Medical Facilities Development and University Expansion

DRAFT ENVIRONMENTAL IMPACT STATEMENT
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Naval Support Activity Bethesda

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Medical Facilities Development and University Expansion

NSA Bethesda

Department of the Navy

September 2012

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COVER SHEET

Action Proponent: U.S. Navy, Naval Support Activity Bethesda, Bethesda, Maryland.

Proposed Actions: Medical Facilities Development and University Expansion at Naval Support Activity Bethesda, Bethesda, Maryland.

Designation: Draft Environmental Impact Statement (Draft EIS).

Abstract:

This Draft EIS evaluates the potential environmental effects of the two proposed actions at Naval Support Activity Bethesda. The purpose of the Medical Facilities Development is to implement the Congressional mandate in the Fiscal Year 2010 National Defense Authorization Act to achieve the new statutory world-class standards for military medicine at the Walter Reed National Military Medical Center at Bethesda (WRNMMC). This proposed action is needed because current space is insufficient to meet world-class standards. The purpose of the proposed University Expansion would address the space and operational limitations at the Uniformed Services University of the Health Sciences (USU or the University). The University Expansion is needed because USU operations are currently dispersed between the main USU buildings and 19 other facilities. The proposed actions would enhance and support but not add to the missions of the installation, medical center, or the University. The proposed actions include: 1) the demolition of five hospital buildings and reconstruction of a single 5-story facility and associated parking garage for visitors, patients, and very important persons (VIPs); utility capacity upgrades; accessibility and appearance improvement projects; internal renovation of five hospital buildings; internal and external renovations of a workshop/warehouse to office space; and temporary medical facilities to provide uninterrupted patient care during construction (Medical Facilities Development) and 2) the construction of a new education/research facility and associated parking garage at USU (University Expansion), and the internal renovation of existing USU buildings. The Draft EIS also considers the No Action Alternative to evaluate the impacts at NSA Bethesda in the event that the proposed actions do not occur.

There are no cooperating agencies for the preparation of this EIS.

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EXECUTIVE SUMMARY

General

This environmental impact statement (EIS) evaluates the potential environmental effects associated with the two proposed actions at Naval Support Activity (NSA) Bethesda. One proposed action, the Medical Facilities Development, would implement the Congressional mandate of the Fiscal Year 2010 National Defense Authorization Act (2010 NDAA) to achieve the new statutory world-class standards for military medicine at the Walter Reed National Military Medical Center (WRNMMC). This proposed action would provide enduring medical facilities commensurate in quality, capability, and condition with those provided by the 2005 Base Realignment and Closure (BRAC) investment. The other proposed action, University Expansion, would address the space and operational limitations at the Uniformed Services University of the Health Sciences (USU or the University). The proposed actions would enhance and support but not add to the missions of the installation, medical center, or the University.

The Medical Facilities Development would include:

- the demolition of five hospital buildings and construction of a single 5-story facility and associated parking garage for visitors, patients, and very important persons (VIPs);
- internal renovation of five hospital buildings;
- temporary medical facilities to provide uninterrupted patient care during construction;
- utility capacity upgrades;
- accessibility and appearance improvement projects; and
- internal and external renovations of a workshop/warehouse to office space.

The University Expansion would include the construction of a new education/research facility and associated above-ground parking garage at USU and the internal renovation of existing USU buildings.

The EIS also considers the No Action Alternative that evaluates the impacts at NSA Bethesda in the event that the proposed actions do not occur.

The proposed actions are two components of the 2012 NSA Bethesda Master Plan that the Department of the Navy (DoN or the Navy) is currently updating. The 2012 NSA Bethesda Master Plan reflects ongoing projects previously considered under the National Environmental Policy Act (NEPA) of 1969 and the potential future development opportunities at NSA Bethesda. The EIS evaluates the cumulative effects of the proposed actions in the context of known, ongoing activities and

identifies the potential programmatic effects of the proposed actions in the context of potential future development opportunities. Therefore, the EIS analyzes the environmental effects of the 2012 NSA Bethesda Master Plan relative to the implementation of the proposed actions described herein. For the potential future development opportunities, the Navy would ensure the appropriate NEPA review is completed when the projects are proposed for implementation.

This EIS is prepared pursuant to Section (102)(2)(c) of NEPA, the regulations implemented by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500 – 1508), DoN NEPA implementing regulations at 32 CFR Part 775, and OPNAVINST 5090.1C-CH1 (July 2011).

There are no cooperating agencies for the preparation of this EIS.

NSA Bethesda is the action proponent, and the Navy is the lead agency for the proposed actions. Joint Task Force National Capital Region Medical (JTF CapMed), WRNMMC, and USU are tenants of NSA.

The Navy published a Notice of Intent (NOI) to prepare an EIS in the Federal Register on 19 August 2011. The Federal Register publication initiated a 46-day scoping period that began on 19 August 2011, and ended on 3 October 2011. The NOI provided general information on the Navy's proposed actions, an announcement of public scoping meetings, and contact information for providing comments. The Navy also placed notices in the local newspapers: the Washington Post (August 25, 26, and 27), the Washington Times (August 26, 29, and 30), and Montgomery County Gazette (August 29 – Gaithersburg, Bethesda, Potomac, and Rockville). Notices of the public scoping meetings were mailed to 697 local community associations and members of the general public and 70 Federal, state, and local government entities and elected officials. The notice was also posted on the project website: http://www.bethesda.med.navy.mil/nsa/eis.aspx. Appendix A of this EIS includes the list of Federal, state, and local agencies/representatives that were informed of the proposed actions and the scoping meetings.

During the 46-day scoping period, the public was invited to provide comments on environmental issues that should be considered in the development and analysis of alternatives. Comments were accepted at the public scoping meetings, as well as by mail, email, project website, or telephone. The Navy held two public scoping meetings on 7 and 12 September 2011, at the Pooks Hills Marriott in Bethesda, Maryland. The public scoping meetings were a combination of an open house and formal presentation. The first portion of the meeting was an open house format; information on the proposed actions was displayed on poster boards and knowledgeable Navy representatives were available to answer questions. The open house session was followed by the Navy's presentation and a public hearing session, which was transcribed by a court reporter.

The attendees of the two public scoping meetings included representatives from Federal, state, and local agencies; community organizations; neighborhood associations; and residents of surrounding neighborhoods. Representatives of the offices of the United States Congress, Maryland General Assembly, Montgomery County Council, and the Montgomery County Executive Office also attended the public scoping meetings.

One comment card was submitted during the two public scoping meetings and one commenter provided comments to a Navy representative. A total of six attendees provided verbal comments during the two meetings. Additionally, 11 commenters provided comments via email, and 3 commenters provided comments via mail. No comments were received via telephone. Comments received during the scoping period are included in Appendix A and were considered in the preparation of the Draft EIS.

The Draft EIS is made available for public review and comment. The U.S. Environmental Protection Agency (USEPA) will publish a Notice of Availability (NOA) and the Navy will publish a Notice of Public Hearing (NOPH) for the Draft EIS in the Federal Register. These will notify the public that the Draft EIS is available, where it can be obtained for review and comment, and provide information on the public hearings. Public hearings will occur for the Draft EIS during a 45-day public comment period that commences with the publication of the USEPA's NOA of the Draft EIS in the Federal Register. Comments provided by members of the public and Federal, state, and local agencies on the Draft EIS will be reviewed and addressed before the Final EIS is released. The USEPA's NOA of the Final EIS will be published in the Federal Register to inform the public that the Final EIS has been released. Publication of the USEPA's NOA of the Final EIS begins the 30-day Wait Period (also known as the no action period). Comments received during the 30-day Wait Period will be considered in reaching the final decision on the proposed action. Following the 30-day Wait Period, a Record of Decision (ROD) will be prepared. The ROD is a concise summary of the decision made by the Secretary of the Navy or his/her designee from the alternatives presented in a Final EIS. The ROD will state the decision, identify alternatives considered (including the environmentally preferable alternative), address substantive comments received from the Final EIS that were not previously addressed, and discuss other considerations that influenced the decision identified. The ROD will also address implementation of all practical means to avoid impacts from the chosen alternative, any decision behind the non-implementation of any of these means, and monitoring associated with mitigation. Following signature of the ROD, the Navy will publish an NOA of the ROD in the Federal Register.

Throughout this process, the public will be able to obtain information on the status and progress of the proposed action and the EIS through the NSA Bethesda Public Affairs Office. The Navy is committed to interagency coordination to promote early and continuing involvement of the agencies, as well as quick resolution of issues, better evaluation of alternatives, and identification of mitigation measures.

To this end, the Navy has initiated early coordination with the various Federal, state, and local agencies. For the EIS traffic study, the Navy initiated early coordination with the Maryland National Capital Park and Planning Commission (M-NCPPC), Maryland State Highway Administration (MSHA), and Montgomery County Department of Transportation (MCDOT) to ensure that the agencies were in agreement with the methodology used in the traffic study. To ensure effective collaboration and communication, the Navy also initiated early coordination with the Maryland Historical Trust (MHT), the National Capital Planning Commission (NCPC), and the Advisory Council on Historic Preservation (ACHP) early in the EIS process. After EIS NOI publication, the Navy initiated formal Section 106 consultation with MHT and ACHP. Meetings with some or all of these entities occurred on: 3 November 2010, 9 December 2010, 11 May 2011, 10 November 2011, 8 March 2012, and 21 March 2012. ACHP has responded that, based on the documentation provided by the Navy, the agency believes that its participation is not warranted at this stage; however, the agency will have an opportunity to comment on the Draft and Final EIS during the public review periods.

The Navy also contacted the U.S. Fish and Wildlife Service (USFWS) and the Maryland Department of Natural Resources (MDNR) on 11 October 2011, to request a list of endangered or threatened species that have the potential to occur at NSA Bethesda. USFWS has determined that, except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project areas for the proposed actions. Therefore, the Navy is not required to consult with USFWS to satisfy Section 7 of the Endangered Species Act (ESA). Should Federal endangered or threatened transients be discovered within the proposed project areas during construction, the Navy would adhere to all requirements under ESA. MDNR has determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites and therefore, the agency does not have specific comments or requirements pertaining to protection measures at this time.

Location

The 243-acre NSA Bethesda is bounded by Maryland Route 355 (Rockville Pike) to the west, with the National Institutes of Health (NIH) main campus and the Medical Center Metro Station located just beyond the roadway to the west; Stone Ridge School of the Sacred Heart (Pre-K to 12 girls school) and residential housing to the north; North Chevy Chase Recreation Center, residential housing, including the state designated Hawkins Lane Historic District, and Rock Creek Park to the east; and Columbia Country Club, residential housing, and parks to the south. Interstate 495 (I-495) and Rock Creek Park are adjacent to the northeastern corner of the installation. Jones Bridge Road forms the southern boundary of the installation.

Background

NSA Bethesda supports WRNMMC, which is a world-renowned medical facility that serves as the President's hospital and serves the nation's leaders, warriors (past and present), and their families. WRNMMC is NSA Bethesda's largest tenant. The installation also supports numerous medical, research, health support, and welfare/relief commands in the Military Health System (MHS), including USU. These tenant commands have the goal of providing the full spectrum of medical and recovery services to members of the Armed Forces and their families.

NSA Bethesda was established as the National Naval Medical Center (NNMC) in 1940 and originally comprised the Naval Hospital, the Naval Medical School, the Naval Dental School, and the Naval Medical Research Institute. Historically, the entire installation of NSA Bethesda has been known as NNMC. In May 2010, the Navy changed the management of the installation from the Bureau of Medicine and Surgery to the Commander, Navy Installations Command (CNIC). The entire installation then became NSA Bethesda and the medical center (NNMC) became its tenant.

As stated in NSA Bethesda's Commander's Intent - Mission, Vision, Culture and Norms (NAVFAC, 2012a), the installation's mission is to:

"…"tactically execute efficient and effective shore installation management services and programs in support of mission commanders to enable combat readiness for fleet, fighter, and family." In simple language our sole reason to exist is to support our tenant commands in their pursuit of excellence in patient care, medical research and education. It is important that we support not only those who work at the commands, the staff, but also those who use the commands as well: patients and students."

USU

USU is another major tenant at NSA Bethesda and is a component of the Military Health System. The institution is the nation's only fully accredited Federal School of Medicine and Graduate School of Nursing. Called the West Point of Medicine, USU was chartered by an act of Congress on 21 September 1972, and has the unique mission to provide the nation with health professionals dedicated to career service in DoD and the U.S. Public Health Service.

Currently, USU is engaged in an ambitious plan to become the core academic health research center of WRNMMC and create a stronger, more effective military medical system (USU, 2011).

World Class Medical Facility

Beginning in 1990, when the installation was still NNMC, the goal of its Master Plan was to stabilize patient care operations and provide

increased access to patient services. The 2008 NNMC Master Plan update provided a logical basis and a framework for the anticipated development throughout the installation to fulfill the requirements of the 2005 BRAC mandated relocation, which transitioned four inpatient hospitals into two and concluded in September 2011.

In May 2008, the NCR BRAC Health Systems Advisory Subcommittee (HSAS) of the Defense Health Board (DHB) was convened to advise DoD on the planned integration of military medical facilities in the NCR.

In October 2008, NDAA 2009 required an independent review to determine whether plans for WRNMMC and Fort Belvoir Community Hospital (FBCH) would provide world-class medical facilities. This review was performed by the DHB HSAS, which subsequently published its report in May 2009 titled "Achieving World-Class, an Independent Review of the Design Plans for the Walter Reed National Military Medical Center and the Fort Belvoir Community Hospital." In its report, the DHB developed an operational definition for a "world-class medical facility" and identified several areas where the plans for WRNMMC facilities did not meet this standard. As required by the NDAA 2009, it also provided recommendations to address these areas, to include:

- Full conversion to single-patient rooms (DoD standard 250 SF for family members to visit, wheel chair access, etc.);
- Expand size of the operating suites and other areas to accommodate current and future medical technologies;
- Develop Information Management and Information Technology infrastructure that is interoperable and supports the latest medical technologies;
- Expand support services and patient amenities (food service, day care, parking, wayfinding, etc.); and
- Expand on-site simulation capability to maintain the skills of clinicians.

In October 2009, the NDAA 2010 codified the DHB's operational definition for a "world-class medical facility" and required the Secretary of Defense to "develop and implement a comprehensive master plan (CMP) to provide sufficient world-class military medical facilities and an integrated system of healthcare delivery for the NCR." The law specifically required the CMP to include a program to address facility requirements as identified by a facilities needs assessment. It also required the CMP to incorporate "all ancillary and support facilities at the National Naval Medical Center, Bethesda, Maryland, including education and research facilities as well as centers of excellence, transportation, and parking structures required to provide a full range of adequate care and services for members of the Armed Forces and their families."

In April 2010, the Deputy Secretary of Defense provided Congress with the required CMP, and a Supplement to the CMP in August 2010. Among other items, the CMP identified approximately $800 Million in post-BRAC facility projects (FY 2012 – FY 2018) required at Bethesda to achieve "world-class" facility standards. A WRNMMC Medical Facilities Master Plan was developed to further refine the facility projects discussed in the CMP and to ensure they fully met the intent of the law.

In addition to the CMP and WRNMMC Medical Facilities Master Plan, there are other efforts such as the 2011 Accessibility Plan to meet different and specific needs at NSA Bethesda. The Accessibility Plan was prepared to support NSA Bethesda's vital role in the care of wounded warriors and with the general goal of providing a universally accessible campus for its tenants. This study identified and quantified challenges to accessibility, developed a strategy for implementing universal accessibility, and provided recommendations for establishing accessible routes and zones within the campus.

