5			12.3	
Initial Queue Delay, d ₃	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Control Delay	19.2	19.5	16.9	73.2	15.0		25.9	25.3			46.9	
Lane Group LOS	B	B	B	E	B		C	C			D	
Approach Delay	18.8			59.8			25.3			46.9		
Approach LOS	B			E			C			D		
Intersection Delay	37.6			X _c = 0.96			Intersection LOS			D		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/28/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			423		130						273	10
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.87		0.87						0.82	0.82
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I _l			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	10
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 48.0	G = 0.0	G = 0.0	G = 0.0	G = 22.0	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			486		149						333	0
Lane Group Capacity, c			1682		2128						975	435
v/c Ratio, X			0.29		0.07						0.34	0.00
Total Green Ratio, g/C			0.60		0.60						0.28	0.28
Uniform Delay, d ₁			7.7		6.7						23.2	21.0
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.4		0.1						1.0	0.0
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			8.2		6.7						24.2	21.0
Lane Group LOS			<i>A</i>		<i>A</i>						<i>C</i>	<i>C</i>
Approach Delay	8.2			6.7						24.2		
Approach LOS	<i>A</i>			<i>A</i>						<i>C</i>		
Intersection Delay	13.5			$X_c = 0.31$			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and Chesapeake Rd</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>4/28/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM No Action</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N ₁	0	1	0	0	1	1	1	1	1	1	1	1
Lane Group	<i>LTR</i>			<i>LT R</i>			<i>L T R</i>			<i>L T R</i>		
Volume, V (vph)	12	83	25	37	3	22	9	96	76	177	462	61
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.75	0.75	0.75	0.87	0.87	0.87	0.87	0.87	0.87
Pretimed (P) or Actuated (A)	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>
Start-up Lost Time, I ₁		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type, AT		3			3	3	3	3	3	3	3	3
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR Volumes	0	0	12	0	0	10	0	0	36	0	0	59
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 12.4	G = 0.0	G = 0.0	G = 0.0	G = 57.6	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v		123			53	16	10	110	46	203	531	2
Lane Group Capacity, c		274			181	245	578	1341	1140	920	1341	1140
v/c Ratio, X		0.45			0.29	0.07	0.02	0.08	0.04	0.22	0.40	0.00
Total Green Ratio, g/C		0.16			0.16	0.16	0.72	0.72	0.72	0.72	0.72	0.72
Uniform Delay, d ₁		30.7			29.9	28.9	3.2	3.3	3.2	3.7	4.4	3.1
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Incremental Delay, d ₂		5.2			4.1	0.5	0.1	0.1	0.1	0.6	0.9	0.0
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay		35.9			34.0	29.4	3.2	3.5	3.3	4.3	5.3	3.1
Lane Group LOS		<i>D</i>			<i>C</i>	<i>C</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>A</i>
Approach Delay	35.9			32.9			3.4			5.0		
Approach LOS	<i>D</i>			<i>C</i>			<i>A</i>			<i>A</i>		
Intersection Delay	10.0			$X_c = 0.41$			Intersection LOS			<i>A</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N ₁	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	62	415			747	215	76	5	4			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, I ₁	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	67	446			939			90				
Lane Group Capacity, c	93	1197			1171			1816				
v/c Ratio, X	0.72	0.37			0.80			0.05				
Total Green Ratio, g/C	0.34	0.34			0.34			0.54				
Uniform Delay, d ₁	23.2	20.1			24.1			8.8				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	37.8	0.9			5.8			0.1				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	61.0	21.0			29.9			8.8				
Lane Group LOS	E	C			C			A				
Approach Delay	26.2			29.9			8.8					
Approach LOS	C			C			A					
Intersection Delay	27.4			X _c = 0.34			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St SB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l		3	1	0	2					1	1	1	
Lane Group		<i>T</i>	<i>R</i>		<i>LT</i>					<i>L</i>	<i>LT</i>	<i>R</i>	
Volume, V (vph)		185	70	85	853					253	44	697	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, I _l		2.0	2.0		2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0		2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3		3					3	3	3	
Unit Extension, UE		3.0	3.0		3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000		1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0		0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	28	0	0		0	0		0	0	90	
Lane Width		12.0	12.0		12.0					12.0	12.0	12.0	
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0		0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		199	45		1008					272	47	653	
Lane Group Capacity, c		1712	534		1067					951	1001	851	
v/c Ratio, X		0.12	0.08		0.94					0.29	0.05	0.77	
Total Green Ratio, g/C		0.34	0.34		0.34					0.54	0.54	0.54	
Uniform Delay, d ₁		18.3	18.1		25.8					10.1	8.8	14.6	
Progression Factor, PF		1.000	1.000		1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.11		0.46					0.11	0.11	0.32	
Incremental Delay, d ₂		0.0	0.1		16.0					0.2	0.0	4.3	
Initial Queue Delay, d ₃		0.0	0.0		0.0					0.0	0.0	0.0	
Control Delay		18.3	18.1		41.8					10.3	8.8	18.8	
Lane Group LOS		<i>B</i>	<i>B</i>		<i>D</i>					<i>B</i>	<i>A</i>	<i>B</i>	
Approach Delay		18.3			41.8						16.0		
Approach LOS		<i>B</i>			<i>D</i>						<i>B</i>		
Intersection Delay		27.9			<i>X_c = 0.84</i>			Intersection LOS			<i>C</i>		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	<i>I-295 NB ramp and Malcolm X Av</i>
Agency/Co.		Jurisdiction	<i>Washington DC</i>
Date Performed	5/5/2009	Analysis Year	2011
Analysis Time Period	<i>AM Anacostia</i>		

Project Description <i>NSMA Relocation</i>	
East/West Street: <i>Malcolm X Ave</i>	North/South Street: <i>I-295 NB ramp</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		289	99	261	369	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	289	99	261	369	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				59	0	614
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	59	0	614
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		261				59		614
C (m) (veh/h)		1182				180		864
v/c		0.22				0.33		0.71
95% queue length		0.84				1.34		6.16
Control Delay (s/veh)		8.9				34.5		18.7
LOS		<i>A</i>				<i>D</i>		<i>C</i>
Approach Delay (s/veh)	--	--				20.1		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Firth Ster</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R		LTR		L	TR			LTR	
Volume, V (vph)	123	99	16	128	430	7	51	992	55	1	349	374
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.80	0.80	0.80	0.97	0.97	0.97	0.88	0.88	0.88
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3		3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987		1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0		12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0		0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 42.2	G = 0.0	G = 0.0	G = 0.0	G = 67.8	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	158	127	12		702		53	1054			755	
Lane Group Capacity, c	162	655	557		1031		329	1995			1777	
v/c Ratio, X	0.98	0.19	0.02		0.68		0.16	0.53			0.42	
Total Green Ratio, g/C	0.35	0.35	0.35		0.35		0.56	0.56			0.56	
Uniform Delay, d ₁	38.4	27.1	25.4		33.2		12.5	16.2			14.9	
Progression Factor, PF	1.000	1.000	1.000		1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50		0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	64.0	0.7	0.1		3.6		1.0	1.0			0.7	
Initial Queue Delay, d ₃	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Control Delay	102.4	27.7	25.5		36.8		13.5	17.2			15.7	
Lane Group LOS	F	C	C		D		B	B			B	
Approach Delay	67.4			36.8			17.0			15.7		
Approach LOS	E			D			B			B		
Intersection Delay	26.7			X _c = 0.70			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N ₁			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			84		674						389	153
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.83		0.94						0.91	0.91
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I ₁			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	0
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 34.7	G = 0.0	G = 0.0	G = 0.0	G = 35.3	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			101		717						427	168
Lane Group Capacity, c			1216		1539						1565	698
v/c Ratio, X			0.08		0.47						0.27	0.24
Total Green Ratio, g/C			0.43		0.43						0.44	0.44
Uniform Delay, d ₁			13.3		16.1						14.2	14.0
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.1		1.0						0.4	0.8
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			13.4		17.1						14.6	14.8
Lane Group LOS			<i>B</i>		<i>B</i>						<i>B</i>	<i>B</i>
Approach Delay	13.4			17.1						14.7		
Approach LOS	<i>B</i>			<i>B</i>						<i>B</i>		
Intersection Delay	15.8			$X_c = 0.37$			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection Overlook Ave and Chesapeake Rd
Agency or Co.	Area Type All other areas
Date Performed 5/5/2009	Jurisdiction Washington DC
Time Period AM Anacostia	Analysis Year 2011
	Project ID NSMA Relocation

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	0	1	0	0	1	1	1	1	1	1	1	1
Lane Group	LTR			LT R			L T R			L T R		
Volume, V (vph)	32	28	11	109	19	177	2	473	27	92	309	83
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.86	0.86	0.86	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type, AT		3			3	3	3	3	3	3	3	3
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR Volumes	0	0	5	0	0	60	0	0	13	0	0	40
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 17.0	G = 0.0	G = 0.0	G = 0.0	G = 53.0	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v		77			136	124	2	503	15	110	368	51
Lane Group Capacity, c		301			284	336	645	1234	1049	530	1234	1049
v/c Ratio, X		0.26			0.48	0.37	0.00	0.41	0.01	0.21	0.30	0.05
Total Green Ratio, g/C		0.21			0.21	0.21	0.66	0.66	0.66	0.66	0.66	0.66
Uniform Delay, d ₁		26.2			27.6	26.9	4.6	6.2	4.6	5.3	5.7	4.7
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Incremental Delay, d ₂		2.0			5.7	3.1	0.0	1.0	0.0	0.9	0.6	0.1
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay		28.3			33.3	30.0	4.6	7.2	4.6	6.2	6.3	4.8
Lane Group LOS		C			C	C	A	A	A	A	A	A
Approach Delay	28.3			31.7			7.2			6.1		
Approach LOS	C			C			A			A		
Intersection Delay	12.5			X _c = 0.42			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection S Capitol St NB and Malcolm X
Agency or Co.	Area Type All other areas
Date Performed 5/5/2009	Jurisdiction Washington DC
Time Period PM Anacostia	Analysis Year 2011
	Project ID NSMA Relocation

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	123	1075			157	97	6	0	9			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, I _l	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	134	1156			177			15				
Lane Group Capacity, c	686	2040			2026			957				
v/c Ratio, X	0.20	0.57			0.09			0.02				
Total Green Ratio, g/C	0.57	0.57			0.57			0.30				
Uniform Delay, d ₁	8.1	10.7			7.6			19.7				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	0.6	1.1			0.1			0.0				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	8.8	11.8			7.7			19.7				
Lane Group LOS	A	B			A			B				
Approach Delay	11.5			7.7			19.7					
Approach LOS	B			A			B					
Intersection Delay	11.2			X _c = 0.38			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St SB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l		3	1	0	2					1	1	1	
Lane Group		<i>T</i>	<i>R</i>	<i>DefL</i>	<i>T</i>					<i>L</i>	<i>LT</i>	<i>R</i>	
Volume, V (vph)		770	812	98	69					427	54	223	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, I _l		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3	3	3					3	3	3	
Unit Extension, UE		3.0	3.0	3.0	3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	90	0	0		0	0		0	0	90	
Lane Width		12.0	12.0	12.0	12.0					12.0	12.0	12.0	
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0	0	0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		828	776	105	74					459	58	143	
Lane Group Capacity, c		2918	910	336	1071					531	559	475	
v/c Ratio, X		0.28	0.85	0.31	0.07					0.86	0.10	0.30	
Total Green Ratio, g/C		0.57	0.57	0.57	0.57					0.30	0.30	0.30	
Uniform Delay, d ₁		8.6	14.2	8.8	7.5					26.5	20.2	21.5	
Progression Factor, PF		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.39	0.11	0.11					0.39	0.11	0.11	
Incremental Delay, d ₂		0.1	7.9	0.5	0.0					13.9	0.1	0.4	
Initial Queue Delay, d ₃		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Control Delay		8.7	22.1	9.3	7.6					40.3	20.3	21.9	
Lane Group LOS		A	C	A	A					D	C	C	
Approach Delay		15.2			8.6						34.6		
Approach LOS		B			A						C		
Intersection Delay		19.9			X _c = 0.86			Intersection LOS			B		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	<i>I-295 NB ramp and Malcolm X Av</i>
Agency/Co.		Jurisdiction	<i>Washington DC</i>
Date Performed	5/5/2009	Analysis Year	2011
Analysis Time Period	<i>PM Anacostia</i>		
Project Description <i>NSMA Relocation</i>			
East/West Street: <i>Malcolm X Ave</i>		North/South Street: <i>I-295 NB ramp</i>	
Intersection Orientation: <i>East-West</i>		Study Period (hrs): <i>0.25</i>	

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		556	508	202	164	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	556	508	202	164	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			1			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				71	0	73
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	71	0	73
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		202				71		73
C (m) (veh/h)		1025				245		983
v/c		0.20				0.29		0.07
95% queue length		0.73				1.16		0.24
Control Delay (s/veh)		9.4				25.6		9.0
LOS		<i>A</i>				<i>D</i>		<i>A</i>
Approach Delay (s/veh)	--	--				17.2		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Firth Ster</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R	DefL	TR		L	TR			LTR	
Volume, V (vph)	294	381	175	299	82	21	5	278	84	22	998	104
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.78	0.78	0.78	0.85	0.85	0.85	0.86	0.86	0.86
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3	3	3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987	1.000	1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0	0	0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 62.5	G = 0.0	G = 0.0	G = 0.0	G = 47.5	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	392	508	224	383	128		6	396			1237	
Lane Group Capacity, c	655	970	824	332	944		62	1367			1309	
v/c Ratio, X	0.60	0.52	0.27	1.15	0.14		0.10	0.29			0.94	
Total Green Ratio, g/C	0.52	0.52	0.52	0.52	0.52		0.40	0.40			0.40	
Uniform Delay, d ₁	20.0	18.9	16.0	28.8	14.8		22.8	24.7			35.0	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50	0.50	0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	4.0	2.0	0.8	97.9	0.3		3.1	0.5			14.8	
Initial Queue Delay, d ₃	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Control Delay	24.0	20.9	16.9	126.6	15.1		25.9	25.3			49.8	
Lane Group LOS	C	C	B	F	B		C	C			D	
Approach Delay	21.2			98.7			25.3			49.8		
Approach LOS	C			F			C			D		
Intersection Delay	44.6			X _c = 1.06			Intersection LOS			D		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			452		130						273	15
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.87		0.87						0.82	0.82
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I _l			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	10
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 48.0	G = 0.0	G = 0.0	G = 0.0	G = 22.0	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			520		149						333	6
Lane Group Capacity, c			1682		2128						975	435
v/c Ratio, X			0.31		0.07						0.34	0.01
Total Green Ratio, g/C			0.60		0.60						0.28	0.28
Uniform Delay, d ₁			7.9		6.7						23.2	21.1
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.5		0.1						1.0	0.1
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			8.3		6.7						24.2	21.2
Lane Group LOS			<i>A</i>		<i>A</i>						<i>C</i>	<i>C</i>
Approach Delay	8.3			6.7						24.1		
Approach LOS	<i>A</i>			<i>A</i>						<i>C</i>		
Intersection Delay	13.4			X _c = 0.32			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and Chesapeake Rd</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/5/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Anacostia</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N ₁	0	1	0	0	1	1	1	1	1	1	1	1	
Lane Group		LTR			LT	R	L	T	R	L	T	R	
Volume, V (vph)	12	83	25	37	3	22	9	96	76	177	462	90	
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2	
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.75	0.75	0.75	0.87	0.87	0.87	0.87	0.87	0.87	
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up Lost Time, I ₁		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type, AT		3			3	3	3	3	3	3	3	3	
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	12	0	0	10	0	0	36	0	0	59	
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08					
Timing	G = 12.4	G = 0.0	G = 0.0	G = 0.0	G = 57.6	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		123			53	16	10	110	46	203	531	36	
Lane Group Capacity, c		274			181	245	578	1341	1140	920	1341	1140	
v/c Ratio, X		0.45			0.29	0.07	0.02	0.08	0.04	0.22	0.40	0.03	
Total Green Ratio, g/C		0.16			0.16	0.16	0.72	0.72	0.72	0.72	0.72	0.72	
Uniform Delay, d ₁		30.7			29.9	28.9	3.2	3.3	3.2	3.7	4.4	3.2	
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Incremental Delay, d ₂		5.2			4.1	0.5	0.1	0.1	0.1	0.6	0.9	0.1	
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay		35.9			34.0	29.4	3.2	3.5	3.3	4.3	5.3	3.3	
Lane Group LOS		D			C	C	A	A	A	A	A	A	
Approach Delay		35.9			32.9			3.4			4.9		
Approach LOS		D			C			A			A		
Intersection Delay		9.8			X _c = 0.41			Intersection LOS			A		

HCS+™ DETAILED REPORT

General Information				Site Information			
Analyst	NVD			Intersection	S Capitol St NB and Malcolm X		
Agency or Co.				Area Type	All other areas		
Date Performed	5/14/2009			Jurisdiction	Washington DC		
Time Period	AM Bellevue			Analysis Year	2011		
				Project ID	NSMA Relocation		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	64	416			721	215	76	5	4			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, I _l	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	70	447			911			90				
Lane Group Capacity, c	93	1197			1170			1816				
v/c Ratio, X	0.75	0.37			0.78			0.05				
Total Green Ratio, g/C	0.34	0.34			0.34			0.54				
Uniform Delay, d ₁	23.5	20.1			23.8			8.8				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	42.2	0.9			5.1			0.1				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	65.7	21.0			29.0			8.8				
Lane Group LOS	E	C			C			A				
Approach Delay	27.0			29.0			8.8					
Approach LOS	C			C			A					
Intersection Delay	27.1			X _c = 0.33			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection S Capitol St SB and Malcolm X
Agency or Co.	Area Type All other areas
Date Performed 5/14/2009	Jurisdiction Washington DC
Time Period AM Bellevue	Analysis Year 2011
	Project ID NSMA Relocation