Purpose and Need for the Proposed Actions

Medical Facilities Development

The purpose of the Medical Facilities Development is to implement the FY 2010 NDAA Congressional mandate to achieve the new statutory world-class standards for military medicine at WRNMMC. This would be accomplished by providing enduring facilities commensurate in quality, capability, and condition with those provided by the BRAC investment.

The Medical Facilities Development is needed because current space is insufficient to meet world-class standards such as: decompression to single occupancy patient rooms (converting semi-private rooms to single rooms), a state-of-the-art simulation center, and a health innovation center. It is important to reiterate that the Medical Facilities Development would enhance, support, and improve the quality of healthcare service delivery but not add to the mission of WRNMMC.

The purpose of, and need for, the Medical Facilities Development were identified subsequent to the programming for BRAC 2005. The BRAC 2005 construction was specifically designed to accommodate the transfer of WRAMC to WRNMMC and restricted BRAC funding to projects related to accommodating BRAC relocation. Therefore, parts of the medical center did not undergo renovation or improvement during BRAC construction because that program was never intended to address the mission capability or functionality of the existing infrastructure.

As discussed, the requirements identified for the Medical Facilities Development were initiated in the 2009 DHB study and culminated in the CMP and WRNMMC Medical Facilities Master Plan. The WRNMMC Medical Facilities Master Plan provides a long-range plan subsequent to BRAC 2005 construction and identifies facility, infrastructure, and technology requirements to achieve the goals of a world-class academic

medical facility, including the current military space standards (NAVFAC, 2011a). These recommendations would address the Joint Commission on Accreditation of Healthcare Organizations' hospital design standards. The WRNMMC Master Plan recommendations were made to meet several healthcare delivery objectives including: maintaining a focus on patient-centered care through adopting the medical home concept, expanding access to care, upholding high patient satisfaction, and focusing service and space on the wounded warrior population.

Based on the recommendations in the WRNMMC Medical Facilities Master Plan, the proposed Medical Facilities Development would provide required space in two categories: (1) right-sizing existing departments in the existing hospital to meet military standards, and (2) replacing existing facilities with new construction that meets current space and healthcare operational standards. These developments would decompress medical and support activities that currently operate in spaces that do not meet military standards. The Medical Facilities Development addresses the requirement to increase the number of private rooms for patient care. To accommodate the same number of beds in the new single patient configuration requires other departments to be relocated.

The Medical Facilities Development would allow space for in-fill development for consolidating units to better serve the patient population, such as a consolidated Women's Health Center. The development would also provide space for world-class features such as a state-of-the-art simulation center and a health innovation center.

To enhance the operations of WRNMMC, the Medical Facilities Master Plan proposes a parking garage for visitors, patients, and VIPs to serve the medical facilities and the overall unmet parking needs across NSA Bethesda. The 2008 Transportation Management Plan (TMP) calculated the NCPC-defined staff parking ratio (1:3) plus the Unified Facilities Criteria (UFC) non-staff parking needs equating to demand for 8,903 parking spaces. The current available parking at the installation is 7,686 spaces, which results in a 1,217-space deficit. The construction of the proposed parking garage would reduce the parking space deficit and still comply with the NCPC staff parking ratio.

As part of the Medical Facilities Development, the 2011 WRNMMC Medical Facilities Master Plan proposes several utility upgrades at NSA Bethesda. The purpose of the utility improvements is to support the healthcare delivery facilities at NSA Bethesda. The proposed utility improvements are needed because at the conclusion of the BRAC 2005 construction, utility capacity at NSA Bethesda was essentially at equilibrium, with only a small margin of excess capacity. The WRNMMC Master Plan concluded that any development of future facilities would require additional electrical capacity and that a large percentage of the utility services at NSA Bethesda are either nearing capacity or are in need of significant repair.

The purpose of the accessibility and appearance improvement projects is to provide accessible and aesthetically pleasing pedestrian pathways focused on wounded warriors, their special needs, and the staff helping them to adjust to their new challenges. These projects are needed because currently there are deficiencies in existing pathways or a lack of pathways that make areas of the installation inaccessible to wounded warriors and other disabled patients. These projects were based on the recommendations from the 2011 Accessibility Plan as well as the 2010 Installation Appearance Plan (IAP), which is the official direction and guidance for designing, developing, and reviewing all physical development (including new construction and exterior renovation) NSA Bethesda).

The purpose of the internal and external renovations to Building 13 is to convert the current storage facility to administrative space. Renovations to Building 13 are needed to provide a consolidated location for security services currently in dispersed space at NSA Bethesda. The renovations are also needed to provide permanent space for the staff currently in temporary trailer space.

University Expansion

The primary purpose of the University Expansion is to provide adequate education and research space to meet MHS commitments to deliver training and post-graduate level education to the military medical community and enable USU to serve as the core academic health research center at WRNMMC (USU, 2010). USU is the academic locus of MHS and its product lines impact every face of the healthcare delivery in MHS. The purpose of the University Expansion is also to address the most recent Liaison Committee on Medical Education (LCME) accreditation requirements that entail the institution providing additional space for student-centered learning, small-group teaching, and technological innovation (USU, 2010).

The University Expansion would allow classroom and laboratory space increases and would support LCME requirements for class size, research space needs, and accommodate the consolidation of dispersed off-site functions. The University Expansion would directly support strategic alignment within MHS by improving efficiency in teaching medical, nursing, and biomedical science students; producing research; and augmenting WRNMMC as a world-renowned biomedical research, education, and patient care facility (USU, 2011).

The University Expansion is needed because USU operations such as the Center for Disaster and Humanitarian Medicine, Center for Study of Traumatic Stress, Center for Neuroscience and Regenerative Medicine, Center for Prostrate Disease Research, Tri-Service Nursing Research Program, National Center for Disaster Medicine and Public Health and National Capital Area Simulation Center are currently dispersed between the main USU buildings and 19 facilities comprising off-site leased locations in Montgomery County, Maryland and other dispersed buildings on NSA Bethesda. The Capital Investment Review Board

concluded that relative to programmatic growth at the School of Medicine, other than the Graduate School of Nursing, there has been a lack of major capital investments at USU since its establishment. This lack of major capital investment has resulted in an aging and inadequate infrastructure and dispersed operational spaces that constrain optimal performance as an integrated medical education and research delivery activity (USU, 2010). The expansion is needed because there is no capacity within the boundaries of the existing USU campus and the institution must continue to attempt to meet its mission with dispersed operations. The expansion is also needed to provide the education space to meet the most recent LCME class size requirements. These requirements cannot be achieved with the current classrooms because they were built under past size requirements that did not emphasize small-group teaching and current technological innovation. The expansion is needed to allow students and staff unfettered access to the primary assets of USU, its people, and interactions available on campus.

Proposed Actions and Alternatives

Proposed Actions and Alternatives – Medical Facilities Development

The Medical Facilities Development is the result of an iterative planning process, including the CMP and the WRNMMC Master Plan. The planning process identified and evaluated alternatives based on the departmental needs anticipated at WRNMMC after the completion of BRAC-mandated relocations in September 2011. The CMP development process identified the proposed action as the best approach to meet the Congressional mandate for world-class facilities commensurate in quality, capability, and condition with the BRAC investment. To fulfill these facilities requirements, NSA Bethesda proposes to demolish existing space and construct new medical facilities as identified below (see Figures ES-1 and ES-2). Demolitions and interior construction activities would require the temporary displacement of existing occupants; the occupants would be accommodated in temporary facilities or other existing facilities on the installation until the permanent facilities are completed.

- Demolition of Buildings 2, 4, 6, 7, and 8 of the main hospital complex comprising approximately 326,000 square feet (SF) would occur. These buildings currently house the following services:
    - clinical including the dental readiness clinic, infectious diseases, and vision center;
    - education including USU, Navy Medicine, Personnel, Training and Education Command, and Simulation Center; and
    - support including public areas, biomedical repair, chaplain, and trauma services.

These services would be relocated to the temporary medical facilities (see below) until the permanent facilities are constructed.

Figure ES-1: Proposed Medical Facilities Development and University Expansion and Alternatives

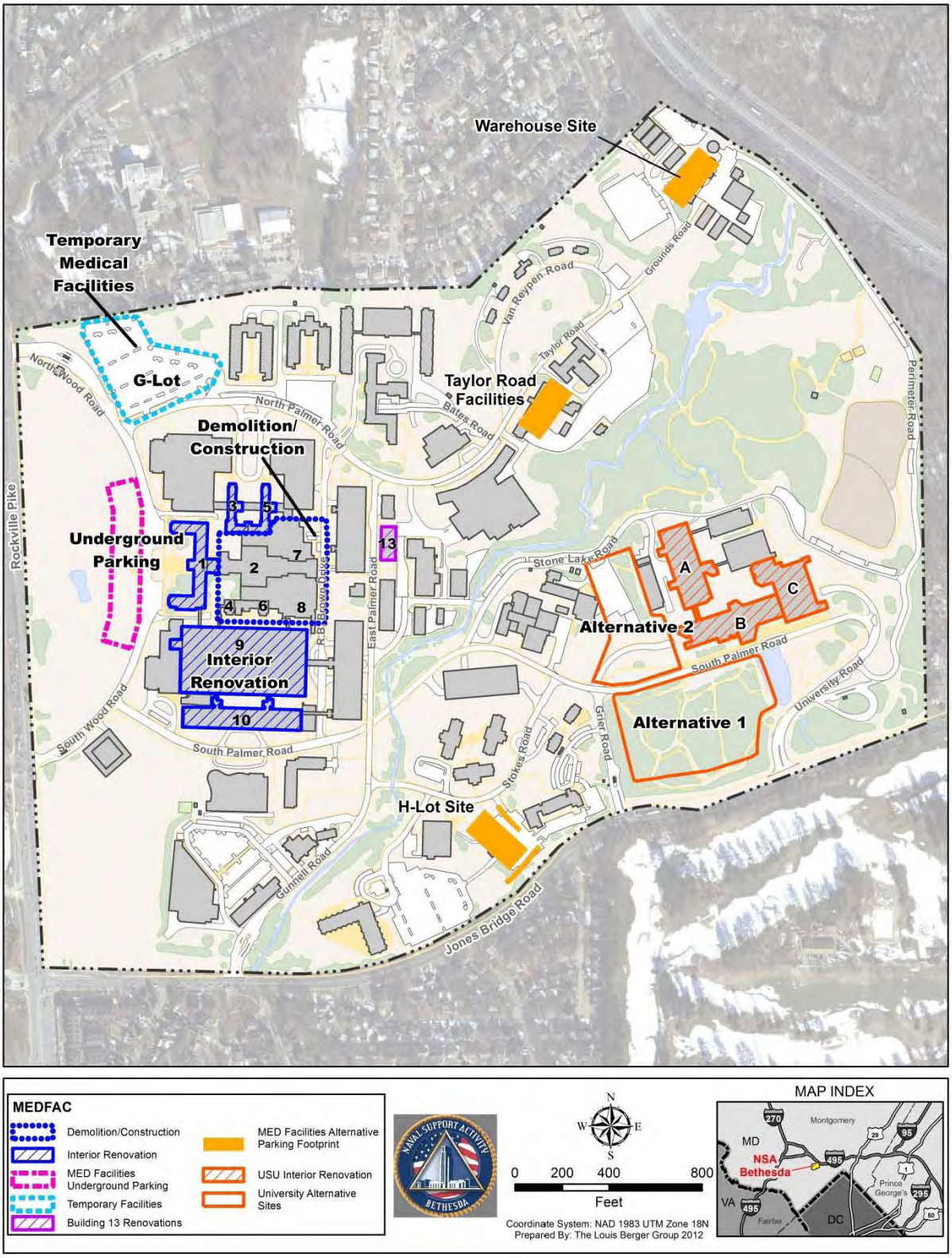
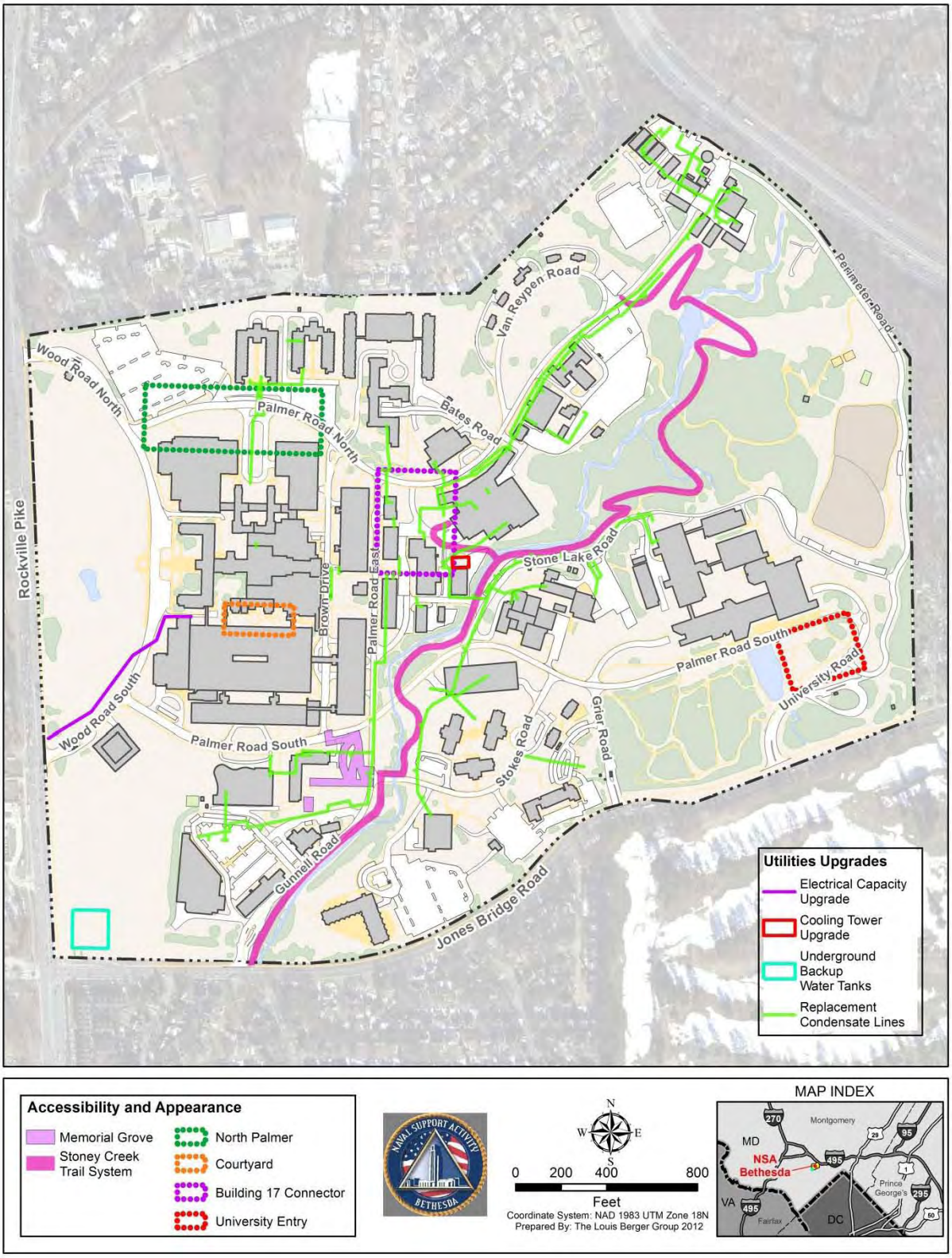


Figure ES-2: Proposed Utilities Upgrades and Accessibility and Appearance Improvements



- Construction of Building C: A 5-story, 573,000 SF single facility (five levels of finished area above grade and one basement level). The new construction would be in the same basic footprint of the demolished facilities and would be generally consistent with the height of the tallest building to be demolished. The new construction would mostly house the departments from the buildings to be demolished. The relocations to the new construction would right-size (or provide optimal space) for the existing departments. It would also provide space for departments that would be relocated from buildings to be renovated such as Labor/Delivery/Recovery/Postpartum, Neonatal Intensive Care Unit, and Ambulatory Surgery from Building 10. Some program components, such as those located in Building 9 and associated with women's healthcare (such as Urology/Gynecology and Obstetrics/Gynecology) would be relocated to Building C along with Labor/Delivery/Recovery/Postpartum and Neonatal Intensive Care Unit, all forming a new, concentrated women's healthcare center. This movement of departments and clinics open up available backfill spaces that would relieve spatial pressures elsewhere and provide complementary functions to existing clinics. The new construction would also accommodate program requirements such as a state-of-the-art simulation and education center, a health innovation center, and an hourly child care drop-off center.