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l		3	1	0	2					1	1	1	
Lane Group		T	R		LT					L	LT	R	
Volume, V (vph)		186	64	85	827					253	44	709	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, I _l		2.0	2.0		2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0		2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3		3					3	3	3	
Unit Extension, UE		3.0	3.0		3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000		1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0		0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	28	0	0		0	0		0	0	90	
Lane Width		12.0	12.0		12.0					12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0		0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 27.0	G = 0.0	G = 0.0	G = 0.0	G = 43.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		200	39		980					272	47	666	
Lane Group Capacity, c		1712	534		1065					951	1001	851	
v/c Ratio, X		0.12	0.07		0.92					0.29	0.05	0.78	
Total Green Ratio, g/C		0.34	0.34		0.34					0.54	0.54	0.54	
Uniform Delay, d ₁		18.3	18.0		25.5					10.1	8.8	14.8	
Progression Factor, PF		1.000	1.000		1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.11		0.44					0.11	0.11	0.33	
Incremental Delay, d ₂		0.0	0.1		12.6					0.2	0.0	4.8	
Initial Queue Delay, d ₃		0.0	0.0		0.0					0.0	0.0	0.0	
Control Delay		18.3	18.1		38.1					10.3	8.8	19.6	
Lane Group LOS		B	B		D					B	A	B	
Approach Delay		18.3			38.1						16.5		
Approach LOS		B			D						B		
Intersection Delay		26.3			X _c = 0.84			Intersection LOS			C		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst Agency/Co.	NVD	Intersection	I-295 NB ramp and Malcolm X Av
Date Performed	5/14/2009	Jurisdiction	Washington DC
Analysis Time Period	AM Bellevue	Analysis Year	2011
Project Description <i>NSMA Relocation</i>			
East/West Street: <i>Malcolm X Ave</i>		North/South Street: <i>I-295 NB ramp</i>	
Intersection Orientation: <i>East-West</i>		Study Period (hrs): <i>0.25</i>	

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		289	100	261	369	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	289	100	261	369	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				59	0	588
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	59	0	588
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		261				59		588
C (m) (veh/h)		1181				180		864
v/c		0.22				0.33		0.68
95% queue length		0.84				1.34		5.51
Control Delay (s/veh)		8.9				34.5		17.6
LOS		<i>A</i>				<i>D</i>		<i>C</i>
Approach Delay (s/veh)	--	--				19.1		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Firth Ster</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Bellevue</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R		LTR		L	TR			LTR	
Volume, V (vph)	98	86	16	128	385	7	51	992	55	1	349	256
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.80	0.80	0.80	0.97	0.97	0.97	0.88	0.88	0.88
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0		2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3		3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987		1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0		12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0		0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 42.2	G = 0.0	G = 0.0	G = 0.0	G = 67.8	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	126	110	12		646		53	1054			621	
Lane Group Capacity, c	184	655	557		1039		397	1995			1809	
v/c Ratio, X	0.68	0.17	0.02		0.62		0.13	0.53			0.34	
Total Green Ratio, g/C	0.35	0.35	0.35		0.35		0.56	0.56			0.56	
Uniform Delay, d ₁	33.2	26.8	25.4		32.3		12.3	16.2			14.1	
Progression Factor, PF	1.000	1.000	1.000		1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50		0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	18.5	0.5	0.1		2.8		0.7	1.0			0.5	
Initial Queue Delay, d ₃	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Control Delay	51.8	27.3	25.5		35.1		13.0	17.2			14.6	
Lane Group LOS	D	C	C		D		B	B			B	
Approach Delay	39.7			35.1			17.0			14.6		
Approach LOS	D			D			B			B		
Intersection Delay	23.0			X _c = 0.59			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and South Gate</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>AM Bellevue</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l			2		2						2	1
Lane Group			<i>R</i>		<i>T</i>						<i>T</i>	<i>R</i>
Volume, V (vph)			125		842						389	132
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.83		0.94						0.91	0.91
Pretimed (P) or Actuated (A)			<i>P</i>		<i>P</i>						<i>P</i>	<i>P</i>
Start-up Lost Time, I _l			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	0
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 34.7	G = 0.0	G = 0.0	G = 0.0	G = 35.3	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			151		896						427	145
Lane Group Capacity, c			1216		1539						1565	698
v/c Ratio, X			0.12		0.58						0.27	0.21
Total Green Ratio, g/C			0.43		0.43						0.44	0.44
Uniform Delay, d ₁			13.6		17.2						14.2	13.7
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.2		1.6						0.4	0.7
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			13.8		18.8						14.6	14.4
Lane Group LOS			<i>B</i>		<i>B</i>						<i>B</i>	<i>B</i>
Approach Delay	13.8			18.8						14.6		
Approach LOS	<i>B</i>			<i>B</i>						<i>B</i>		
Intersection Delay	16.8			$X_c = 0.43$			Intersection LOS			<i>B</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst NVD	Intersection Overlook Ave and Chesapeake Rd
Agency or Co.	Area Type All other areas
Date Performed 5/14/2009	Jurisdiction Washington DC
Time Period AM Bellevue	Analysis Year 2011
	Project ID NSMA Relocation

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l	0	1	0	0	1	1	1	1	1	1	1	1	
Lane Group		LTR			LT	R	L	T	R	L	T	R	
Volume, V (vph)	32	28	11	109	19	177	2	641	27	89	353	83	
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2	
Peak-Hour Factor, PHF	0.86	0.86	0.86	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up Lost Time, I _l		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type, AT		3			3	3	3	3	3	3	3	3	
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	5	0	0	60	0	0	13	0	0	40	
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08					
Timing	G = 17.0	G = 0.0	G = 0.0	G = 0.0	G = 53.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		77			136	124	2	682	15	106	420	51	
Lane Group Capacity, c		301			284	336	599	1234	1049	392	1234	1049	
v/c Ratio, X		0.26			0.48	0.37	0.00	0.55	0.01	0.27	0.34	0.05	
Total Green Ratio, g/C		0.21			0.21	0.21	0.66	0.66	0.66	0.66	0.66	0.66	
Uniform Delay, d ₁		26.2			27.6	26.9	4.6	7.2	4.6	5.6	5.9	4.7	
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Incremental Delay, d ₂		2.0			5.7	3.1	0.0	1.8	0.0	1.7	0.8	0.1	
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay		28.3			33.3	30.0	4.6	9.0	4.6	7.2	6.6	4.8	
Lane Group LOS		C			C	C	A	A	A	A	A	A	
Approach Delay		28.3			31.7			8.9			6.6		
Approach LOS		C			C			A			A		
Intersection Delay		12.7			X _c = 0.53			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information				Site Information			
Analyst	NVD			Intersection	S Capitol St NB and Malcolm X		
Agency or Co.				Area Type	All other areas		
Date Performed	5/5/2009			Jurisdiction	Washington DC		
Time Period	PM Bellevue			Analysis Year	2011		
				Project ID	NSMA Relocation		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	2			2	0	0	2	0			
Lane Group	L	T			TR			LTR				
Volume, V (vph)	128	1080			154	97	6	0	9			
% Heavy Vehicles, %HV	2	2			2	2	2	2	2			
Peak-Hour Factor, PHF	0.92	0.93			0.93	0.92	0.92	0.92	0.92			
Pretimed (P) or Actuated (A)	P	P			P	P	P	P	P			
Start-up Lost Time, I _l	2.0	2.0			2.0			2.0				
Extension of Effective Green, e	2.0	2.0			2.0			2.0				
Arrival Type, AT	3	3			3			3				
Unit Extension, UE	3.0	3.0			3.0			3.0				
Filtering/Metering, I	0.987	0.987			1.000			1.000				
Initial Unmet Demand, Q _b	0.0	0.0			0.0			0.0				
Ped / Bike / RTOR Volumes	0	0		0	0	90	0	0	2	0	0	
Lane Width	12.0	12.0			12.0			12.0				
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0			0			0				
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NB Only		06	07	08			
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0		G = 0.0	G = 0.0	G = 0.0			
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5		Y = 0	Y = 0	Y = 0			
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	139	1161			174			15				
Lane Group Capacity, c	688	2040			2025			957				
v/c Ratio, X	0.20	0.57			0.09			0.02				
Total Green Ratio, g/C	0.57	0.57			0.57			0.30				
Uniform Delay, d ₁	8.2	10.7			7.6			19.7				
Progression Factor, PF	1.000	1.000			1.000			1.000				
Delay Calibration, k	0.50	0.50			0.50			0.50				
Incremental Delay, d ₂	0.7	1.1			0.1			0.0				
Initial Queue Delay, d ₃	0.0	0.0			0.0			0.0				
Control Delay	8.8	11.9			7.7			19.7				
Lane Group LOS	A	B			A			B				
Approach Delay	11.6			7.7			19.7					
Approach LOS	B			A			B					
Intersection Delay	11.2			X _c = 0.38			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St SB and Malcolm X</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Bellevue</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l		3	1	0	2					1	1	1	
Lane Group		<i>T</i>	<i>R</i>	<i>DefL</i>	<i>T</i>					<i>L</i>	<i>LT</i>	<i>R</i>	
Volume, V (vph)		780	788	98	66					427	54	223	
% Heavy Vehicles, %HV		2	2	2	2					2	2	2	
Peak-Hour Factor, PHF		0.93	0.93	0.93	0.93					0.93	0.93	0.93	
Pretimed (P) or Actuated (A)		A	A	A	A					A	A	A	
Start-up Lost Time, I _l		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Extension of Effective Green, e		2.0	2.0	2.0	2.0					2.0	2.0	2.0	
Arrival Type, AT		3	3	3	3					3	3	3	
Unit Extension, UE		3.0	3.0	3.0	3.0					3.0	3.0	3.0	
Filtering/Metering, I		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	90	0	0		0	0		0	0	90	
Lane Width		12.0	12.0	12.0	12.0					12.0	12.0	12.0	
Parking / Grade / Parking	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	<i>N</i>	0	<i>N</i>	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0	0	0	0					0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	SB Only	06	07	08					
Timing	G = 46.0	G = 0.0	G = 0.0	G = 0.0	G = 24.0	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		839	751	105	71					459	58	143	
Lane Group Capacity, c		2918	910	331	1071					531	559	475	
v/c Ratio, X		0.29	0.83	0.32	0.07					0.86	0.10	0.30	
Total Green Ratio, g/C		0.57	0.57	0.57	0.57					0.30	0.30	0.30	
Uniform Delay, d ₁		8.7	13.7	8.8	7.5					26.5	20.2	21.5	
Progression Factor, PF		1.000	1.000	1.000	1.000					1.000	1.000	1.000	
Delay Calibration, k		0.11	0.36	0.11	0.11					0.39	0.11	0.11	
Incremental Delay, d ₂		0.1	6.3	0.6	0.0					13.9	0.1	0.4	
Initial Queue Delay, d ₃		0.0	0.0	0.0	0.0					0.0	0.0	0.0	
Control Delay		8.7	20.0	9.4	7.5					40.3	20.3	21.9	
Lane Group LOS		A	C	A	A					D	C	C	
Approach Delay		14.1			8.6						34.6		
Approach LOS		B			A						C		
Intersection Delay		19.3			X _c = 0.84			Intersection LOS			B		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NVD	Intersection	<i>I-295 NB ramp and Malcolm X Av</i>
Agency/Co.		Jurisdiction	<i>Washington DC</i>
Date Performed	5/14/2009	Analysis Year	2011
Analysis Time Period	<i>PM Bellevue</i>		
Project Description <i>NSMA Relocation</i>			
East/West Street: <i>Malcolm X Ave</i>		North/South Street: <i>I-295 NB ramp</i>	
Intersection Orientation: <i>East-West</i>		Study Period (hrs): <i>0.25</i>	

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		556	513	202	164	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	556	513	202	164	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			1			0
Lanes	0	2	0	0	2	0
Configuration		<i>T</i>	<i>TR</i>	<i>LT</i>	<i>T</i>	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				71	0	70
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	71	0	70
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	1	1
Configuration				<i>LT</i>		<i>R</i>

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>				<i>LT</i>		<i>R</i>
v (veh/h)		202				71		70
C (m) (veh/h)		1025				245		983
v/c		0.20				0.29		0.07
95% queue length		0.73				1.16		0.23
Control Delay (s/veh)		9.4				25.6		8.9
LOS		<i>A</i>				<i>D</i>		<i>A</i>
Approach Delay (s/veh)	--	--				17.3		
Approach LOS	--	--				<i>C</i>		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>S Capitol St NB and Firth Ster</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Bellevue</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l	1	1	1	0	2	0	1	2	0	0	2	0
Lane Group	L	T	R	DefL	TR		L	TR			LTR	
Volume, V (vph)	206	335	175	299	72	21	5	278	84	22	998	85
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.78	0.78	0.78	0.85	0.85	0.85	0.86	0.86	0.86
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up Lost Time, I _l	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0		2.0	2.0			2.0	
Arrival Type, AT	3	3	3	3	3		3	3			3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Filtering/Metering, I	0.987	0.987	0.987	1.000	1.000		1.000	1.000			1.000	
Initial Unmet Demand, Q _b	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR Volumes	0	0	7	0	0	3	0	0	25	0	0	60
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b	0	0	0	0	0		0	0			0	
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 62.5	G = 0.0	G = 0.0	G = 0.0	G = 47.5	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25							Cycle Length, C = 120.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	275	447	224	383	115		6	396			1215	
Lane Group Capacity, c	662	970	824	380	941		62	1367			1312	
v/c Ratio, X	0.42	0.46	0.27	1.01	0.12		0.10	0.29			0.93	
Total Green Ratio, g/C	0.52	0.52	0.52	0.52	0.52		0.40	0.40			0.40	
Uniform Delay, d ₁	17.6	18.1	16.0	28.8	14.7		22.8	24.7			34.6	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000		1.000	1.000			1.000	
Delay Calibration, k	0.50	0.50	0.50	0.50	0.50		0.50	0.50			0.50	
Incremental Delay, d ₂	1.9	1.6	0.8	48.2	0.3		3.1	0.5			12.5	
Initial Queue Delay, d ₃	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Control Delay	19.5	19.7	16.9	76.9	15.0		25.9	25.3			47.1	
Lane Group LOS	B	B	B	E	B		C	C			D	
Approach Delay	19.0			62.6			25.3			47.1		
Approach LOS	B			E			C			D		
Intersection Delay	38.0			X _c = 0.97			Intersection LOS			D		

HCS+™ DETAILED REPORT

General Information				Site Information			
Analyst	NVD			Intersection	Overlook Ave and South Gate		
Agency or Co.				Area Type	All other areas		
Date Performed	5/14/2009			Jurisdiction	Washington DC		
Time Period	PM Bellevue			Analysis Year	2011		
				Project ID	NSMA Relocation		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N _l			2		2						2	1
Lane Group			R		T						T	R
Volume, V (vph)			600		161						273	12
% Heavy Vehicles, %HV			2		2						2	2
Peak-Hour Factor, PHF			0.87		0.87						0.82	0.82
Pretimed (P) or Actuated (A)			P		P						P	P
Start-up Lost Time, I _l			2.0		2.0						2.0	2.0
Extension of Effective Green, e			2.0		2.0						2.0	2.0
Arrival Type, AT			3		3						3	3
Unit Extension, UE			3.0		3.0						3.0	3.0
Filtering/Metering, I			1.000		1.000						1.000	1.000
Initial Unmet Demand, Q _b			0.0		0.0						0.0	0.0
Ped / Bike / RTOR Volumes	0	0	0	0	0		0	0		0	0	10
Lane Width			12.0		12.0						12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N _m												
Buses Stopping, N _b			0		0						0	0
Min. Time for Pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 48.0	G = 0.0	G = 0.0	G = 0.0	G = 22.0	G = 0.0	G = 0.0	G = 0.0				
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0				
Duration of Analysis, T = 0.25						Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v			690		185						333	2
Lane Group Capacity, c			1682		2128						975	435
v/c Ratio, X			0.41		0.09						0.34	0.00
Total Green Ratio, g/C			0.60		0.60						0.28	0.28
Uniform Delay, d ₁			8.5		6.8						23.2	21.1
Progression Factor, PF			1.000		1.000						1.000	1.000
Delay Calibration, k			0.50		0.50						0.50	0.50
Incremental Delay, d ₂			0.7		0.1						1.0	0.0
Initial Queue Delay, d ₃			0.0		0.0						0.0	0.0
Control Delay			9.2		6.8						24.2	21.1
Lane Group LOS			A		A						C	C
Approach Delay	9.2			6.8						24.1		
Approach LOS	A			A						C		
Intersection Delay	13.0			X _c = 0.39			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information	Site Information
Analyst <i>NVD</i>	Intersection <i>Overlook Ave and Chesapeake Rd</i>
Agency or Co.	Area Type <i>All other areas</i>
Date Performed <i>5/14/2009</i>	Jurisdiction <i>Washington DC</i>
Time Period <i>PM Bellevue</i>	Analysis Year <i>2011</i>
	Project ID <i>NSMA Relocation</i>

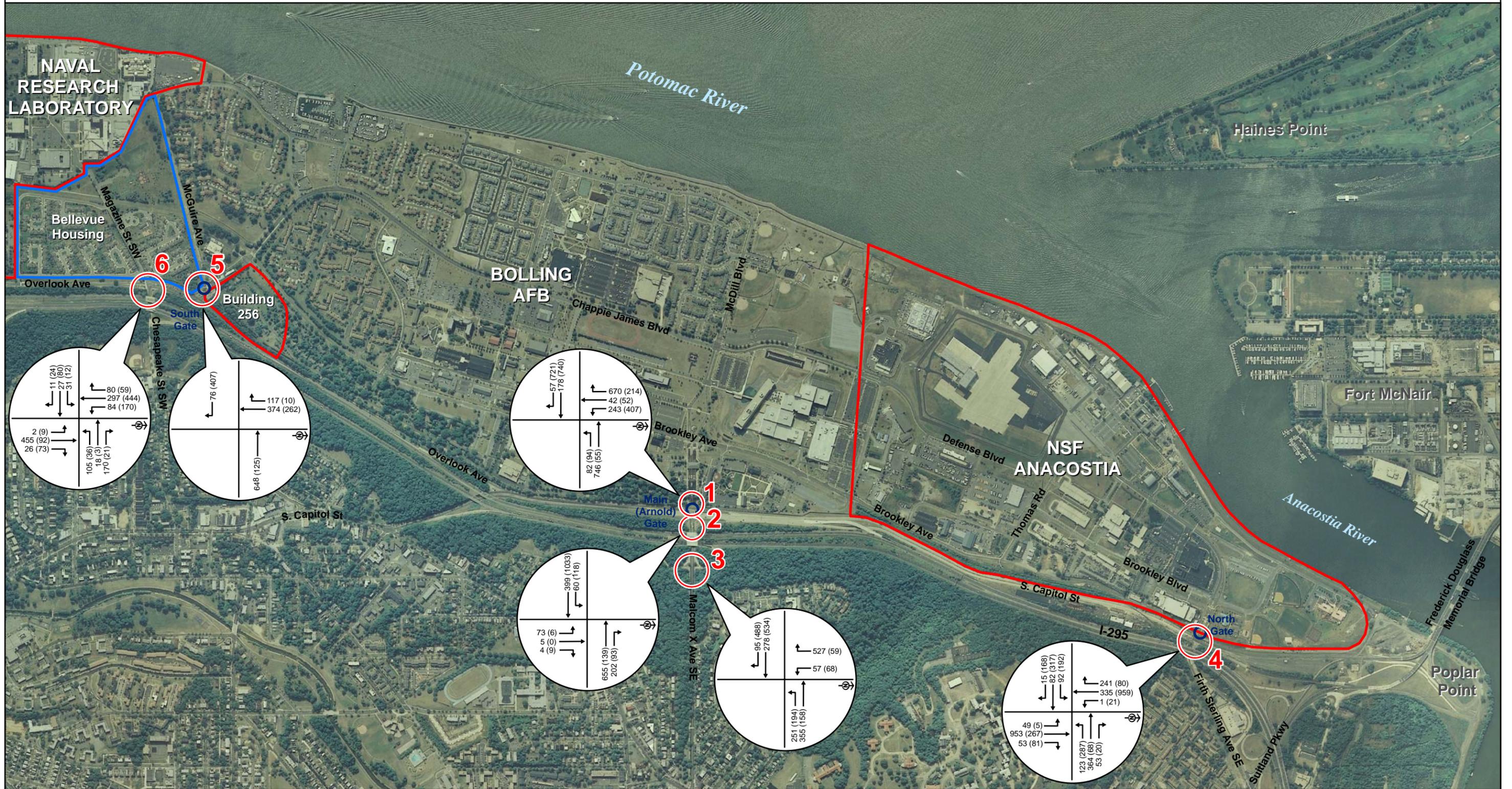
Volume and Timing Input													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Number of Lanes, N _l	0	1	0	0	1	1	1	1	1	1	1	1	
Lane Group		LTR			LT	R	L	T	R	L	T	R	
Volume, V (vph)	12	83	25	37	3	22	9	133	76	186	630	61	
% Heavy Vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2	
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.75	0.75	0.75	0.87	0.87	0.87	0.87	0.87	0.87	
Pretimed (P) or Actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up Lost Time, I _l		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green, e		2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type, AT		3			3	3	3	3	3	3	3	3	
Unit Extension, UE		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Filtering/Metering, I		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial Unmet Demand, Q _b		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	12	0	0	10	0	0	36	0	0	59	
Lane Width		12.0			12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking Maneuvers, N _m													
Buses Stopping, N _b		0			0	0	0	0	0	0	0	0	
Min. Time for Pedestrians, G _p		3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08					
Timing	G = 12.4	G = 0.0	G = 0.0	G = 0.0	G = 57.6	G = 0.0	G = 0.0	G = 0.0					
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0					
Duration of Analysis, T = 0.25							Cycle Length, C = 80.0						