  It should be noted that the official name of Building C has been changed recently to the Medical Center Addition and Alterations (MCAA), however, for the purposes of the EIS, it is referred to as Building C.

- Medical Facilities Interior Renovation: Approximately 120,000 SF of currently occupied space in the interiors of Buildings 1, 3, 5, 9, and 10 would be renovated. The renovations include: conversion of spaces vacated by the relocation of existing departments to the proposed Building C to new single-patient rooms; construction of adjacencies and connections between the neighboring buildings and the proposed Building C, and projects such as roof replacements, mechanical upgrades, elevator repairs, and replacement of door hardware.

- Construction of Temporary Medical Facilities at G-Lot: Construction of approximately 100,000 SF of temporary medical facilities and provision of utilities would occur to provide uninterrupted patient services during construction and renovation. Once the temporary facilities are no longer needed, they would be removed and G-Lot would be converted back to a parking area with the current number of parking spaces.

- Construction of Parking Structure: The proposed action would construct an approximately 225,000 SF, 500-space underground parking garage west of Building 1 to serve the medical facilities and the overall unmet parking needs across NSA Bethesda. For the

underground garage, two options are under consideration for vehicle ingress/egress: 1) G-Lot: vehicles would enter G-Lot and access the garage via descending ramps underneath North Wood Road, and 2) Wood Road: vehicle ingress/egress points within the current limits of Wood Road at symmetrical locations flanking the Building 1 terraces.

To fulfill the parking facility requirement, NSA Bethesda identified three above-ground sites as alternatives to the underground parking garage. The three sites are: the warehouse area in the northeast corner of the installation, Taylor Road Facilities in the northeast area, and H-Lot in the south area. Constructing an above-ground parking garage at the warehouse area would require demolition of Buildings 80 (public works shop), 149 (pavement and garden sheds), 152 (general purposed warehouse), 101 (pavements and garden sheds), and 99 (filling station). Functions of these buildings would be relocated to existing facilities on the installation. However, detailed site planning for these projects has not occurred; therefore, specific relocation sites are unknown at this time. Any relocation of these functions would occur within existing infrastructure inside the fence line of NSA Bethesda and would have no impact on the surrounding community.

Constructing an above-ground garage at Taylor Road would require demolition of Buildings 28 (administrative office), 53 (Environmental Health Effects Office), and 59 (USU Environmental Laboratory). Staff and functions from those buildings would be relocated to existing facilities on the installation.

- Utilities Upgrades: The Medical Facilities Development would involve the following utility upgrades:

    - Demolish and reconstruct three existing cooling towers and construction of a fourth tower, with each tower providing approximately 13,000 gallons per minute (gpm) of chilled water capacity. Construction would include five condenser water pumps, each with an approximate capacity of 9,720 gpm.

    - Replace deteriorating condensate return lines across the installation.

    - Repair damaged water lines.

    - Provide backup water supply storage tanks and distribution lines for the installation.

    - Double the number of the high voltage feeder lines from Potomac Electric Power Company’s Woodmont substation and increase the installation capacity to 51 mega-volt amperes.

- Accessibility and Appearance Improvements Projects: The Medical Facilities Development includes six of the projects defined in the 2010 IAP. Two of the projects were further refined in the 2011 Accessibility Plan. These projects primarily address aesthetic and functional enhancements for high-profile areas of the installation. The six projects involve improvements to existing infrastructure including widening/realigning sidewalks, installing directional indicators and guides, and additional landscaping. These projects are:

    - North Palmer Road – This project focuses on the areas immediately around Buildings 11, 60, 61, and 62, north of North Palmer Road. It also includes areas adjacent to Building 1.

    - Courtyard – This project would add a variety of plantings for color, texture improvements, and green screens along the exterior walls to enhance the area.

    - Memorial Grove – This project would address the severe grade transition from South Palmer Road to East Palmer Road. This area is critical for continued accessibility to the Fisher Houses, Navy Lodge, and Bowling Center because the existing sidewalks associated with the bridges along South Palmer Road are not considered accessible.

    - Building 17 Connector – This project would provide a pedestrian pathway to the Fitness Center, JTF, Flag Officer Quarters, and the future Sanctuary Hall and United Service Organization (USO) facilities.

    - University Entry – This project would provide additional flowering azaleas along the section of University Road near the pond to improve the appearance of this area.

    - Stoney Creek Trail System – This project would provide a fully accessible, 6-foot wide, asphalt trail that never slopes more than 5 percent and would generally follow the footprint of the existing trail, limiting the amount of associated tree clearing. This project would include one existing and one new bridge over Stoney Creek.

- Building 13 Renovations – The Medical Facilities Development would include internal and external renovations of Building 13 and would convert the current storage facility to administrative space. The 2-story building has an area of approximately 18,000 SF (within an approximately 9,000 SF footprint). External renovations would include windows/garage door replacements and trimming of the existing loading dock.

- Construction Material Storage – As shown in Figure ES-3, three areas at NSA Bethesda have been identified as potential locations for construction storage and staging, including: 1) ball field areas in the east; 2) N-lot during 2013-2015; and 3) the area between the helipad and the Navy Exchange towards the southwest.

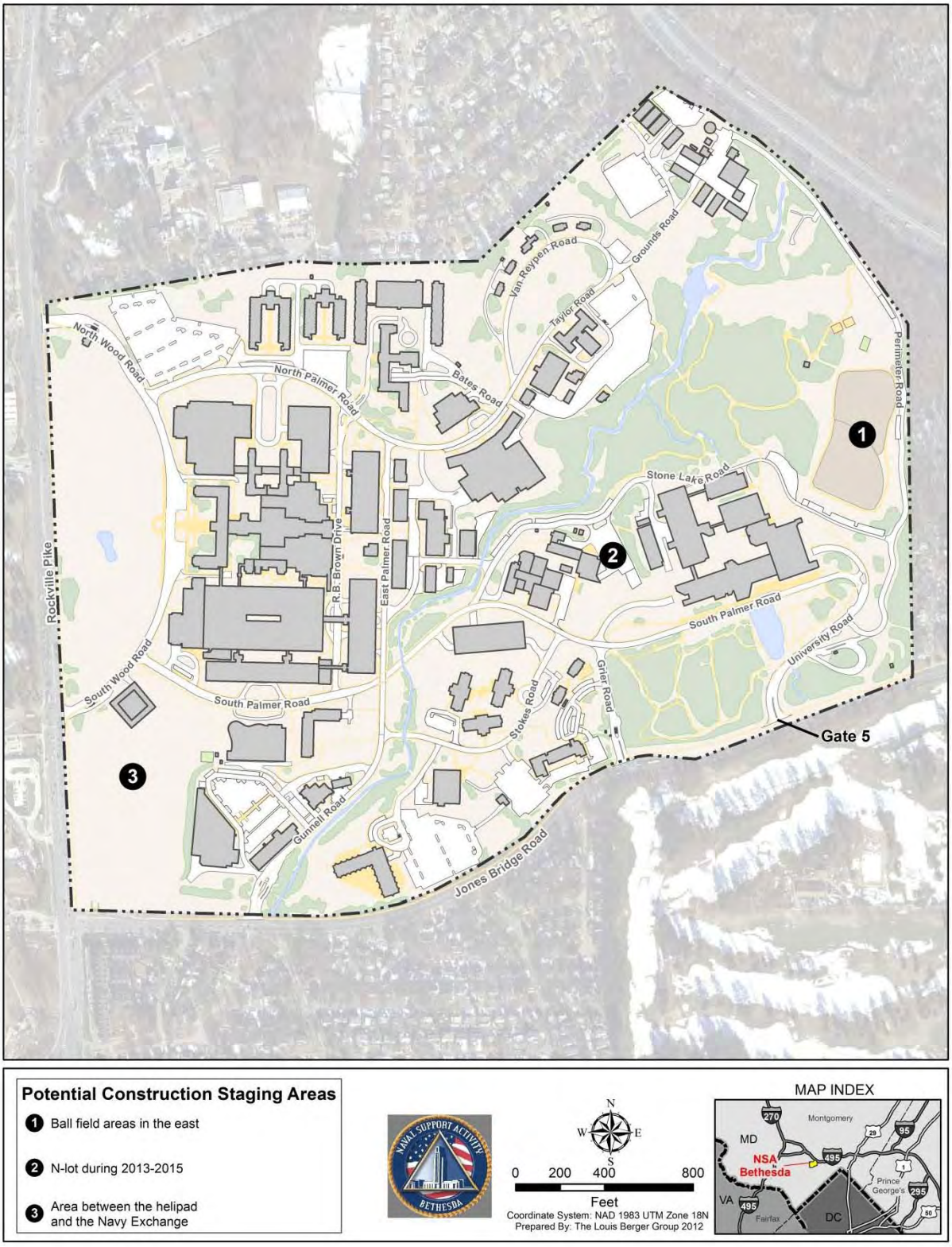
  Construction material would be stored within the staging areas to the extent practicable. During construction, the N-Lot parking spaces will be lost and will be converted back to a parking lot once construction is completed. If there is not sufficient room, the contractor would be required to coordinate delivery of equipment/supplies as needed. The University Gate (Gate #5) with the commercial vehicle inspection facility (CVIF) would provide primary access to the construction storage and staging sites. The Medical Facilities Development incorporates DoD Anti-Terrorism/Force Protection (AT/FP) standards in accordance with DoD Minimum Antiterrorism Standards for Buildings UFC 4-010-01 (February 2012) to the maximum extent practicable. Access to all facilities would comply with Americans with Disabilities Act (ADA) and Architectural Barriers Act Accessibility Guidelines.

The Energy Policy Act of 2005 (EPAct 2005), Energy Independence and Security Act of 2007 (EISA 2007), and Executive Orders (EOs) 13514 and 13423 require the installation to adhere to sustainable principles. Leadership in Energy and Environmental Design (LEED®) Silver features would be integrated into the design, development, and construction of the projects. The construction of Medical Facilities Development would comply with the Low Impact Development (LID) requirements adopted by the Navy to the greatest degree possible.

The Medical Facilities Development is anticipated to increase approximately 50 support staff at WRNMMC with no increase in patients and visitors. This is because the proposed action would right-size existing facilities to world-class standards and would not change its mission or function. The current estimated construction phases for the Medical Facilities Development are as follows: Accessibility and Appearance Projects (February 2013-August 2014), Electrical Upgrades (May 2013-January 2015), Temporary Medical Facilities (August 2013-October 2014), Mechanical (December 2013-August 2015), Parking Garages (December 2013-December 2015), and Building C (October 2014-October 2018; Building 13 renovations are expected to occur within the same timeframe as Building C but would be of shorter duration).

The proposed action for Medical Facilities Development is the preferred alternative and its implementation would require an estimated 6-year construction period in total for the various components.

Figure ES-3: Construction Staging Areas



No Action Alternative – Medical Facilities Development

The No Action Alternative would not allow the demolition of Buildings 2, 4, 6, 7, and 8 or the construction of Building C. Interior renovations in Buildings 1, 3, 5, 9, and 10 would not occur. Therefore, the No Action Alternative would not provide WRNMMC with modern, improved right-sized facilities to accommodate the DoD healthcare mission, including the attributes of the new statutory, world-class standards for military medicine as mandated by 2010 NDAA.

Under the No Action Alternative, the associated infrastructure upgrades, including: demolishing three and constructing four cooling towers; replacing deteriorating condensate return lines across the installation; repairing damaged water lines, constructing backup water supply storage tanks and distribution lines within the installation; and upgrading electrical capacity would not occur. In addition, a new parking structure would not be constructed. Therefore, the capacity of the installation's utilities would not increase and the installation would be unable to meet demands of future development or unmet parking needs. Under this alternative, the accessibility and appearance projects would also not be constructed; therefore, portions of the installation would continue to be inaccessible to wounded warriors and other disabled patients.

Under the No Action Alternative, Building 13 would not undergo interior/exterior renovation and a consolidated location for NSA Bethesda security services would not be provided.

Proposed Actions and Alternatives – University Expansion

The proposed University Expansion entails constructing a new education and research building, Building F. The University Expansion is primarily for consolidating the dispersed 19 departments, centers, and activities dispersed in aging and inadequate spaces at NSA Bethesda or in off-campus leased space in Montgomery County, Maryland. The consolidation would result in termination of the current lease agreements. Building F would also provide space and infrastructure required to meet the most recent LCME accreditation requirements and Military Health System commitments.

The University Expansion would also include an above-ground parking structure to accommodate the consolidation of 220 staff from off-site. The parking structure would accommodate these displaced lots and overall staff at NSA Bethesda (per the 2008 TMP parking requirements, the installation currently has a deficit of approximately 1,217 spaces). Additionally, the University Expansion includes renovation and modernization of administrative and educational space and the ground floor in the existing University Buildings.

The University Expansion incorporates DoD AT/FP standards in accordance with *DoD Minimum Antiterrorism Standards for Buildings UFC 4-010-01* to the maximum extent practicable. Access to all the

facilities would comply with ADA and Architectural Barriers Act Accessibility Guidelines.

The EPAct, EISA, and EOs 13514 and 13423 require the installation to adhere to sustainable principles. LEED® Silver features would be integrated into the design, development, and construction of the projects, and the projects would comply with LID requirements adopted by the Navy.

To implement the University Expansion, NSA Bethesda has identified two alternative sites: Alternative 1 located south of the existing USU campus in the wooded lot east of Grier Road, and Alternative 2 located west of the existing USU campus in the area between USU and Armed Forces Radiobiology Research Institute (AFRRI). Alternative 2 is the preferred alternative. Under either alternative site, the proposed University Expansion would entail the construction of a new, approximately 341,151 SF education and research building (Building F), and an approximately 144,000 SF, 400-space above-ground parking structure. Under Alternative 1, Building F and the above-ground parking garage would be separate buildings and under Alternative 2, Building F would be located on top of the parking garage. Under both alternatives, the University Expansion includes renovation and modernization of approximately 39,000 SF of administrative and educational space and the ground floor in the existing University Buildings (Buildings A, B, and C).

Under either University Expansion alternative, approximately 220 incoming staff from off-base facilities would be consolidated at NSA Bethesda. These personnel are already part of the institution in the area and currently travel back and forth to the installation. No increase in student population is anticipated because the University Expansion would consolidate already existing activities that are dispersed in various locations on- and off-base.

The current estimated construction dates for the University Expansion, Building F, and above-ground parking garage are in 2017-2018 timeframe. The University Expansion would use the same three construction staging and storage locations identified for the Medical Facilities Development. However, if University Expansion Alternative 2 is selected, N-Lot would not be available for the entire construction duration, since a building would be constructed at that site. N-Lot would be utilized as a staging area while construction occurs in other areas; equipment would be consolidated at the other two locations. If University Expansion Alternative 2 is selected, the lost N-Lot spaces will be provided in the new USU parking garage. If University Expansion Alternative 1 is selected, N-Lot will be converted back to a parking lot. The University Gate (Gate #5) with the commercial vehicle inspection facility (CVIF) would provide primary access to the construction storage and staging sites.