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate, v		123			53	16	10	153	46	214	724	2	
Lane Group Capacity, c		274			181	245	432	1341	1140	885	1341	1140	
v/c Ratio, X		0.45			0.29	0.07	0.02	0.11	0.04	0.24	0.54	0.00	
Total Green Ratio, g/C		0.16			0.16	0.16	0.72	0.72	0.72	0.72	0.72	0.72	
Uniform Delay, d ₁		30.7			29.9	28.9	3.2	3.4	3.2	3.8	5.1	3.1	
Progression Factor, PF		1.000			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Delay Calibration, k		0.50			0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Incremental Delay, d ₂		5.2			4.1	0.5	0.1	0.2	0.1	0.6	1.6	0.0	
Initial Queue Delay, d ₃		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay		35.9			34.0	29.4	3.3	3.6	3.3	4.4	6.7	3.1	
Lane Group LOS		D			C	C	A	A	A	A	A	A	
Approach Delay		35.9			32.9			3.5			6.2		
Approach LOS		D			C			A			A		
Intersection Delay		9.9			X _c = 0.52			Intersection LOS			A		

Attachment C
Peak Hour Traffic Volume Maps

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Peak Hour Traffic Volumes - Existing Conditions (2009)



— Navy Perimeter
 Bellevue Housing
→ Direction of flow
 XX (XX) AM Volume (PM Volume)

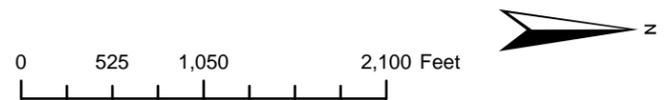
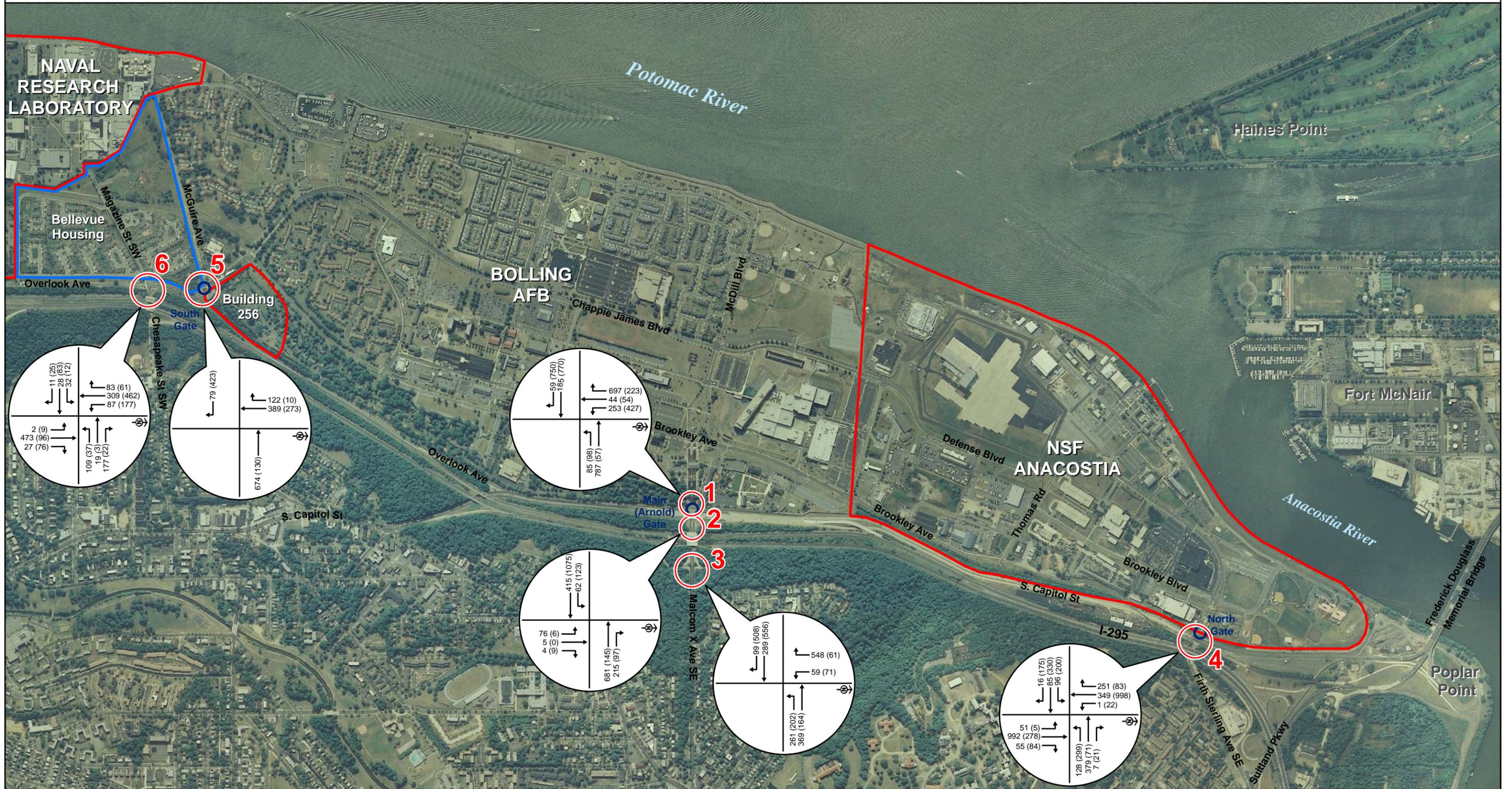


Figure C-1

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Peak Hour Traffic Volumes - No Action Conditions (2011)



— Navy Perimeter
 Bellevue Housing
 Direction of flow
 XX (XX) AM Volume (PM Volume)

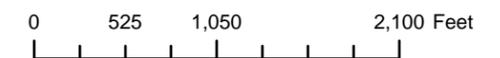


Figure C-2

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Peak Hour Traffic Volumes - Anacostia Alternative (2011)