Implementation of the University Expansion would require an estimated 2-year construction period for Building F and the parking garage for either of the alternative sites.

No Action Alternative – University Expansion

The No Action Alternative would not allow for the construction of Building F and the parking facility. The institution would continue to operate sub-optimally in 19 dispersed departments, centers, and activities dispersed in inadequate and temporary spaces at NSA Bethesda or in off-campus leased locations in Montgomery County, Maryland. Under the No Action Alternative, LCME accreditation of the University would be in jeopardy, and the institution would not be able to provide adequate education and research space to meet its Military Health System commitments.

Environmental Consequences by Resource Area

Major issues and impacts associated with the Medical Facilities Development and University Expansion are discussed below and presented in Tables ES-4 and 5. The No Action Alternative would not implement either proposed actions. Neither demolition/construction nor renovation would occur, and staffing at NSA Bethesda would not change. The majority of the potential impacts are associated with construction and demolition activities rather than operation of the proposed facilities. Therefore, this section only includes a discussion of operational impacts if any are anticipated.

Geology and Topography - Medical Facilities Development

Construction and demolition related to Building C and the above-ground parking garage alternatives would be mostly within developed areas; therefore, impacts on geology and topography are not anticipated. Excavation of approximately 18,810 cubic yards would be needed to prepare the foundation for Building C.

Constructing underground parking requires excavating approximately 27,400 cubic yards of rippable rock to accommodate the parking garage at approximately 260 to 270 feet below ground. Construction would be conducted in accordance with Federal, state, and local safety regulations. The underground parking garage would interact with a shallow aquifer in the area, and permanent dewatering would be required once the parking lot becomes operational. Groundwater at NSA Bethesda occurs at a depth ranging from 10 to 50 feet below the ground surface, but a hydrological investigation conducted in 2011 in the vicinity of the proposed location for the parking garage found groundwater levels were greater than 30 feet. Lake Eleanor, the perennial pond west of the construction site, and its source spring would not be affected. The lawn above the proposed underground garage would be restored after construction to similar topography; impacts would be minimal.

Some excavation would be needed for the above-ground parking garage alternatives: approximately 670 cubic yards for the warehouse area parking garage; approximately 630 cubic yards for the H-Lot parking garage, and similar excavation for the Taylor Road Facilities parking garage. Significant impacts to topography and geology are not anticipated.

No impacts on geology or topography are anticipated for the internal renovations because no ground work is required.

Minimal impacts are anticipated for the temporary medical facilities because they would be located on G-Lot, which is already disturbed. Temporary and minimal impacts on soils would occur as a result of digging a trench for utility lines for the temporary medical facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched; however, impacts on geology or topography are not anticipated.

Under the utilities upgrades, trenching for utility line upgrades would occur but there would not be impacts on geology or topography (approximately 50,792 SF or 1.17 acres would be trenched). Back-up water supply storage would require installing four 50,000-gallon underground water storage tanks, each tank approximately 13 feet wide by 52 feet long. Approximately 1,020 cubic yards of soil would need to be excavated to install the tanks. Disturbance of bedrock would not be likely, and topography would not change noticeably. Demolition, construction, and replacement of the three cooling towers, and construction of a fourth cooling tower would require minimal excavation on already disturbed or mostly disturbed land and would not result in impacts on geology or topography. Excavation of approximately 300 cubic yards would be required.

The majority of the accessibility and appearance improvement projects would not impact geology or topography, because they would involve enhancements to existing infrastructure. Landscaping projects involving planting new vegetation would not extend substantially below the ground surface and would therefore not affect geology or topography. Intense, localized grading would be required for portions of the Stoney Creek Trail System. Some areas of the Stoney Creek Trail System, particularly on the north end, would be located on 15 percent or higher slopes and would require intensive, localized grading to level the slopes to not more than 5 percent, and stabilization, such as retaining structures (for example, riprap supported by concrete holdings) for their development. Two bridges over Stoney Creek would require limited excavation including driving piles into the soil. The total estimated amount of excavation needed for all of the accessibility and appearance improvements projects is approximately 450 cubic yards.

External renovations to Building 13 would involve minimal ground disturbance within the area of the existing structure, and excavation

of approximately 110 cubic yards of soil would be required. There would be no impacts on geology or topography.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Therefore, there would be no impacts on geology or topography.

Soils - Medical Facilities Development

Construction of Building C would be within the approximate footprint of the buildings to be demolished (Buildings 2, 4, 6, 7, and 8) that currently occupy approximately 2.8 acres of impervious area. Building C would result in 2.6 acres of impervious surface, thus reducing impervious surface by 0.2 acre. Excavation of approximately 18,810 cubic yards would be required for the Building C foundation. The demolitions would require removal of one underground storage tank (UST) and one daytank; if any contaminated soils are discovered during the removal process, it would be remediated in accordance with Federal and state regulations (see also Human Health and Safety).

Construction of the underground parking garage would require disturbance of approximately 112,500 SF (2.6 acres). The underground parking requires excavation of approximately 27,400 cubic yards of rippable rock. Soils beneath the parking garage would be subject to compaction as a result of the construction. Surface soils would be replaced after construction that would restore the Front Lawn of Building 1 to natural conditions.

The impervious areas resulting from the above-ground parking garage alternatives, the warehouse area, H-Lot, and Taylor Road Facilities, would be approximately 29,200 SF (0.68 acre), 39,100 SF (0.9 acre), and 28,450 SF (0.65 acre), respectively. These sites are in mostly developed areas; therefore, the soils have already been subject to disturbance and compaction and impacts would be minimal. Excavation would be required, as described under Geology and Topography.

Temporary and minimal impacts on soils would occur as a result of digging a trench for utility lines for the temporary medical facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched. No impacts are anticipated for the internal renovations because no ground work is required.

For the utilities upgrades, 0.6 acre of impervious surface would cover the area where the backup water tanks would be buried. Approximately 1,020 cubic yards of soil would need to be excavated to install the tanks. Approximately 9,255 linear feet, or an area of 37,020 SF (0.85 acre) of soil would be trenched to upgrade or replace the existing condensate utility lines. Approximately 2,463 linear feet, or an area of 9,848 SF (0.23 acre) of soil would be trenched for the water line connection between the proposed backup water tanks and Building 16. An additional 980 linear feet, or 3,920 SF (0.09 acre) would be trenched

for electrical upgrades. The soils from trenching would be returned once the construction activities are completed. Approximately 4,450 SF (0.1 acre) of soil would be disturbed in association with the demolition and replacement of the cooling towers, and excavation of approximately 300 cubic yards would be required.

The accessibility and appearance improvement projects are mostly improvements to existing infrastructure; therefore, impacts on soils would be minimal. Addition of new landscaping would disturb soils temporarily. The Stoney Creek Trail System project would require intense, localized grading at some portions, as described previously. Construction of a new foot-bridge and replacement of an existing bridge over Stoney Creek would disturb and compact soil under the foundations of these bridges. The total estimated amount of excavation needed for all of the accessibility and appearance improvements projects is approximately 450 cubic yards.

Minimal impacts on soils would result from the external renovations of Building 13 because there would be minimal ground disturbance within the area of the existing infrastructure. Excavation of approximately 110 cubic yards would be required.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, and erosion and sediment control measures would be implemented while the areas are operational. Impacts on soils would be temporary because the areas would be restored to original conditions after construction is completed.

Construction projects with more than 5,000 SF of earth disturbance require an approved erosion and sediment control plan, consistent with Maryland’s most current erosion and sediment control guidelines, and stormwater management (COMAR 26.17.01 and 26.17.02). Prior to construction at any site, a General Permit for Construction Activity would be obtained that includes an approved sediment and erosion control plan. This plan would include site-specific Best Management Practices (BMPs) for controlling runoff, erosion, and sedimentation during construction and demolition activities. Site-specific BMPs would be developed based on proper design, runoff calculations, slope factors, soil type, topography, construction activities involved, and proximity to waterbodies. As part of these BMPs, NSA Bethesda would implement sedimentation and erosion control measures to retain sediment generated by land-disturbing activity within the boundaries of the construction area. BMPs could include, but are not limited to, protective devices preventing surface drainage flows, erosion control matting, rip-rap, and sediment traps. The application of any or all of these BMPs, or other appropriate BMPs, would depend upon precise, specific ground conditions in the areas disturbed by construction. Because the amount of disturbed ground would exceed 1 acre, a National Pollutant Discharge Elimination System permit would be required.

Sustainable principles of EPAct 2005 and LEED® Silver features would be integrated into the design, development, and construction of the Medical Facilities Development and coordinated to the degree practical with LID requirements adopted by the Navy.

Areas disturbed as a result of the new construction would be aerated and reseeded or replanted with native vegetation and/or re-sodded following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity.

The proposed construction and demolition activities under the Medical Facilities Development could encounter contaminated soils associated with USTs; if any contaminated soils are discovered during the removal process, it would be remediated in accordance with Federal and state regulations.

With soil erosion and sediment control measures and adherence to all applicable safety regulations, the actions proposed under this alternative would result in minor adverse soils impacts from construction occurring in open areas.

Geology and Topography – University Expansion

University Expansion – Alternative 1: This site contains steep topography, with the western half of the site containing slopes steeper than 15 percent. The eastern side, although not as steep, still has slopes at 5 to 15 percent. Construction of the new facility and parking garage would require extensive grading and cut and fill, resulting in noticeable changes to topography. Impacts on geology would not be noticeable because it is not likely that excavation of bedrock would be necessary. Additionally, the compaction of previously non-compacted soils is not expected to be significant under this alternative because most of the soil on this site has been extensively disturbed during construction of the nearby buildings, trails, and pond located adjacent and east of the site (many of the hills are actually spoil piles). Approximately 1,115 linear feet, or an area of approximately 4,460 SF (0.1 acre) would need to be trenched for associated utilities upgrades, but there would be no impacts on geology or topography. The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Therefore, there would be no impacts on geology or topography.

University Expansion – Alternative 2: This site is relatively flat and currently developed, although there is a narrow, steep slope of approximately 10 to 15 percent between the existing USU campus and the site. Less extensive grading would be needed at this site compared to the Alternative 1 site because a majority of the site has been previously graded to support the existing parking lot, resulting in minimal impacts on topography. Approximately 500 linear feet, or an area of approximately 2,000 SF (0.05 acre) would need to be trenched

for associated utilities upgrades, but there would be no impacts on geology or topography. Under Alternative 2, the three areas proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Therefore, there would be no impacts on geology or topography.

Soils – University Expansion

All construction activities associated with the University Expansion would include measures for sediment and erosion control, and would comply with applicable regulations to minimize erosion and other impacts on soils.

University Expansion – Alternative 1: Most of the site for Alternative 1 is presently forested with some trails. Construction of the new facility and parking garage would require extensive grading and cut and fill, resulting in disturbance and compaction of a large amount of soil. Approximately 85,250 SF (1.96 acres) would be disturbed to construct the facility, and an additional 36,000 SF (0.83 acre) would be disturbed for the parking garage, for a total of approximately 121,250 SF (2.8 acres). Approximately 1,115 linear feet, or an area of approximately 4,460 SF (0.1 acre) would need to be trenched for associated utilities upgrades, but impacts would be temporary. Impacts on soils from the temporary construction material storage would be the same as described for the Medical Facilities Development.

University Expansion – Alternative 2: The site for Alternative 2 is relatively flat and already contains a developed parking lot, N-Lot, and would therefore require only some grading and excavation. Additionally, the footprint of the disturbed area under this alternative would be approximately 70,500 SF (1.6 acres) because Building F would be constructed over the parking garage. Approximately 500 linear feet, or an area of approximately 2,000 SF (0.05 acre) would need to be trenched for associated utilities upgrades, but impacts on soils would be temporary. The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Impacts on soils from the temporary construction material storage would be the same as described for the Medical Facilities Development, except that N-lot would not be used for the entire construction duration.

Water Resources – Medical Facilities Development

Construction of Building C would result in 2.6 acres of impervious surface and represent a decrease of 0.2 acre from the 2.8 acres of impervious surface covered by the buildings to be demolished. This decrease in impervious surface would provide beneficial impacts by decreasing both the volume of stormwater runoff and the amount of sediments and pollutants potentially transported to nearby surface

waters. There would be no significant impacts to groundwater, and no impacts to floodplains or wetlands.

Underground parking garage construction would require temporary disturbance of approximately 2.6 acres in the Front Lawn of NSA Bethesda. However, the area would be returned to a landscaped state after construction activities are completed. The underground parking garage would interact with a shallow aquifer in the area, and permanent dewatering would be required. Groundwater at NSA Bethesda occurs at a depth ranging from 10 to 50 feet below the ground surface, but a hydrological investigation conducted in 2011 in the vicinity of the proposed location for the parking garage found groundwater levels were greater than 30 feet. Lake Eleanor, the perennial pond west of the construction site, and its source spring would not be affected. There would be no impacts to floodplains or wetlands.

Footprints for the above-ground parking garage alternatives at the warehouse area, H-Lot, and Taylor Road Facilities, would be approximately 0.68 acre, 0.9 acre, and 0.65 acre, respectively. The potential for runoff of oil, grease, and antifreeze would be minimized during the operation of the parking facilities by following BMPs and standard operating procedures (SOPs) with planning and stormwater management improvements. There would be no significant impacts to groundwater and no impacts to floodplains or wetlands.

Internal renovations would not affect water resources. Construction of the temporary medical facilities on G-Lot would impact approximately 3.4 acres; however, there would be no net increase in impervious surfaces. There would be no impacts to groundwater, floodplains, or wetlands.

For the utilities upgrades, there would be a net increase in impervious surfaces of approximately 0.6 acre from some building demolition and construction, upgrades to the electrical distribution system, and the replacement condensate return lines and backup water supply tanks. No new component of the utilities upgrades would be within the 100-year floodplain. There would be no impacts to groundwater or wetlands. Sections of the existing lines would be replaced in the same location and would not result in significant impacts to water resources.

The accessibility and appearance improvement projects would contribute to a net increase of approximately 0.14 acre of impervious area (-0.13 acres for North Palmer Road; -0.24 acres for the Courtyard; -0.24 acres for Memorial Grove; 0.01 acres for the Building 17 Connector; 0.17 acres for the University Entry, and 0.57 acre for Stoney Creek improvements). Except for portions of the Stoney Creek Trail System improvements described below, none of the improvement projects would occur within proximity to any surface water features on NSA Bethesda. While the Stoney Creek Trail System improvements would result in new pavement being constructed, it should be noted that pervious pavement would be utilized, which would reduce impacts from runoff. As

previously described, the Stoney Creek Trail would be on average, 6 feet wide. There would be no significant impacts to groundwater from the accessibility and appearance improvement projects.

Portions of the Stoney Creek Trail System improvements, including the new bridge, would be constructed in the 100-year floodplain of Stoney Creek; however, it is important to note that no developed area of NSA Bethesda is located within a Federal Emergency Management Agency (FEMA) regulated 100-year floodplain (FEMA, 2011). While not FEMA regulated, Stoney Creek's 100-year floodplain was modeled in 1998 (NNMC, 2000). Approximately 0.11 acre of the trail improvements would occur along Stoney Creek in the vicinity of the areas that are considered to be potential wetlands (see Figure 3-3 of the EIS). However, the final design layout and construction of the trail improvements in these areas would seek to avoid those areas to the maximum extent possible. If the areas cannot be avoided, a wetland investigation would need to be conducted to determine if the areas are wetlands. If impacts on wetland areas cannot be avoided, then the Navy would coordinate with the U.S. Army Corps of Engineers and comply with DoD's no net loss policy through participation in an approved off-site mitigation bank or in-lieu fee, according to permit requirements.

External renovations to Building 13 would result in minimal ground disturbance within the area of the existing structure. Proper controls would be implemented to control sedimentation and other pollutants; therefore, impacts on surface water would be minimal. There would be no impacts on groundwater, floodplains, or wetlands.

The areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, but no new impervious surfaces would be introduced. Erosion and sediment control measures would be implemented to minimize impacts from stormwater runoff. Impacts would be temporary because the areas would be restored to original conditions after construction is completed. There would be no impacts to groundwater, floodplains, or wetlands.

Water Resources – University Expansion

University Expansion – Alternative 1: This alternative would convert approximately 2.8 acres of pervious areas into impervious surfaces. Impacts on Stoney Creek would be minimized because Stoney Creek is located approximately 600 feet to the north of the project site and is topographically separated from the project site. However, University Pond, which is an ornamental pond, is located adjacent and to the east of the project site and there is no topographic separation between University Pond and this alternative site. University Pond is approximately 0.5 acre and contains 0.03 acre of non-persistent palustrine emergent wetland along the northeastern edge of the pond.

The increase in impervious surface could increase both the volume of stormwater runoff and the amount of sediments and pollutants transported offsite. However, the LID required by the new stormwater regulations is intended to minimize impacts occurring as a result of impervious footprints. Stormwater controls would also be implemented for the proposed action. University Pond could also be used as a stormwater control for the new site. However, use of this basin to accommodate runoff from the site would have to be specifically considered during the Maryland Department of the Environment (MDE) permitting process.

Increases in parking once the facilities become operational would increase the amount of oil, grease, and antifreeze that could be carried into the waters through runoff, affecting the water quality of Stoney Creek. However, the potential for runoff of oil, grease, and antifreeze would be minimized by following BMPs and SOPs with planning and stormwater management improvements.

The conversion of forested area to impervious surfaces would permanently impact the previously undisturbed infiltration area. However, NSA Bethesda would ensure that precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system.

This alternative site is not located within the Stoney Creek floodplain. An approved sediment and erosion control plan and stormwater BMPs would reduce runoff and potential pollutants carried to University Pond, preventing any potential impacts on the wetland on the northeast side of the pond.

Impacts on water resources from the temporary construction material storage would be the same as described for the Medical Facilities Development.

University Expansion – Alternative 2: The total net increase in impervious surface area under this alternative would be between approximately 0.6 and 1.6 acres. N-Lot and other developed areas consisting of 1 acre exist on the site (e.g., sidewalks). University Expansion Alternative 2 would occupy the entirety of the parking lot. This site is located less than 200 feet south of Stony Creek; therefore, NSA Bethesda would ensure strict adherence to the BMPs and SOPs with planning and stormwater management improvements to minimize direct impacts on surface waters. These impacts are anticipated to be minor. The proposed construction activities, the increase in impervious area, and new parking facilities would all generate small quantities of pollutants such as petroleum, oils, and lubricants that would be treated when proper water quality controls are implemented during construction and once the facilities become operational.

This alternative site is not located within the Stoney Creek floodplain or in proximity to the potential wetlands at NSA Bethesda.

Impacts on water resources from the temporary construction material storage would be the same as described for the Medical Facilities Development, except that N-lot would not be used for the entire construction duration.

Biological Resources – Medical Facilities Development

A biological survey was conducted in 2008 at NSA Bethesda to document native and non-native plant species and wildlife species including migratory birds, threatened and endangered species, benthic species, and nuisance wildlife.

Approximately 0.1 acre of currently landscaped area with scattered trees would be converted to impervious surfaces as a result of the construction of Building C. Impacts on vegetation and wildlife would not be significant because the project areas are in the highly developed area of the medical center.

Construction of the underground garage would require the temporary removal of 2.6 acres of the Front Lawn during construction and would result in a temporary impact on wildlife, in particular to the resident Canada geese that use the Front Lawn. Once construction is completed, the area would be reseeded with grass and returned to mowed lawn.

Construction of the above-ground parking garage at the warehouse area alternative site could permanently impact less than 0.05 acre of landscaped vegetation and 0.04 acre of forest.

Construction of the above-ground parking garage at the H-Lot alternative site could permanently impact less than 0.3 acre of landscaped vegetation and 0.05 acre of forest.

Construction of the above-ground parking garage at the Taylor Road Facilities site could permanently impact less than 0.04 acre of landscaped vegetation and 0.01 acre of forest.

Impacts on vegetation and wildlife would not be significant because all three above-ground parking alternatives are in mostly developed areas.

Internal renovations and construction of the temporary medical facilities would not impact vegetation, wildlife, or wildlife habitat (including migratory birds).

Impacts from utilities upgrades such as the replacement of deteriorating condensate return lines would be temporary. The areas that would be disturbed contain minimal vegetation and wildlife species. Once construction activities are completed, the areas impacted would be reseeded with grass and replanted with native vegetation.

Accessibility and appearance improvement projects include additional landscaping to enhance existing landscape on the installation. Tree clearing for the Stoney Creek Trail System project would be limited because the fully accessible trail would follow the existing trail along a portion of the route; therefore, impacts on forest interior dwelling species would be minimal. Portions of the project would be constructed within the 25-foot buffer zone of Stoney Creek. This includes the replacement of one bridge and the construction of an additional bridge over the creek; however, no permanent features of the bridges would be placed within Stoney Creek. Impacts on aquatic and wetland habitats would primarily be temporary, although some permanent impacts could occur in the areas around the foundations of the foot bridges. Species utilizing the aquatic or wetlands habitats would be temporarily displaced, but some less mobile species may be lost, such as invertebrates. Impacts on habitat would be minimized during construction by the use of BMPs. Temporary impacts on existing landscaped vegetation would be expected from the widening/realignment of sidewalks. These areas would be reseeded and re-landscaped after construction is complete.

Renovations for Building 13 would occur to the existing building and would not impact vegetation, wildlife, or wildlife habitat, including migratory birds.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would experience minimal impacts on wildlife because the areas are already disturbed. Nearby wildlife could be disturbed during operation of the storage areas, due to an increase in noise from vehicles and personnel accessing the sites. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity. There would be no impacts on vegetation because these areas are already disturbed.

For all project components, impacts to migratory birds and forest interior dwelling species (FIDS) would be minor. Some migratory species may be temporarily disturbed or permanently displaced during construction, but impacts to the population would not occur. Many neotropical migrants are also FIDS and require relatively large contiguous forest areas (greater than 100 acres) to sustain viable breeding populations. The forested areas at NSA Bethesda are not contiguous and are further fragmented by asphalt paths. In addition, human activity in the wooded areas and in their immediate vicinity might discourage birds in need of interior forest conditions from nesting there.

The Navy contacted USFWS and MDNR on 11 October 2011 to request a list of endangered or threatened species with the potential to occur at NSA Bethesda. USFWS has determined that, except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project areas for the proposed actions. Therefore, the Navy would not be required to consult with

USFWS to satisfy Section 7 of ESA. Should Federal endangered or threatened transients be discovered within the proposed project areas during construction, the Navy would adhere to all requirements under ESA. MDNR has determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites; therefore, the agency does not have specific comments or requirements pertaining to protection measures at this time.

Biological Resources – University Expansion

University Expansion Alternative 1: Under this alternative, up to 4.2 acres of forested area and trails could be affected with 2.8 acres converted to permanent impervious surface. These 4.2 acres of forested area and trails represent approximately 11 percent of the 38 acres of forested lands within the installation. The loss of this area would represent a permanent impact for this forested area. Once construction activities are completed, the impacted areas would be reseeded with grass and replanted with native vegetation.

The loss of forested area would result in direct loss of wildlife through construction activities and loss of habitat. It would cause temporary and permanent alteration of wildlife habitat and direct impacts on wildlife species by disturbance, displacement, and mortality. The more mobile species would be temporarily displaced from the project area to similar habitats nearby during construction; less mobile species (e.g., small mammals, reptiles, amphibians, and bird nests located in the trees to be removed) could be destroyed by construction activities. Due to a low possibility of forest interior dwelling species nesting at NSA Bethesda, because those species require mature forests with a closed canopy that remain fairly undisturbed, it is unlikely that there would be a possibility of loss of those species. Loss of mast-producing forested areas would result in a reduction in food available for species that depend on these resources. Segmenting this larger tract of contiguous forest would result in a reduction of available area for species movement. The resulting developed clearing could increase the diversity of edge habitat by encouraging native shrubs, grasses, and forbs to establish in these areas. Some wildlife use of landscaped vegetation surrounding developments could occur.

Open space scattered throughout the installation maintained as grassy areas has limited value as wildlife habitat due to the lack of vegetative cover. Larger forested parcels on the installation have greater habitat value because they are more likely to sustain a variety of species.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would experience minimal impacts on wildlife, since the areas are already disturbed. Nearby wildlife could be disturbed during operation of the storage areas, due to an increase

in noise from vehicles and personnel accessing the sites. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity. There would be no impacts on vegetation, as these areas are already disturbed.

University Expansion – Alternative 2: Under this Alternative, up to 1.7 acres of maintained lawn and 0.3 acre of wooded buffer between USU and AFRRI could be impacted. The garage and building footprint, at approximately 1.6 acres, would be mostly located on the N-Lot.

Disturbance would be minimal because wildlife species that occur in the area would be limited, and they are adapted to the noise conditions associated with the surrounding land uses.

Impacts from the temporary construction material storage areas would be the same as described for Alternative 1.

The sites for the University Expansion alternatives are included in the determinations from USFWS and MDNR on state or Federal endangered or threatened species.

Air Quality

NSA Bethesda is in an air quality control region that is in moderate nonattainment for 8-hour ozone, maintenance for carbon monoxide (CO), and in nonattainment for particulate matter with diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). It is also in an ozone transport region. Federal actions located in nonattainment and maintenance areas are required to demonstrate compliance with the general conformity guidelines. The Draft EIS has completed a General Conformity Rule applicability analysis for the ozone precursor pollutants nitrogen oxides (NO_x) and volatile organic compounds (VOCs), for $PM_{2.5}$, and the $PM_{2.5}$ precursor pollutant sulfur dioxide (SO_2), and for CO to analyze the impacts on air quality. If annual project emissions are below *de minimis* values, a conformity determination is not required. The *de minimis* values for moderate nonattainment ozone areas in an ozone transport region, areas in nonattainment for $PM_{2.5}$, and CO maintenance areas are 100 tons per year (TPY) for NO_x, $PM_{2.5}$, SO_2, and CO and 50 TPY for VOCs.

Sources of CO, NO_x, VOCs, $PM_{2.5}$, and SO_2 associated with the proposed actions would include emissions from construction equipment, fugitive dust ($PM_{2.5}$), painting of interior building surfaces and parking spaces (VOCs only), new employee commuters, and emissions from stationary units (boilers and generators).

Air Quality - Medical Facilities Development

Construction of the Medical Facilities Development is estimated to begin in 2013 and be completed by 2018. However, a conservative approach was employed in the applicability analysis to ensure that construction scheduling would not result in higher levels of emissions

than predicted. Appendix B of the EIS contains the applicability analysis.

Period 1, beginning during calendar year 2013, includes all appearance and accessibility projects, installation of temporary medical facilities, electrical improvements, and excavation for the Medical Facility parking garage for the underground alternative or demolition of buildings at the site of the above-ground parking alternative (the Taylor Road Facilities site with largest demolition requirement is assumed for the analysis). Although Period 1 is scheduled to occur over approximately 2 years, the analysis conservatively assumes all emissions occur over the same year.

Period 2, beginning during calendar year 2015, includes demolition of buildings on the site of proposed Building C and the construction of Building C, construction of the Medical Facilities parking garage – either underground or above-ground, all Medical Facilities renovation, renovation of Building 13, demolition of 3 existing cooling towers and replacement construction of these plus a new 4th tower, and additional upgrades to utilities (replacement of condensate return lines, repair of damaged water lines, and installation of water tanks for emergency backup). Although Period 2 is scheduled to occur over approximately 3 years, the analysis conservatively assumes all emissions occur over the same year.

Period 3 includes the full operation of all newly constructed buildings and represents the annual emissions from the proposed action.

Medical Facilities Development - Underground Parking

Table ES-1 summarizes the total emissions associated with the construction and operation phases for the Medical Facilities Development with underground parking. Construction-related emissions would be temporary and only occur during the construction period.

Table ES-1: Total Annual Emissions: Medical Facilities Development (underground parking)

Construction and Operations	Total Emissions (Tons per Year)				
	NO_x	VOC	$PM_{2.5}$	SO_2	CO
***de minimis* thresholds**	100	50	100	100	100
Period 1	4.802	0.365	1.890	0.111	1.830
Period 2	18.960	5.217	2.005	0.542	10.426
Period 3 (Full Operation)	4.191	0.923	0.154	0.012	14.930

Medical Facilities Development - Above-ground Parking

Table ES-2 summarizes the total emissions associated with the construction and operation phases for the Medical Facilities

Development with above-ground parking. The air quality impact analysis examines the impacts on air quality from the Medical Facilities Development with the parking structure at the Taylor Road Facilities as the representative above-ground parking garage and it is assumed to be the above-ground parking garage alternative site with the highest anticipated emissions of all the above-ground sites. Therefore, the air quality impacts from the Medical Facilities Development with the other above-ground parking structures would be similar, if not less, than the impacts with this above-ground parking structure.

Table ES-2: Total Annual Emissions: Medical Facilities Development (above-ground parking)

Construction and Operations	Total Emissions (Tons per Year)				
	NO_x	VOC	$PM_{2.5}$	SO_2	CO
***de minimis* thresholds**	100	50	100	100	100
Period 1	0.765	0.073	0.195	0.020	0.399
Period 2	18.960	5.217	2.005	0.542	10.426
Period 3 (Full Operation)	3.676	0.881	0.143	0.011	14.435

As shown in Table ES-1 and ES-2, emissions associated with constructing and operating the Medical Facilities Development and the parking alternatives, when compared to the *de minimis* values for an area that is in moderate nonattainment for ozone, nonattainment for $PM_{2.5}$, and maintenance for CO established in 40 CFR 93.153 (b) fall below the *de minimis* values. Therefore, the Medical Facilities Development would have no significant, adverse impacts on air quality.

Similar to the Medical Facilities Development, construction-related emissions would be temporary and only occur during the construction period. Alternative 2 of the proposed University Expansion is similar to Alternative 1, but alters the placement of Building F and the associated parking garage. Alternative 2 would be located west of the University campus in the developed area between the University and AFRRI. Therefore, there are two alternative options for Period 2, when all University Expansion construction would be expected to occur. Period 3, full operation, would be the same for both alternatives because they would include the same amount of total square footage.

Emissions from greenhouse gases (GHGs) under both above-ground and underground parking garage alternatives were analyzed for operational emissions. The operational differences between all Medical Facilities alternatives is the addition of one generator for the underground parking garage option, which is the alternative with the largest potential for producing GHGs. This alternative would be expected to produce 1,959.60 TPY carbon dioxide equivalent (CO_2e), which is below the recommended threshold of 25,000 tons for a full analysis.

A Record of Non-applicability (RONA) is provided in Appendix B.

Air Quality – University Expansion

Similar to the Medical Facilities Development, construction-related emissions would be temporary and only occur during the construction period. Both alternatives for University Expansion would include the same amount of total square footage but would be sited in different locations on NSA Bethesda. Therefore, there are two alternative options for Period 2, when all University Expansion construction would be expected to occur. Period 3, full operation, would be the same for both alternatives.

Table ES-3 summarizes the total emissions associated with the construction and operation phases for University Expansion Alternatives 1 and 2.