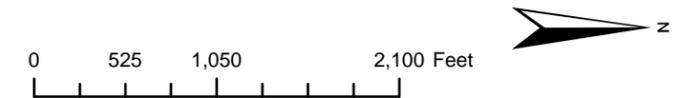
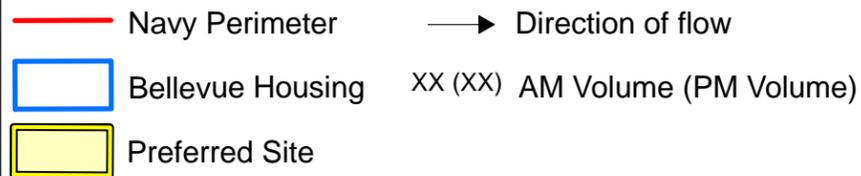
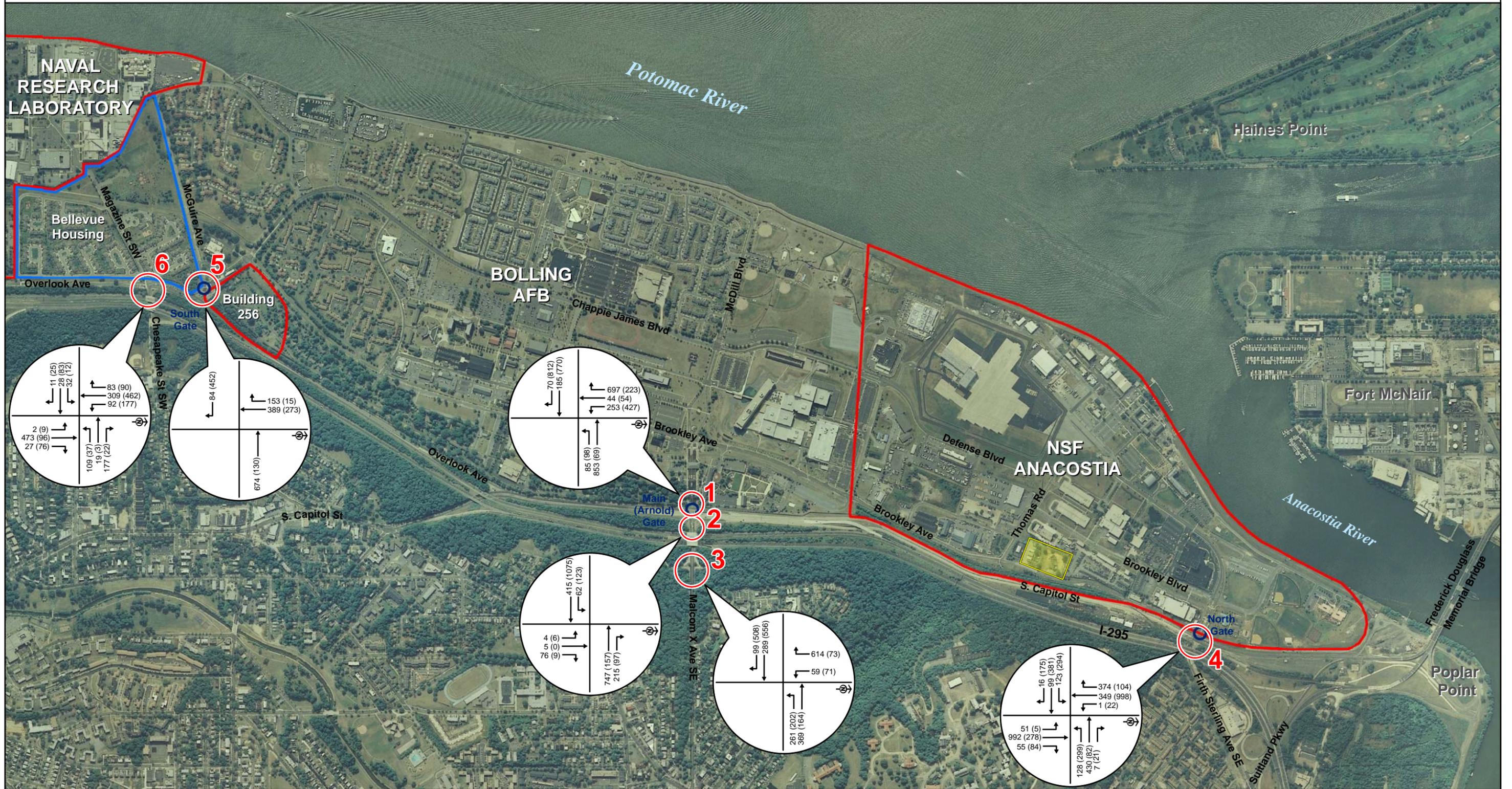


Figure C-3

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Peak Hour Traffic Volumes - Bellevue Alternative (2011)



— Navy Perimeter \longrightarrow Direction of flow
 Bellevue Housing XX (XX) AM Volume (PM Volume)
 Alternate Site

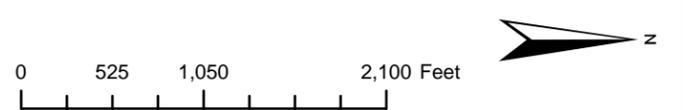
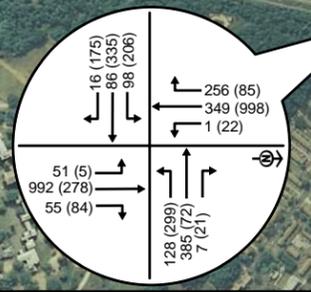
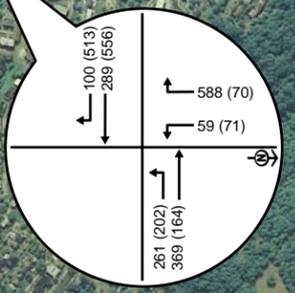
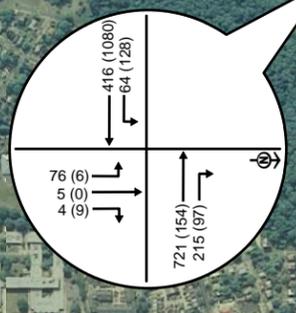
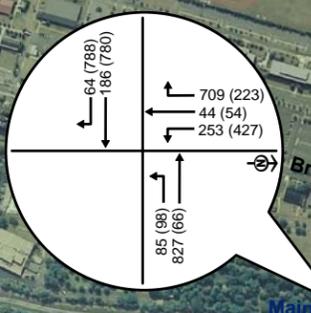
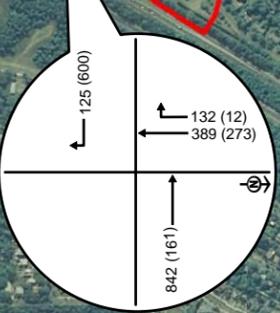
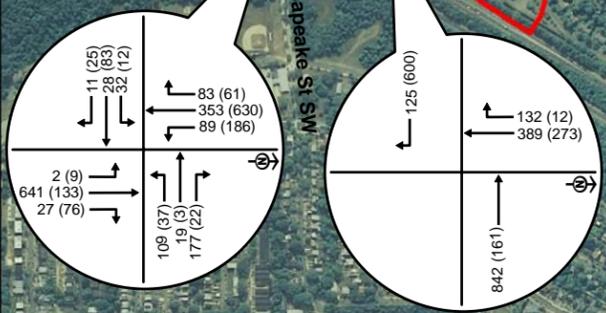


Figure C-4



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Attachment D
Bolling-Anacostia Shuttle Schedule

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Bolling/Anacostia Metro Shuttle Schedule

USAF1	Time NAVY2	NAVY3	Stop	USAF1	Time NAVY2	NAVY3
0525			6 Lodging Office			
0529			7 Bolling Clinic	1510		
0533			8 Bolling CDC			
0537			5 11th Wing HQ/P20	1513		
0541			1 Bldg 168	1517		
0550			Arrive Metro	1521		

0600	0620	0640	Depart Metro	1522		
0610	0630	0650	1 Bldg 168	1528		
0613	0633	0653	2 Anacostia CDC	1530	1550	1610
0616	0636	0656	3 Anacostia Gym	1533	1553	1613
0619	0639	0659	4 Garage on Thomas Rd	1536	1556	1616
0622	0642	0702	5 11th Wing HQ/P20	1539	1559	1619
0625	0645	0705	6 Lodging Office	1542	1602	1622
0627	0647	0707	7 Bolling Clinic	1544	1604	1624
0631	0651	0711	8 Bolling CDC	1548	1608	1628
0635	0655	0715	9 Bldg 5681	1552	1612	1632
0639	0659	0719	1 Bldg 168	1556	1616	1636
0647	0707	0727	Metro	1608	1628	1648

0700	0720	0740	Depart Metro	1620	1640	1700
0710	0730	0750	1 Bldg 168	1627	1647	1707
0713	0733	0753	2 Anacostia CDC	1630	1650	1710
0716	0736	0756	3 Anacostia Gym	1633	1653	1713
0719	0739	0759	4 Garage on Thomas Rd	1636	1656	1716
0722	0742	0802	5 11th Wing HQ/P20	1639	1659	1719
0725	0745	0805	6 Lodging Office	1642	1702	1722
0727	0747	0807	7 Bolling Clinic	1644	1704	1724
0731	0751	0811	8 Bolling CDC	1648	1708	1728
0735	0755	0815	9 Bldg 5681	1652	1712	1732
0739	0759	0819	1 Bldg 168	1656	1716	1736
0747	0807	0827	Metro	1708	1728	1748

0800	0820	0840	Depart Metro	1720	1815	
0810	0830	0850	1 Bldg 168	1727	1822	
0813	0833	0853	2 Anacostia CDC	1730	1825	
0816	0836	0856	3 Anacostia Gym	1733	1828	
0819	0839	0859	4 Garage on Thomas Rd	1736	1831	
0822	0842	0902	5 11th Wing HQ/P20	1739	1834	
0825	0845	0905	6 Lodging Office	1742	1837	
0827	0847	0907	7 Bolling Clinic	1744	1840	
0831	0851	0911	8 Bolling CDC	1748	1844	
0835	0855	0915	9 Bldg 5681	1752	1848	
			1 Bldg 168	1756		
			Metro	1808	Last Metro	

1 - Denotes shuttle/stop number on inside map.

Federal Commuter Benefits

- For 2009 all Federal employees in the National Capital Region are eligible for a transit/vanpool benefit. For details go to: www.whs.mil/DFD/Info/NCRTransitSubsidy.cfm
- IRS Code Section 132 allows reimbursement of \$20 per month for bicycling expenses

Additional Information...