Table ES-3: Total Annual Emissions: University Expansion (Alternatives 1 and 2)

Construction and Operations	Total Emissions (Tons per Year)				
	NO_x	VOC	$PM_{2.5}$	SO_2	CO
***de minimis* thresholds**	100	50	100	100	100
Period 2 (Alternative 1)	7.874	1.094	0.720	0.229	4.221
Period 2 (Alternative 2)	7.804	1.089	0.699	0.227	4.205
Period 3 (Full Operation – both Alts)	0.678	0.066	0.045	0.003	0.521

Therefore, emissions associated with constructing and operating the either of the University Expansion alternatives, when compared to the *de minimis* values for an area that is in moderate nonattainment for ozone, nonattainment for $PM_{2.5}$, and maintenance for CO established in 40 CFR 93.153 (b), fall below the *de minimis* values. Therefore, the University Expansion would have no significant, adverse impacts on air quality.

The University Expansion, under either alternative, would be expected to produce 625.14 TPY CO_2e, which is below the recommended threshold of 25,000 tons for a full analysis.

A RONA is provided in Appendix B.

Air Permit Requirements

Emergency generators for Building C and the parking garage are expected to require a modification to NSA Bethesda's Title V permit, either as permitted sources if they are more than 500 brake horsepower or as registered sources if they are smaller than 500 brake horsepower. Generator specifications are not yet known; however, reasonable size estimates for the generators were made for the air quality analysis.

Noise – Medical Facilities Development

Noise emissions from operation of vehicles can be controlled by restricting the speed at which they move throughout the NSA Bethesda campus. Additional noise reduction measures would further reduce noise at sensitive receptors located along truck routes. Mitigation options for the movement of construction traffic around NSA Bethesda would be similar for all of the above-ground parking facilities.

Noise impacts related to traffic under the Medical Facilities Development occur in areas already experiencing vehicular noise and would not be expected to cause additional impacts. The Medical Facilities Development is anticipated to have minimal impacts on the existing traffic volumes and, therefore, noise impacts from traffic are not anticipated.

For construction noise, potential noise reduction mitigation measures have been identified to control airborne noise impacts for each of the components of the Medical Facilities Development. These measures would be considered and implemented as appropriate.

NSA Bethesda adopted the same noise levels as in Montgomery County Noise Control Ordinance to evaluate the construction noise on sensitive receptors. Per construction noise analysis, noise impacts on receptors off installation are not anticipated.

It is anticipated that construction would occur during daylight hours, with standard hours being from 7:00 AM to 3:00 PM; however, the contractor could request permission to work outside of that timeframe provided the work would occur during daylight hours and comply with the Montgomery County Noise Control Ordinance.

Building C: Construction of Building C includes the demolition of buildings on the site of the proposed facility (Buildings 2, 4, 6, 7 and 8) and the construction of Building C in the approximate footprint of the demolished buildings.

Noise levels adjacent to and outside the southern wall of Building 19 (Outpatient Care Pavilion located approximately 130 feet from the Building C construction area) and the northern walls of Buildings 9 and 9A (Inpatient Addition located approximately 50 feet from the Building C construction area), could experience noise levels in excess of the maximum adopted noise criteria of 85 A-weighted decibels (dBA). However, the walls and windows of these buildings are expected to reduce noise levels within the buildings by approximately 20 dBA so that levels inside the building would be within the adopted thresholds.

Underground Parking: Construction of the underground parking facility would not exceed construction noise levels identified in the Montgomery County Noise Control Ordinance at sensitive receptors. No significant adverse impacts are anticipated.

Warehouse Area Parking: Construction of the parking facility at the warehouse area site would not exceed construction noise levels identified in the Montgomery County Noise Control Ordinance at sensitive receptors. No significant adverse impacts are anticipated.

H-Lot Parking: Construction of the parking facility at the H-Lot would exceed the construction noise level standards at the outside western wall of the Navy Lodge. Almost 10 dBA of reduction would need to be achieved to meet these standards.

However, the walls and windows of these buildings are expected to reduce noise levels within the buildings by approximately 20 dBA, so that levels inside the building would be within the adopted thresholds.

Taylor Road Facilities: Construction of the parking facility at the Taylor Road site would not exceed construction noise levels identified in the Montgomery County Noise Control Ordinance at sensitive receptors. No significant adverse impacts are anticipated.

Internal Renovations: Internal renovations would occur inside existing buildings and would not use heavy construction equipment. Power for hand tools would be supplied from existing electrical systems within the buildings and would not require generators. Temporary and intermittent noise from vehicles delivering construction materials and pickup trucks transporting workers are not expected to create significant noise impacts.

Temporary Medical Facilities: Construction of the temporary medical facilities would involve the installation of modular, prefabricated structures placed on the existing G-Lot parking areas. Utility connections would involve underground electric and communications lines and connections to water and sanitary sewer lines. Construction of the temporary medical facilities is not expected to exceed construction noise levels identified in the Montgomery County Noise Control Ordinance at sensitive receptors off-campus (Stone Ridge School) or on-campus facilities. No significant adverse noise impacts due to construction of the facility at this site are anticipated.

Utility Upgrades: Provided that construction activity in the vicinity of AFRRI occurs between the hours of 7:00 AM and 5:00 PM on weekdays, construction of the new cooling towers is not expected to generate construction noise above that permitted by the Montgomery County Noise Control Ordinance. Construction occurring on weekends or after 5:00 PM on weekdays would require some combination of mitigation measures to reduce noise levels. It is anticipated that construction would occur during daylight hours but the contractor could request to work outside of those hours, in compliance with the Montgomery County Noise Control Ordinance.

Upgrades to utility infrastructure throughout NSA Bethesda would also involve new trenching in some areas or exposing utility transmission

lines in existing trenches in other areas. No impacts due to construction noise are anticipated at receptors located off the installation. In areas where jackhammers or other loud equipment are used adjacent to sensitive on-campus receptors (e.g., inpatient or outpatient facilities), it may be necessary to build a temporary noise wall between the construction site and the receptor, or otherwise attenuate excessive noise levels. No significant adverse noise impacts due to utility infrastructure upgrades are anticipated.

Accessibility and Appearance Improvements: Construction of the proposed accessibility and appearance improvements would involve delivery of construction and landscaping materials and the use of light-duty construction equipment such as forklifts, backhoes, and small hydro-static front end loaders. This work would occur throughout the campus. Sensitive receptors that may be affected include populations located in the northern extent of Building 19 and Building 63, portions of the northern extent of Building 9, the southern extent of Building 61 and the western extent of Building 17. If construction work occurs less than 50 feet from these building locations and noise levels exceed adopted levels, noise mitigation measures, such as the installation of portable noise barriers or noise tents, would be implemented. Noise generated by the construction activities would be short-term and temporary. Due to the limited duration of construction activity in any one area for these projects and because heavy-duty equipment would not be required, no significant adverse impacts on sensitive receptors are anticipated.

Building 13 Renovations: Sensitive receptors are not located within the area affected by construction noise from the renovation of Building 13. Temporary and intermittent noise from vehicles delivering construction materials, pickup trucks transporting workers, and exterior and interior renovation work are not expected to create significant noise impacts.

Construction Material Storage: Typical noise-generating activity occurring at these areas would include delivery truck noise (delivery of construction materials by flatbed trucks or larger tractor-trailer trucks), loading or unloading construction materials (using a forklift or similar), vehicle noise generated by construction worker vehicles, and the movement of mobile construction equipment into and out of the area. Construction or fabrication is not anticipated at temporary storage areas. Temporary and intermittent noise from vehicles delivering and picking up construction materials are not expected to create significant noise impacts.

Noise – University Expansion

Noise impacts related to traffic under either alternative would occur in areas already experiencing vehicular noise and would not be expected to cause additional impacts. The University Expansion would have minimal impacts on the existing traffic volumes; therefore, no impacts from traffic noise are anticipated.

Per construction noise analysis, noise impacts on receptors off installation are not anticipated.

University Expansion – Alternative 1: Construction of Alternative 1 is not expected to exceed the adopted construction noise levels.

University Expansion – Alternative 2: Some combination of attenuating measures could be required during periods when construction is occurring adjacent to the University and AFRRI to allow activities to occur without disruption due to noise.

Utilities/Infrastructure – Medical Facilities Development

Construction, demolition, and operation of any of the components of the Medical Facilities Development would generate solid waste, including hazardous waste such as asbestos containing materials, lead-based paint (LBP) debris, and laboratory waste, requiring collection and disposal by private haulers according to applicable Federal and state regulations.

Building C: Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C are expected to result in a net increase in load of approximately 4.6 MW. Electric lines that run through the crawl space of Buildings 2, 7, and 8 would have to be relocated prior to demolition.

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C are not expected to result in a significant net change in potable water or sewer demand. Both of these services are provided to the installation by Washington Suburban Sanitary Commission (WSSC). The functions that utilize natural gas at this facility are not expanding. The additional gas demands to heat or cool Building C are due to an increase in overall building size compared to the buildings being demolished and would be offset by the increased energy efficiency of the new Building C. Natural gas services is provided to the installation by Washington Gas. Sewer, steam, condensate return, and chilled water lines run through the crawl space of Buildings 2, 7, and 8 and would have to be relocated prior to the demolition of these buildings. The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers and would ensure no impact on regional service provision. Building C would require a net increase of 10,803 pounds per hour of steam, 1,445 gpm of chilled water, and 1,095 tons of cooling capacity over the existing buildings that would be demolished. The planned utility upgrades would allow the installation’s existing Central Utility Plant (CUP) to meet the increased heating and cooling requirements.

Power demands for the parking garage alternative (underground garage or any of the above-ground garage) would be relatively minor and accommodated within the proposed electrical upgrade. There would be no

sewer or natural gas service to the parking garage. Water line would be needed for fire suppression system and stormwater management systems would be required.

The following relocations could be required for the parking garage alternatives. The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers.

- Warehouse Area Parking: The relocation of a water line may be required as a result of the construction of this parking facility.
- H-Lot Parking: The relocation of a natural gas and water line may be required as a result of the construction of this parking facility.

Temporary Medical Facilities: The temporary medical facilities are a replacement of the existing functions within the buildings (2, 4, 6, 7, and 8) to be demolished. As the temporary medical facilities would not house additional functions beyond what was displaced from these locations, there would be no net change to the utilities associated with the operation of this project.

Internal Renovations: Little or no impacts on the installation-wide data and telecommunication networks would occur as a result of these internal renovations. All other impacts on utility services and infrastructure would be insignificant.

Utilities Upgrades: An increase in power capacity is planned that would support all currently planned projects and leave excess capacity available for future growth. Demolition of three cooling towers and construction of four cooling towers at Building 16, replacement of damaged water distribution lines, and provision of backup water supply storage would occur as a result of this component of the proposed action. Construction of cooling tower upgrades, and replacement of condensate return lines would all have a positive impact on the steam and chilled water system on NSA Bethesda by increasing the capacity of these systems. The existing failing condensate lines would be replaced with insulated steel piping, and substantial leaks would be eliminated. This would increase the efficiency of the central steam heating system.

Building 13 Renovations: Minor increases in usage for utilities including water, sewer, heating/cooling, telecommunications, and electricity would be expected due to the increased occupancy that would result from the renovations. Specific load requirements are not known as design has not progressed; however, it would be accommodated within the upgrades occurring under the proposed actions.

Construction Material Storage: No impacts on utilities would be anticipated.

The Navy is coordinating with the utilities service providers (water/sewer provider: WSSC; natural gas provider: Washington Gas; electric provider: Potomac Electric Power Company) to ensure that these proposed changes do not affect service delivery to the larger community by verifying that systems can accommodate the additional load.

Utilities/Infrastructure – University Expansion

Either alternative for the University Expansion would increase the University's demand for data, alarm, and voice communication services. There is sufficient available capacity on the data and telecommunications systems to support expansion of the University without adverse impacts on existing users.

There is ample available capacity to support power demands of the University Expansion alternatives via an independent feeder that supplies electricity to the USU and AFRRI complexes. However, the Navy will coordinate with PEPCO to confirm the capacity once the design work is completed and the exact utility requirements are known.

The increase in demand for natural gas to heat steam for the University Expansion would be minor compared to the overall gas demand on the installation. The Navy is coordinating with Washington Gas on the capacity and because design work in not yet complete, the initial coordination is based on the square feet estimates for Building F and the parking garage. The Navy will confirm the capacity once the design work is completed and the exact requirements are known.

Based on the building sizes for Building F and the parking garage, the University Expansion is expected to increase the demand for potable water by approximately 20,460 gallons per day (gpd). A WSSC sanitary sewer line currently exists adjacent to each of the alternative University Expansion sites. The expansion is expected to increase the demand for sewer service by approximately 20,460 gpd. The Navy is coordinating with WSSC on the capacity. The Navy will confirm the capacity once the design work is completed and the exact requirements are known.

Either location for the University Expansion would require stormwater management systems and mitigation measures to comply with Maryland Stormwater Management Guidelines for State and Federal Projects.

University Expansion - Alternative 1: All impacts discussed above would occur under this alternative. The steam/chilled water utilities that would be attached to the University Expansion would have to travel a longer distance to reach Alternative 1 compared to Alternative 2.

University Expansion - Alternative 2: All impacts discussed above would occur under this alternative. Depending on the final configuration of the expansion, an existing WSSC sanitary sewer line may have to be relocated.

The Navy is also coordinating with the utilities service providers to ensure that these proposed changes do not affect service delivery to the larger community by verifying that systems can accommodate the additional load.

Transportation

A Traffic Study was conducted as part of the EIS to evaluate the impacts on traffic and transportation from the Medical Facilities Development and University Expansion; the complete Traffic Study is included in Appendix D. The Traffic Study focused on the external intersections and arterials, internal intersections and gate counts, internal parking, and bicycle/pedestrian impacts. These systems together provide an overall evaluation of the potential impacts of the proposed actions on NSA Bethesda and nearby roadways and intersections.

To ensure the analysis complies with all state and county requirements, agreement was sought from M-NCPPC, MSHA, and MCDOT on the study area, analysis methods, and future external roadway distribution of new NSA Bethesda trips. The analysis methods agreed upon for the external roadway intersections followed the Montgomery County and MSHA requirements. A separate more commonly accepted traffic analysis method was used for the internal roadway network because these roadways are not under county or state jurisdiction, but will be reviewed by NCPC. To provide additional traffic operation measurements beyond MSHA and Montgomery County requirements, this same commonly accepted traffic analysis method was also used to evaluate the external roadways.

The intersections external to NSA Bethesda that were included in the traffic study were identified based on a preliminary site trip assignment through 17 intersections adjacent to the installation, in accordance with the M-NCPPC's Local Area Transportation Review (LATR) methodology. Expansion of this list to include additional intersections identified by the public during the scoping period was considered. Based on the site trip assignment and coordination with M-NCPPC, the original 17 intersections were determined to capture the majority of the traffic that would be generated by proposed actions; therefore, the additional intersections were not included.

Existing condition data and analysis of existing roadways provided the baseline for evaluation of the external and internal roadways serving NSA Bethesda. The Traffic Study presents a 2018 No Action (No Build) Alternative, which provides a future roadway operation base to compare the future 2018 Build Alternatives (the proposed actions). The 2018 No Build Alternative presents post-BRAC conditions as the baseline and

includes assumptions that will directly affect the amount of traffic assigned to the external and internal roadway network. The general categories of the 2018 No Build assumptions that provided the Traffic Study framework are:

- External Roadway Improvements: Roadway improvements along the key roadways serving NSA Bethesda listed in the BRAC Mobility Projects Matrix by the BRAC Implementation Committee.

- External Transit Improvements: Transit improvements that serve NSA Bethesda, helping to reduce the need to drive and park at the installation.

- Background Developments: Significant developments proposed in the vicinity of NSA Bethesda provided by the M-NCPPC.

- Gate Improvements: Intersection improvements separated from the external roadway improvement list serving the NSA Bethesda Gates #3 and #4 entrances. These improvements are funded and expected to be completed by 2012. Improvements to Gates #1, #2, and #5 have been previously completed and are part of the baseline assessment.

- Internal Roadway Improvements: Roadway improvements along internal installation roadways expected to be completed by 2018.

- Planned Projects: Planned projects at NSA Bethesda expected to be completed by 2018.

- Internal Installation Parking: Parking facilities expected to be operational in 2018.

The 2018 proposed actions (Build Alternatives) were developed based on new parking facilities to serve the Medical Facilities Development (Building C) and the University Expansion (Building F).

The Build Alternatives studied in the Traffic Study were a combination of one medical facility parking option and one USU facility parking option. Since there are five medical facility proposed parking options (two ingress/egress options for the underground garage and three above-ground garage alternative locations) and two USU parking alternatives, a total of ten alternatives were evaluated. The following alternatives were evaluated for traffic.

- No Build: Use of parking facilities expected to be in place based upon the addition of eight internal installation facilities (not including Buildings C or F).

- Build Alternatives 1, 2, 3, 4,and 5 include the USU Alternative 2 parking garage accessed from Stone Lake Road paired with: 1) new underground parking garage - with its entrance located at the

North Palmer Road intersection with North Wood Road North and exit located at the South Palmer Road intersection with South Wood Road , 2) new underground parking garage with its entrance and exit located along North Palmer Road (G-Lot), 3) new parking garage in the industrial/ warehouse area accessed from Grounds Road, 4) new parking garage accessed from Stokes Road (H-Lot), 5) new parking garage accessed from Taylor Road adjacent to the proposed Wounded Warrior Transition Lodge (WWTL).

- Build Alternatives 6, 7, 8, 9, and 10 are the same as Alternatives 1, 2, 3, 4, and 5 except they are paired with USU Alternative 1 new parking facility along South Palmer Road between Gates #4 and #5.

External Intersection Analysis

For each build alternative, 16 external signalized intersections, plus one unsignalized intersection were analyzed. The 17 intersections covered three arterials, Rockville Pike, Jones Bridge Road, and West Cedar Lane. Since MSHA and M-NCPPC both require intersections to be evaluated using the critical lane volume (CLV), the Traffic Study used that method and the Highway Capacity Manual (HCM) as a secondary evaluation method to examine delay and density. As the HCM method provides a more accurate measure for unsignalized intersection analysis, the HCM was used for the one unsignalized intersection. The external roadway study intersections are:

1. Rockville Pike & Grosvenor Lane
2. Rockville Pike & Pooks Hill Road
3. Old Georgetown Road & Oakmont Avenue/Cedar Lane
4. Locust Ave/West Drive & Cedar Lane
5. Rockville Pike & Cedar Lane
6. Rockville Pike & North Drive/School Driveway
7. Rockville Pike & NIH Delivery Entrance/North Wood Road (Gate #1)
8. Rockville Pike & Wilson Drive
9. Rockville Pike & South Drive/South Wood Road (Gate #2)
10. Rockville Pike & Center Drive/Jones Bridge Road
11. Gunnell Road (Gate #3)/Glenbrook Parkway & Jones Bridge Road
12. Grier Road (Gate #4) & Jones Bridge Road
13. University Road (Gate #5) & Jones Bridge Road

14. Connecticut Avenue & Jones Bridge Road & Kensington Parkway

15. Manor Road & Jones Bridge Road

16. Jones Bridge Road & Jones Mill Road

17. Rockville Pike/Wisconsin Avenue & Woodmont Avenue/Glenbrook Parkway

Within the study area, intersections 7, 9, 11, 12, and 13 were the locations of security gates for NSA Bethesda.

External Intersection Analysis Results Summary

For the external roadways, there were no significant impacts on any of the intersections or arterials when comparing the 2018 No Build condition to the 2018 Build Alternatives. The intersection capacity results are expressed in terms of the level of service (LOS), which is indicated by a letter grade of A through F. Although some intersections would experience a slight decline in LOS, no intersections would shift to a failing LOS.

Based upon the AM peak hour CLV analysis, the following impacts would occur (Refer to Table 4-24 in Section 4.7). Build Alternative 9 would change from a LOS of A to B at the #8 Rockville Pike at Wilson Drive intersection. This would reflect the combination of new staff trips originating from the north and entering the installation at Gate #2 destined for the new USU Alternative 1 parking structure, and shifted staff trips originating from the north entering the installation at Gate #3 destined for the new parking structure in H-Lot. The #9 Rockville Pike at South Wood Road (Gate #2) intersection would change from a LOS B to C for Build Alternatives 1, 4 and 6 through 10. Build Alternative 1 would include a shift in exiting patient trips from Gate #1 to Gate #2 using the new underground parking structure, thus an increase of traffic at intersection #9. Build Alternatives 4 and 9 would include new staff trips originating from the north entering Gate #3, destined for the new parking structure in H-Lot. Build Alternatives 6 through 10 would include new staff trips originating from the north entering Gate #2, destined for the new USU Alternative 1 parking structure. The LOS for all other external intersections would not change as a result of the proposed actions. Note that Intersections #5 and #14, achieving LOS E under the No Build condition, continue to achieve LOS E under all of the Build Alternatives.

Based upon the PM peak hour CLV analysis, the following impacts would occur (Refer to Table 4-25 in Section 4.7). The #8 Rockville Pike at Wilson Drive intersection would change from a LOS A to B for Build Alternatives 4 and 9, due to the increase in traffic passing through this intersection from both Gate #3, originating from the new H-Lot parking structure and from Gate #2, originating from the new USU alternative parking structures. The #12 Jones Bridge Road at Grier

Road (Gate #4) intersection would change from a LOS of B to C for Build Alternatives 1, 2, 4, 6, 7, and 9, reflecting the new staff trips exiting through Gate #4, originating at the new USU parking structures. The LOS for all other external intersections would not change as a result of the proposed actions. Note that Intersections #3 and #14, which achieve LOS E and LOS F respectively under the No Build condition, continue to achieve LOS E and LOS F respectively under all of the Build Alternatives.

The #6 Rockville Pike at North Drive intersection is unsignalized; therefore, the CLV analysis was not used to determine the operation. In this case, the HCM analysis was used as a primary analysis method for the intersection. Based upon the HCM analysis, this intersection would operate with the same LOS between the No Build condition and Build Alternatives (LOS of B) during both peak periods (Refer to Tables 4-24 and 4-25 in Section 4.7). The HCM, used as a secondary evaluation method for the external signalized intersections, indicates that for all Build Alternatives, all intersections would have a small change in the vehicle delay and density; however, the change was not significant enough to cause the HCM-calculated LOS to change to a failing condition. While the LOS at one external intersection during the AM peak hour and three external intersections during the PM peak hour changed to a lower LOS, the worst change calculated would be a LOS of C, which represents a stable condition according to the HCM.

The arterial analysis was performed as a requirement for M-NCPPC's Policy Area Mobility Review for Rockville Pike, Jones Bridge Road, and West Cedar Lane. The analysis consisted of calculating the travel speed and travel time from one end of the corridor to the other along the three corridors and comparing the travel speed between the No Build condition and Build Alternatives. Based upon the AM peak hour arterial analysis, the greatest difference in travel speeds between the No Build condition and Build Alternatives would be 4 percent for Alternatives 4 and 9 along Jones Bridge Road westbound. Based upon the PM peak hour arterial analysis, the greatest difference in travel speeds between the No Build condition and Build Alternatives would be 3 percent for all Build Alternatives along Rockville Pike northbound (Refer to Tables 4-26 and 4-27 in Section 4.7).

Internal Intersection Analysis

The HCM method was used to calculate the LOS for thirteen internal intersections, which include a proposed intersection at South Palmer Road and South Wood Road serving the exit ramp from the underground parking garage. Each alternative shifted travel patterns around NSA Bethesda, lowering the LOS for some intersections, while raising the LOS for others. For each intersection, the difference between the projected 2018 No Build condition and given Build Alternative was measured. For the internal roadway network, there were no significant impacts on any of the intersections when comparing the 2018 No Build condition to the 2018 Build Alternatives. The lowest LOS at any of internal intersections was LOS D, which occurred at the R.B. Brown

Drive & America Garage/Garage 54 Exit during the AM peak hour under Build Alternatives 3, 5, 8, and 10 (a change from LOS C under No Build), and at the intersection of East Palmer Road/Gunnell Road and Stokes Road under Build Alternatives 4 and 9 during the PM peak hour (changing from LOS B). All other intersections achieved a LOS C or better under the Build alternatives. (Refer to Tables 4-28 and 4-29 in Section 4.7).

Internal Parking Analysis

The 2018 No Build condition parking facility inventory provided a base for determining how much parking would potentially be available for the 270 new employees anticipated to be added to the installation as part of the ten Build Alternatives. The total NSA Bethesda available parking is bound by the NCPC staff parking ratio of one space for every three employees. Under all Build Alternatives, the staff parking ratio would meet the NCPC ratio. For Build Alternatives where existing parking lots would be replaced by a new parking facility, those lost spaces were assumed to be provided for within the new 400-space parking structure. This reduced the number of available new spaces to less than 270 in two of the ten Build Alternatives, and assumed new commuter trips in those alternatives were lowered accordingly.

Bicycle and Pedestrian Analysis

For the bicycle and pedestrian network, there are ample sidewalks, bike racks, and ADA compliant curbing at intersections where new pedestrian trips would occur. Therefore, no mitigation measures are recommended for the bicycle or pedestrian network. However, it is recommended that if one of the 2018 Build Alternatives 6 through 10 be implemented, signing and pedestrian markings clearly identify an appropriate crossing location between the new parking structure serving Building F and the USU. This recommendation is to accommodate the new pedestrian trips created by the 220 USU employees being consolidated to NSA Bethesda.

Cultural Resources – Medical Facilities Development

The Navy initiated early and frequent coordination with the MHT and the NCPC and is pursuing formal Section 106 consultation with MHT. The consultation initiation letters are included in Appendix A.

Building C: Demolition alone of Buildings 2, 4, 6, 7, and 8 would not have direct impacts on cultural resources since these buildings have all been determined to be ineligible for the National Register of Historic Places (NRHP). However, the replacement Building C would be attached to the rear or east of the Central Tower Block (Building 1) and be engaged with Buildings 3 and 5. A design parameter has been set that the height of Building C would be generally consistent with the height of the tallest building to be demolished. Future design reviews by MHT and NCPC under their respective legal authorities would be intended to result in the avoidance and/or minimization of any

potential adverse effects on the Central Tower Block or Buildings 3 and 5 as historic properties.

Underground Parking: No adverse effect is anticipated if ingress/egress on Wood Road at the Building 1 Entrance is sensitively designed in accordance with the Secretary of Interior standards.

Warehouse Area Parking: The Navy is currently preparing Determination of Eligibility (DOE[s]) for Buildings 149 and 152 at NSA Bethesda for which NRHP eligibility has not yet been formally determined. Preliminary indications are that the two buildings are ineligible; however, the determination process will require concurrence by MHT before being considered final.

H-Lot: There would be no adverse impact on historic properties from placing a parking structure at this site.

Taylor Road Facilities Parking Garage: DOEs would be required for Buildings 59, 69, and 79 prior to their demolition, and Section 106 consultation with MHT if determined NRHP eligible; no adverse impacts on adjacent historic properties (Flag Quarters and Building 17) are expected because of the limited scale and distance.

Accessibility and Appearance Improvements: North Palmer Road – Review of the detailed design drawings by MHT and NCPC would be required to ensure avoidance of adverse effects on Building 1, the Front Lawn, and Building 11.

Building 17 Connector: Review design drawings by MHT and NCPC would be required to ensure avoidance of adverse effects on Building 17 and the Flag Quarters.

Stoney Creek Trail System: Further archaeological investigations may be required once the bridge footprints and ground disturbance potential of the project has been identified. The appropriate course of action to achieve compliance with the NHPA and other relevant cultural resource laws would be determined and implemented by the Navy, following consultation with the MHT.

Utilities Upgrades: There would be no impacts on cultural resources from the proposed utilities upgrades.

Internal Renovations: Section 106 would be required only if there are changes to the grand multi-level Art Deco entrance hall of the Central Tower Block; otherwise, the interior renovations would have no adverse effect upon historic properties.

Building 13 Renovations: There would be no adverse effect on historic properties. The Navy would consult with MHT on the development of a design that would not negatively impact the remaining character-defining features such as the fenestration, materials, rhythm of openings, and period details such as the entrance canopy.

Construction Material Storage: The areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are previously disturbed, generally flat areas. Some physical impacts on the ground surface would occur as a result of construction staging on the sites, but impacts would be temporary and the areas would be restored to existing conditions once construction is complete. None of the areas fall within any known zone of archaeological sensitivity. The proposed laydown area between the helipad and Navy Exchange is located within a NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.

Cultural Resources – University Expansion

University Expansion – Alternative 1: No impacts are anticipated. A 2007 Phase I archaeological investigation deemed that the site required no further study and was not eligible for the NRHP. Impacts from the temporary construction material storage areas would be the same as those described for the Medical Facilities Development.

University Expansion – Alternative 2: The AFRRI complex has been recently determined eligible for the NRHP. However, it does not share the Art Deco style or the period of significance of the Historic District and lacks exterior architectural importance. Therefore, the construction of the University Expansion in this location would have no adverse impact on the integrity of AFRRI as a historic property or on any other cultural resource. Impacts from the temporary construction material storage areas would be the same as those described for the Medical Facilities Development.

Land Use and Aesthetics – Medical Facilities Development

All direct effects on land use are within NSA Bethesda. Land use is consistent with plans and precedence; proposed facilities within NSA Bethesda are compatible with adjacent facilities. No direct effects outside the NSA Bethesda boundaries on land use are expected. Additionally, the proposed actions are consistent with the 2012 NSA Bethesda Master Plan.

Building C Construction, utilities upgrades, renovation of Buildings 1, 3, 5, 9, and 10, and demolition of Buildings 2, 4, 6, 7, and 8: No impacts on land use would occur because the proposed actions would occur entirely within the medical functional zone of NSA Bethesda. Additionally, there would be no significant impact on aesthetics/visual resources.

Underground Parking Garage: Construction of the underground parking garage would have short-term visual impacts. This alternative is consistent with the 2012 NSA Bethesda Master Plan.

Above-ground Parking Garage: All above-ground parking alternative sites would be compatible with the functional land use zones in which

they would be constructed. Additionally, these garages would be visually compatible with surrounding buildings. Viewers of the warehouse and H-Lot parking garages would be more sensitive to their construction than to the underground or Taylor Road Facilities parking garage. All above-ground parking alternatives are consistent with the 2012 NSA Bethesda Master Plan.

Medical Facilities Internal Renovations: The proposed renovations in Buildings 1, 3, 5, 9, and 10 would be in areas internal to the buildings; therefore, there would be no impacts on land use or aesthetics.

Temporary Medical Facilities: Temporary alteration of the visual character would occur; however, following construction the site would revert back to a surface parking lot and there would be no long-term, permanent impacts on the visual character of G-Lot.

Utilities Upgrades: Because the replacement of condensate lines, electrical capacity upgrades, and the supply water tanks would be underground and their construction period would occur only temporarily, impacts on land use are not anticipated from those utilities upgrades. The replacement and construction of the cooling towers would occur in an area with facilities of similar functions and therefore, impacts on land use are not anticipated. This action is consistent with the 2012 NSA Bethesda Master Plan.

Accessibility and Appearance Improvements: Beneficial impacts on land use are anticipated because improvements to existing pathways and infrastructure would make these improved pathways and infrastructure more similar to other landscaping and pathways on the installation and would enhance the accessibility around NSA Bethesda. This action is consistent with the 2012 NSA Bethesda Master Plan.