COMMUTER CONNECTIONS

www.commuterconnections.org
1-800-745-RIDE (1-800-745-7433) • TTY: 202-962-3213

- Vanpool/Carpool/Ridematching Assistance
- Transit Information
- Park and Ride locations
- Enroll in Guaranteed Ride Home (Guarantees ride home in case of emergency)
- Request Commuter Information Brochures

LOCAL BUS AND RAIL

www.wmata.com
202-637-7000 • TTY: 202-638-3780

- Metrobus (W4 Route stops in the vicinity of the Firth Sterling Gate and the Bolling AFB Main Gate)
- Metrorail (Green Line - Shuttle Service for DoD Employees from Metro Anacostia Station to Anacostia NSF and Bolling AFB)

REGIONAL COMMUTER OPTIONS

www.mtmaryland.com
1-866-RIDE-MTA (1-866-743-3682) • TTY: 410-539-3497

- Express Bus Service (Route 907) from Charles County (With stop outside Main Gate)
- MARC Train Service to Union Station from North

www.vre.org
1-800-RIDE-VRE (1-800-743-3873) • TTY: 703-684-0551

- Virginia Railway Express Train Service to Union Station from South

PROPOSED SERVICES/FACILITIES

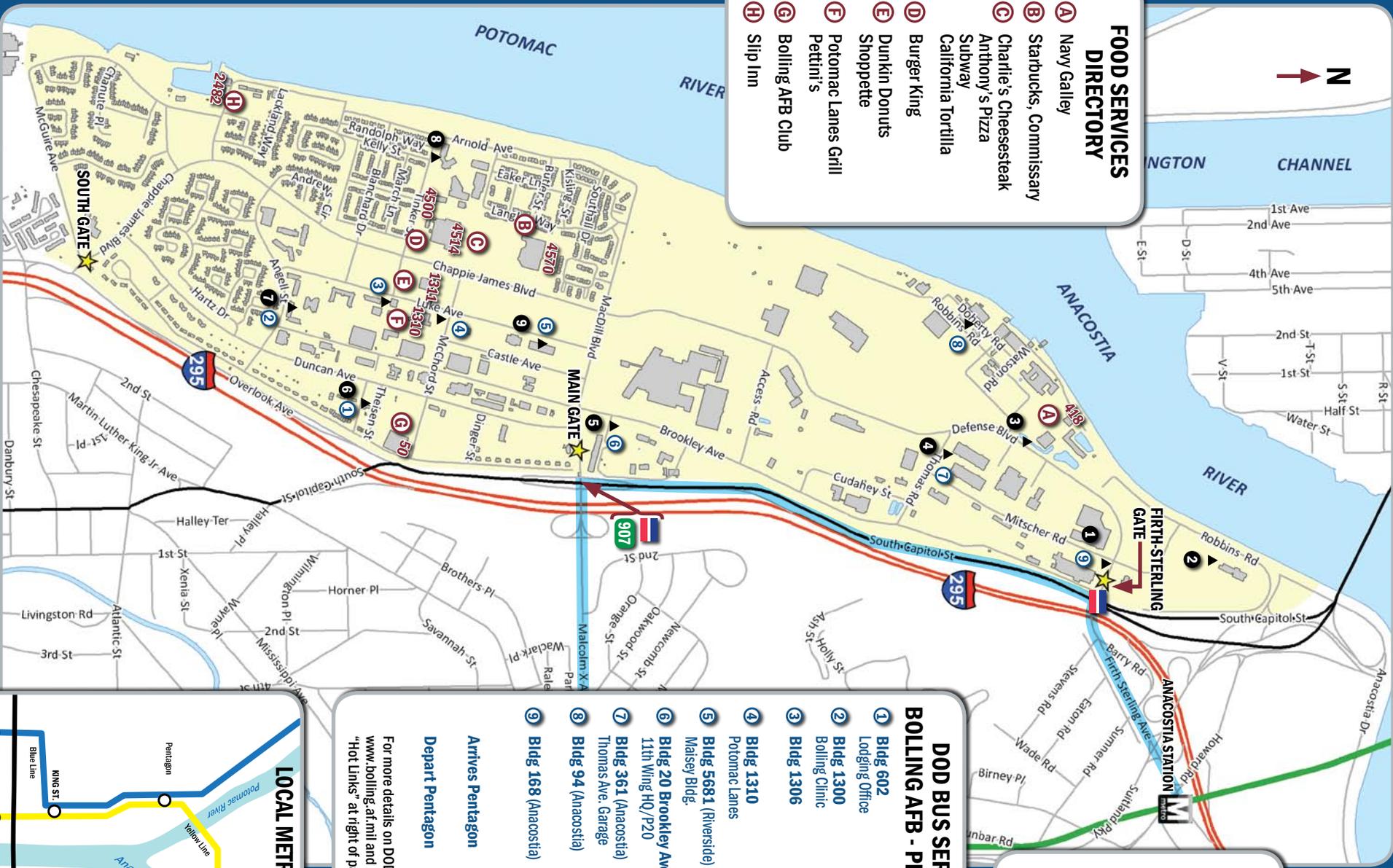
- Anacostia Streetcar service to Firth Sterling Gate arriving in 2010
- South Capitol Street Bridge Replacement Project
- Riverwalk Trail proposed along both banks of Anacostia River

For more commuter information contact your commuting representative at afdww.a7b.afncr.af.mil

Commuter Transportation Alternatives

BOLLING AIR FORCE BASE





- ### FOOD SERVICES DIRECTORY
- A** Navy Galley
 - B** Starbucks, Commissary
 - C** Charlie's Cheesesteak
 - D** Dunkin Donuts
 - E** Shoppette
 - F** Potomac Lanes Grill
 - G** Boiling AFB Club
 - H** Slip Inn

- ### BUS/SHUTTLE LEGEND
- W4 Metrobus Route
 - Metrobus Stops
 - MTA Rt 907 Bus Stop
 - DOD Bus Stop No.
 - Metro Shuttle Stop No.
 - Onbase Bus/Shuttle Stop Location

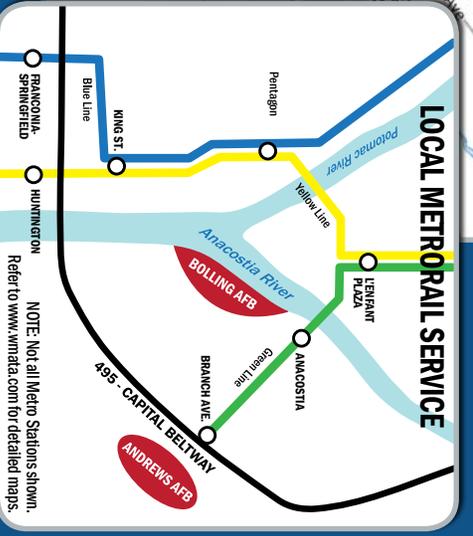
DOD BUS SERVICE BOLLING AFB - PENTAGON

Effective 04 Jan 2008

Route	Arrives Pentagon	Depart Pentagon
1 Bldg 602 Lodging Office	0900 1000 1100 1200	1300 1400 1500
2 Bldg 1300 Bolling Clinic	0903 1003 1103 1203	1303 1403 1503
3 Bldg 1306	0905 1005 1105 1205	1305 1405 1505
4 Bldg 1310 Potomac Lanes	0906 1006 1106 1206	1306 1406 1506
5 Bldg 5681 (Riverside) Malsey Bldg.	0908 1008 1108 1208	1308 1408 1508
6 Bldg 20 Brookley Ave 11th Wing HQ/P20	0911 1011 1111 1211	1311 1411 1511
7 Bldg 361 (Anacostia) Thomas Ave. Garage	0913 1013 1113 1213	1313 1413 1513
8 Bldg 94 (Anacostia)	0915 1015 1115 1215	1315 1415 1515
9 Bldg 168 (Anacostia)	0918 1018 1118 1218	1318 1418 1518

Arrives Pentagon: 0935 1035 1135 1235
 Depart Pentagon: 0940 1040 1140 1240

For more details on DOD bus service refer to www.bolling.af.mil and click on "Bus Schedules" under "Hot Links" at right of page.



APPENDIX D

Correspondence

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
Public Works Department Washington
1013 O Street SE, Bldg 166, Suite 100N
Washington Navy Yard, DC 20374

5090
September 4, 2009

Mr. David Maloney
Attn: Mr. Steven Callcott
Office of Planning/D.C. State Historic Preservation Office
2000 14th St. N.W.
Suite 401
Washington, D.C. 20009

Dear Mr. Callcott:

SUBJECT: PROPOSED RELOCATION OF NAVY SYSTEMS MANAGEMENT ACTIVITY

The Navy is planning to relocate the Navy Systems Management Activity (NSMA) from several locations in Arlington County, Virginia, to a new, consolidated facility at Naval Support Facility (NSF) Anacostia in the District of Columbia. The relocation is to comply with a mandate by the Base Realignment and Closure (BRAC) Act of 2005. The agency would occupy the new facility in 2011.

The mission of NSMA is to provide logistics support to the Navy. This involves the management of the flow of goods, information, or other resources between the point of production and the point of consumption or use. It includes warehousing, inventory, handling, packaging, transportation, and delivery.

The new consolidated facility will consist of a combined administrative and warehouse facility located on a three acre site at NSF Anacostia. The administrative building will provide approximately 160,000 gross square feet of space, with a footprint of approximately 32,000 square feet. It will be a reinforced steel-framed masonry structure on a pile foundation system. Approximately half of the roof will be dedicated to a green roof feature and about 30 percent to a paved deck accessible to personnel during breaks and lunch hour. Exterior work will involve lighting, roadway improvements, paved parking (46 parking spots) and driving areas, sidewalks, storm water management features, and low water usage landscaping. The warehouse will be built adjacent to the administrative facility. It will be approximately 23,000 square feet in size, with an 18-foot overhead clearance and will include three loading docks, (see enclosure 2).

There are currently no existing buildings or structures on NSF Anacostia or Bellevue Housing that can accommodate the NSMA facility.

To minimize the potential impact of the NSMA facility to historic resources, and meet the needed requirements, the Navy evaluated two potential locations, (see enclosure 1). The first was at NSF Anacostia and the second was at Bellevue Housing. They are as follows:

NSF Anacostia

The proposed site on NSF Anacostia is located northwest of the intersection of Brookley Avenue and Thomas Road. The northern part of the site consists of a parcel formerly occupied by Building 150,

now demolished. The southern part of the site consists of a paved lot occupied by several temporary trailers and a semi-permanent building (Building 387).

In this location, there are no listed or eligible National Register of Historic Places District(s), or individual buildings or structures listed or eligible for inclusion into the National Register of Historic Places. This area has been extensively disturbed and according to the Archeological Assessment of Anacostia Annex performed by the Louis Berger Group Inc., in 1995, the site has no archeological potential. Buildings 168 and 169 located north-east of the proposed site on NSF Anacostia, have been determined eligible for inclusion into the National Register of Historic Places, and will be in the view shed of the new facility. Whereas the new facility will be sufficiently remote from Building 168, and whereas Building 168 massing is large and constructed of brick, the visual impact should not be adversely affected.

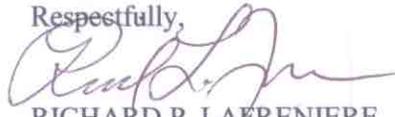
Bellevue Housing

The proposed site on Bellevue Housing is located on property that is south of NSF Anacostia, between Bolling Air Force Base and the Naval Research Laboratory. This site is at the northwest corner of Bellevue Housing and faces McGuire Avenue. The site is currently open, vegetated with grass and several hardwood trees.

In this location, the new facility would be situated between, but not adjacent to, the Naval Research Laboratory and the Bolling Air Force Base Historic Districts. It is sufficiently remote from the districts to make the potential for direct visual impact minimal. However, construction at this site would impact a potential prehistoric archeological site identified the Phase 1A Archeological and Cultural Resources Survey (followed up by a Phase 1B) performed on Bellevue Housing by John Milner Associates.

As a result of these two site evaluations, the Navy is proposing to construct the new NSMA facility on NSF Anacostia. The Navy believes that this proposed action will have no adverse effect to cultural resources. We look forward to your comments on our proposed plan. If you need additional information or clarification relating to this project, or would like to visit the installation, please call Mr. James Dolph, (NDW Cultural Resources Manager), at 207-438-2320 or email: James.Dolph@navy.mil.

Respectfully,



RICHARD P. LAFRENIERE
Installation Environment Program Manager
By direction of the Commanding Officer

Enclosures: 1. Alternative Site Location and Location of Building 168
2. Facility Design Plan

_____ Concur / Do Not Concur _____ Date

Project Sites Considered at NSF Anacostia & Bellevue Housing



- Navy Perimeter
- Bellevue Housing
- Preferred Site (Anacostia Alternative)
- Alternate Site (Bellevue Alternative)

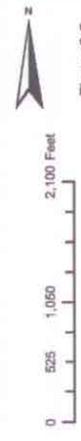
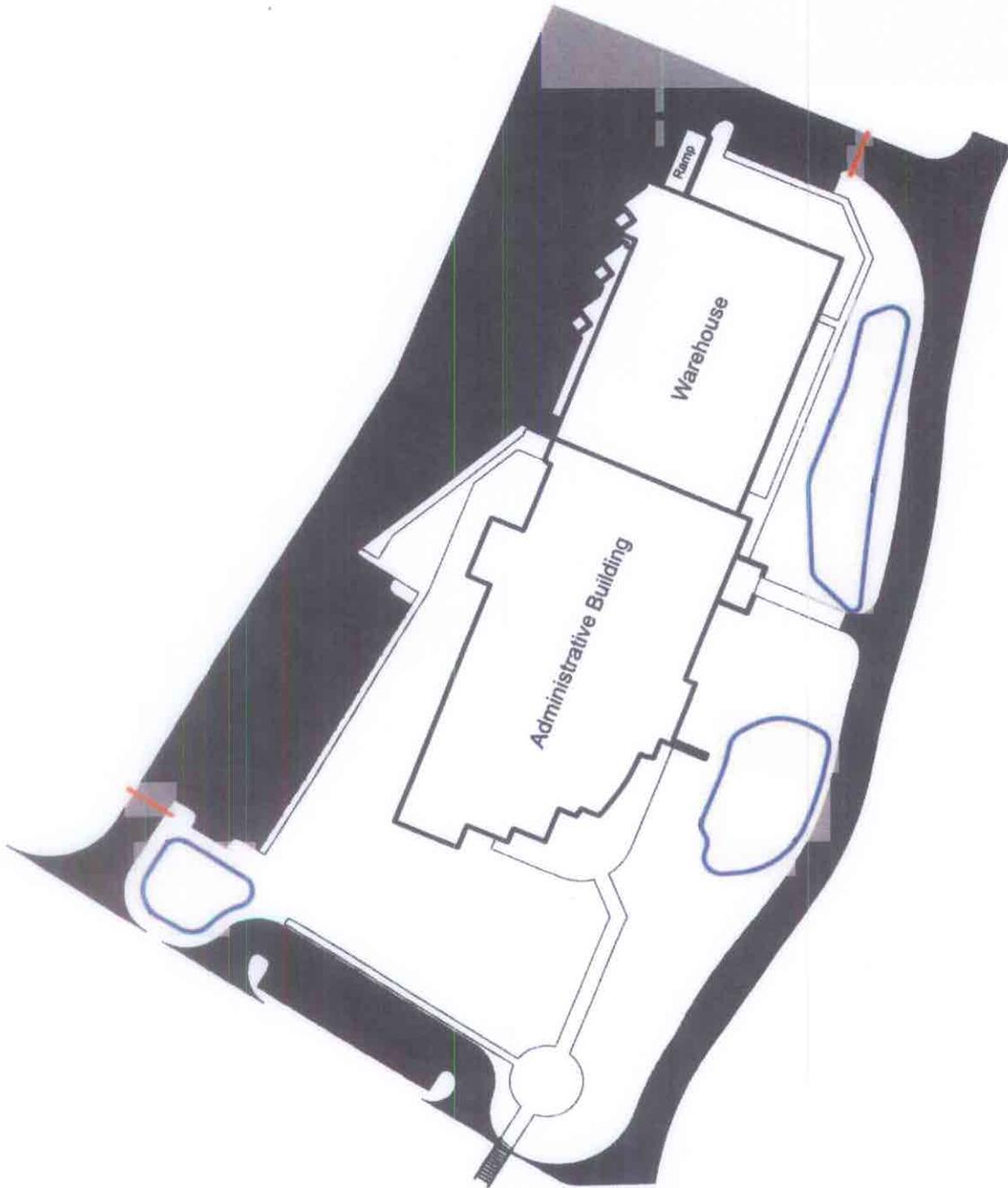


Figure 2-2

Proposed Combined Facility



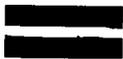
- Gate
- Sidewalk
- Pavement
- Stormwater Management Pond

0 50 100 200 Feet



Figure 3

GOVERNMENT OF THE DISTRICT OF COLUMBIA
HISTORIC PRESERVATION OFFICE
OFFICE OF PLANNING



September 30, 2009

Mr. Richard P. Lafreniere
Installation Environmental Program Manager
Naval Facilities Engineering Command Washington
Public Works Department Washington
1013 O Street, SE
Building 166, Suite 100N
Washington, DC 20374

RE: Proposed Relocation of Navy Systems Management Activity to Naval Support Facility Anacostia

Dear Mr. Lafreniere:

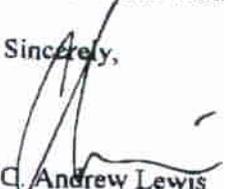
Thank you for contacting the DC State Historic Preservation Office (SHPO) regarding the above-referenced undertaking. We have reviewed the project information in accordance with Section 106 of the National Historic Preservation Act and are writing to provide our comments regarding effects on historic properties.

Based upon our review of your submittal, we understand that this undertaking involves constructing a new facility to house the Navy Systems Management Activity (NSMA). Two potential locations for the new facility were considered. These locations included a site at the Naval Support Facility (NSF) Anacostia and a site at Bellevue Housing.

The NSF Anacostia site is not located within, or adjacent to, a historic district and it has no potential for archaeological resources. The only historic properties in the general area are two eligible buildings (Buildings 168 and 169) which are located some distance away. The Bellevue Housing site is adjacent to two historic districts and is also the location of a potential, prehistoric archaeological site. In order to avoid potential adverse effects on these historic properties, the Navy selected the NSF Anacostia site as the location for the NSMA. The DC SHPO appreciates the Navy's efforts to protect historic properties and concurs with the determination of "no adverse effect." Therefore, no further consultation will be required.

If you should have any questions or comments regarding the historic built environment, please contact me at andrew.lewis@dc.gov or 202-442-8841. For questions or comments relating to archaeology, please contact Ruth Troccoli at ruth.troccoli@dc.gov or 202-442-8836. Thank you for providing this opportunity to review and comment.

Sincerely,


C. Andrew Lewis
Senior Historic Preservation Specialist
DC State Historic Preservation Office

09-266

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