Building 13 Renovations: Renovations to this building would occur in an already existing building and the renovations would not cause the use of the building to conflict with the functional zone of the area; therefore, impacts on land use are not anticipated.

Construction Material Storage: The areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would result in temporary impacts on the visual character. However, these impacts would cease upon completion of construction and there would be no long-term, permanent impacts on to the visual changer of these areas.

Land Use and Aesthetics – University Expansion

University Expansion - Alternative 1: Under this alternative, forested areas and recreational trails in the area of the construction site would be impacted. However, NSA Bethesda would ensure that the removal of the forested area would be minimized to the extent possible during

the design of this alternative. Additionally, the proposed action is consistent with the 2012 NSA Bethesda Master Plan.

The visual character of the area would be altered, and the proposed new structures would have long-term impacts on the existing visual character of the area. The areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would result in temporary impacts on the visual character. However, these impacts would cease upon completion of construction and there would be no long-term, permanent impacts on to the visual changer of these areas.

University Expansion - Alternative 2: This alternative would comply with several objectives of the 2012 NSA Bethesda Master Plan. This alternative is located in the N-Lot parking lot between the USU campus and AFRRI; therefore, it would offer the potential for fostering a continuous campus feel between the two tenants and a direct connection to the AFRRI buildings, where shared laboratories are located. This alternative would be located in an area with mostly already disturbed land. In addition, construction of the University Expansion on this site would meet NCPC's goal of using previously developed sites for new construction.

The proposed construction of the University Expansion would not be anticipated to notably change the visual character of the area. Impacts from temporary construction material storage would be the same as those for Alternative 1.

Socioeconomics

Major beneficial economic effects on the surrounding economy would be expected under each proposed action to come from the large investment in construction and renovation of facilities.

Socioeconomics – Medical Facilities Development

All cost and outputs below are dependent on the selection of the underground garage and the three above-ground alternative sites; the highest costs and outputs are for the underground parking:

- Underground Garage - $629,462,000
- Warehouse Area Parking Garage - $617,648,337
- H-Lot Parking Garage - $617,609,000
- Taylor Road Facilities Parking Garage - $618,484,650

The estimated sales volume generated by these alternatives would be between $1,000,527,000 and $1,019,728,000. The total income supported would be between $217,717,700 and $221,896,100. Total jobs supported by these alternatives would be between 4,432 and 4,517 jobs. The 50-person increase in support staff would support $6,185,046 in sales; $3,768,389 in total income; and 77 jobs.

The Medical Facilities Development would not result in any disproportionally high or adverse impacts on low-income and minority groups or children.

Socioeconomics – University Expansion

While it is expected that University Expansion Alternative 1 would have slightly higher construction costs than University Expansion Alternative 2 due to the increased costs associated with stormwater mitigation, a loading dock, and site excavation, the exact differences in cost are not yet available between the two site alternatives because the project is still in initial planning stages. Therefore, local employment, income and sales forecasts, and modeling data are the same for both sites.

Beneficial economic effects on the local economy would be expected. The construction spending for either of the University Expansion alternatives is estimated to be $252,800,000. This would support: $409,536,000 in sales; $89,116,310 in total income; and 1,814 jobs. Approximately 346 construction related-jobs would be supported on an annual basis during the construction period.

The Medical Facilities Development would not result in any disproportionally high or adverse impacts on low-income and minority groups or children.

Human Health and Safety – Medical Facilities Development

Demolition of Building 7 would require the permanent removal of one UST and one daytank, both containing diesel. Backup generators at Building C would be installed. Demolition of Building 99 to construct the warehouse area parking garage would require the removal of two USTs, one above-ground storage tank (AST) and one oil/water separator. Demolition of Building 53, to construct the Taylor Road Facilities parking garage, would require the removal of one UST and one AST; if any contaminated soils are discovered during the removal process, they would be remediated in accordance with Federal and state regulations. The University Entry, part of the accessibility and appearance improvements, has a UST (277a) in the vicinity of the project area.

Because of the age of the buildings, demolition of Buildings 2 (built in 1941), 4 (1941), 6 (1942), 7 (1963), and 8 (1963) could encounter LBP and/or asbestos-containing material (ACM). Internal renovations activities in Buildings 1 (built in 1941), 3 (1943), 5 (1943), 9 (1980), and 10 (1980) could encounter LBP and/or ACM.

Building 149 (built in 1951) and Building 152 (1951), which would be demolished to construct the warehouse area parking garage, could contain LBP and/or ACM.

Based on building age, Buildings 28 (built in 1952) and Building 53 (1976), which would be required to build the Taylor Road Facilities parking garage, could contain LBP and/or ACM.

The deteriorating condensate return lines to be replaced as part of the utility upgrades, if insulated, could contain ACM.

Per standard practice, any buildings thought to contain LBP or ACM would be checked prior to demolition or renovation in any building, and NSA Bethesda has procedures in place to manage the substances to identify problem areas, protect and inform affected persons, remediate as necessary, and comply with applicable Federal and state regulations. Therefore, impacts resulting from buildings that contain these materials are not anticipated.

Demolition of Buildings 2 and 8 would occur in the area of Solid Waste Management Unit (SWMU) 13 (Dental Laboratory Temporary Storage Area) and SWMU 14 (National Cancer Institute Temporary Storage Area), respectively; NSA Bethesda received No Further Action determinations for both SWMUs 13 and 14 from USEPA. Therefore, no impacts are anticipated.

Warehouse Area Parking: Demolition of Building 149 would occur in the area of SWMUs 4 (Pesticide Shop Former Temporary Storage Area) and 34 (Pesticide Handling and Mixing Building); NSA Bethesda received No Further Action determinations for SWMUs 4 and 34 from USEPA.

Demolition and construction activities would also occur in the vicinity of SWMU 32 (Metal Storage Yard) and SWMU 33 (Million Dollar Hill); these two sites are part of the Installation Restoration Program and have an approved preliminary work plan for remediation. Remediation, as needed, would commence upon final approval of the work plans. Development in or around SWMUs or Areas of Concern (AOCs) under the Resource Conservation and Recovery Act (RCRA) Corrective Action Permit (CAP) would occur only with concurrence from USEPA.

Taylor Road Facilities: Demolition of Building 53 and AOC 2 now includes the Building 53 UST (formerly SWMU 31) and it would also occur in the vicinity of SWMU 5 (Roadside Laboratory Waste Disposal). AOC 2 covers multiple sites, including the area near Taylor Road, and overall clean-up actions are ongoing. The Taylor Road area is completed and full close-out of AOC 2 is anticipated prior to ROD signature.

Utilities Upgrades: Replacement of condensate lines would likely require construction activities in the vicinity of SWMU 5, SWMU 32, and SWMU 33. NSA Bethesda received a No Further Action determination for SWMU 5 from USEPA, and as discussed above, work plans have been developed for SWMUs 32 and 33.

Accessibility and Appearance Improvement Projects: Portions of both the Building 17 Connector and the Stoney Creek Trail System improvements would occur in the area of SWMU 5.

Building 13 Renovations: Building 13 contains LBP and/or ACM. NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations; therefore, impacts are not anticipated.

The Navy received No Further Action determinations for SWMUs 4, 5, and 35. Work plans for remediation have been developed for SWMUs 32 and 33. Development in or around SWMUs or AOCs under the RCRA CAP would occur only with concurrence from USEPA.

Construction of Building C would not increase the mission or function of the facilities. Therefore, it is assumed that there would be no increase in the regulated medical waste (RMW), and it would continue to be handled in accordance with all applicable Federal and state regulations and NSA Bethesda guidance.

AT/FP considerations would be evaluated in the design of the new Building C, and appropriate setback requirements would be implemented in compliance with UFC antiterrorism standards of February 2012, which would be met to the extent practicable. If existing constraints (density of buildings etc.) do not allow the standoff distances to be met, then additional blast protection measures, such as building hardening measures, would be incorporated into the building design to meet the minimum standoff distances. As a result, there would be no impacts on human health and safety.

Because the temporary medical facilities would be occupied for longer than one year, AT/FP standoff distances would be applicable. Impacts would be similar to those for Building C.

Human Health and Safety - University Expansion

University Expansion – UST/ASTs and SWMUs

University Expansion – Alternatives 1 and 2*:* There are no existing UST/ASTs or SWMUs in the proposed location; therefore, no impacts are anticipated.

University Expansion – Hazardous Materials

University Expansion – Alternatives 1 and 2: While the new facilities to be constructed under this alternative would not increase the mission or function of the USU, it would consolidate into one building dispersed departments, centers, and activities, some of which currently reside off campus. By moving facilities that currently reside off campus to facilities on campus it is anticipated that the authorized user list of the hazardous materials would grow slightly. However, the increase would be managed in compliance with all

applicable Federal and state regulations and in adherence to the NSA Bethesda Hazmat Program, which includes SOPs required for proper hazardous materials control and management. Therefore, significant impacts from the increase of hazardous materials used on NSA Bethesda are not anticipated.

University Expansion – Hazardous Waste

University Expansion – Alternatives 1 and 2: USU campus facilities currently produce approximately 1,200 pounds of hazardous waste per month. The approximate amount of regulated waste (both hazardous and medical combined) produced at the off-site locations is 500 pounds per month. Therefore, it is anticipated that the total amount of hazardous waste (not including medical waste) produced by USU under this alternative would be approximately 1,200 to 1,700 pounds. The increased amount of hazardous waste would be integrated into the existing management and disposal practices on campus complying with all applicable Federal and state regulations, and can be accommodated by the current disposal contractor. Therefore, significant impacts from the increase of hazardous materials and waste at NSA Bethesda are not anticipated.

University Expansion – Regulated Medical Waste

University Expansion – Alternatives 1 and 2: Consolidating off-campus facilities to the new University Expansion facility on NSA Bethesda would increase the amount of RMW produced by the USU. Currently, USU campus facilities produce approximately 2,400 pounds of RMW, while off-site locations produce approximately 500 pounds of regulated waste (both hazardous and medical waste combined). Therefore, it is anticipated that the amount of RMW produced by USU under this alternative would be approximately 2,400 to 2,900 pounds. The increased amount of RMW produced under this alternative would be integrated into the existing management and disposal practices on campus compiling with all applicable Federal and state regulations, and could be accommodated by the current disposal contractor. Therefore, significant impacts from the increase of RMW at NSA Bethesda are not anticipated.

University Expansion – AT/FP

University Expansion – Alternative 1: There is likely sufficient space south of South Palmer Road to adequately meet AT/FP standoff requirements. As with all new construction on NSA Bethesda, AT/FP considerations would be evaluated in the design of the new facilities, and appropriate setback requirements in compliance with UFC antiterrorism standards would be met to the extent practicable. If existing constraints do not allow the standoff distances to be met, then additional blast protection measures, such as building hardening measures, would be incorporated into the building design to meet the minimum standoff distances.

University Expansion – Alternative 2: Both the new facility as well as the parking structure would be located between Buildings 47 and 74. As with all new construction on NSA Bethesda, AT/FP considerations would be evaluated in the design of the new facilities to ensure compliance with the AT/FP standards to the maximum extent possible. Because the parking structure would be located under the new facility, special provision for parking below an occupied building would need to be provided to meet AT/FP criteria so that there would be no impact on human health and safety.

Cumulative Impacts

The Medical Facilities Development and the University Expansion are two components of the 2012 NSA Bethesda Master Plan that DoN is currently updating, and this EIS analyzes the implementation of these components. The 2012 NSA Bethesda Master Plan distinguishes the short-term planned projects and long-term opportunity areas at the installation. Therefore, the EIS evaluates the cumulative impacts of the proposed actions in the context of the short-term planned projects and long-term opportunity areas at the installation. The EIS considers both construction and operation impacts in the context of the cumulative impacts discussion.

The short-term planned projects as defined in the 2012 NSA Bethesda Master Plan include the projects of known scope that address specific plans, goals, or challenges in the near term. These short-term planned projects are: Sanctuary Hall and Garage (WWTL), Child Development Center, Uniformed Services Organization, Navy Lodge Expansion, Helipad Expansion, and Building 20 renovation. The short-term planned projects also include Rockville Pike Crossing, which is a project that will be constructed by Montgomery County and is included in the 2012 NSA Bethesda Master Plan for coordination purposes only.

The 2012 NSA Bethesda Master Plan also identifies the long-term opportunities areas, facilities, or strategies that are not currently planned, but which should be recognized as part of the larger installation improvement context. For the potential future development opportunities, DoN will ensure the appropriate NEPA review is completed at such time as the projects are proposed for implementation. These long-term opportunity areas include: Building 26 AT/FP Renovation; Industrial/Warehouse Area/Fire Station Redevelopment; Kiss and Ride Facility (the project would be outside the NSA Bethesda fence line and Montgomery County would be responsible for this project, not the Navy); Building 54 & 55 (garages) Replacements; Building 50 (Mercy Hall) Redevelopment; G-Lot Medical Expansion; and Structured Parking Opportunities at H-Lot Site, Warehouse Area, Taylor Road Facilities, and N-Lot Site. It should be noted that the locations of H-Lot Site and Taylor Road Facilities are also analyzed in the EIS as alternative sites for an above-ground parking structure as alternatives to the underground parking garage in the Front Lawn. N-Lot site is analyzed in the EIS as Alternative 2 for the University Expansion.

In addition, the EIS analyzes the cumulative impacts from the proposed actions when added to impacts from other Federal, state, and local initiatives, as appropriate. The cumulative impacts analysis of this EIS also includes M-NCPPC approved off-base background development projects in the vicinity of NSA Bethesda during the time period of the proposed actions.

The proposed actions are not expected to result in a significantly greater incremental impact when added to the actions of other projects than what has been estimated for the alternatives in Chapter 5.0.

Table ES-4: Environmental Consequences of Medical Facilities Development

Resource Area	Medical Facilities Development					No Action Alternative
Geology and Topography	Building C would be on developed area. Excavation of approximately 18,810 cubic yards would be needed to prepare the building foundation. No impacts from internal renovations. Minimal impacts from temporary medical facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched for utility lines for temporary medical facilities. Water tanks for the backup water system would cause minimal impacts on geology and topography. Excavation of approximately 1,020 cubic yards would be required. Approximately 50,792 SF or 1.17 acres would be trenched for other utility upgrades. Approximately 300 cubic yards of excavation would be required for the cooling towers. Stoney Creek Trail System would require intensive, localized grading. Approximately 450 cubic yards would be excavated for all the accessibility and appearance improvement projects. External renovations to Building 13 would involve minimal ground disturbance within the area of the existing structure. Excavation of approximately 110 cubic yards would be required. No impacts on geology or topography. No impacts from temporary construction material storage; these areas are already flat and disturbed.	**Underground Garage**	**Warehouse Area Garage**	**H-Lot Garage**	**Taylor Road Facilities Garage**	No impacts.
		Would require rock excavation (approximately 27,400 cubic yards of rippable rock); would interact with groundwater and would require dewatering system. The Front Lawn would be restored after construction; impacts would be minimal.	Located in developed area; minimal impacts. 670 cubic yards of excavation would be needed.	Located in developed area; minimal impacts. 630 cubic yards of excavation would be needed.	Located in developed area; minimal impacts. Excavation comparable to warehouse area garage and H-Lot garage.	
Soils	Building C would be on developed area. Excavation of approximately 18,810 cubic yards would be needed to prepare the building foundation. Temporary and minimal impacts from	**Underground Garage**	**Warehouse Area Garage**	**H-Lot Garage**	**Taylor Road Facilities Garage**	No impacts.
		2.6 acres would be disturbed	Mostly developed area; 0.68 acre	Mostly developed area; 0.9 acre	Mostly developed area; 0.65 acre	

Resource Area	Medical Facilities Development					No Action Alternative
	digging a trench for utility lines for the temporary medical facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched. No impacts anticipated for the internal renovations. Construction from utilities upgrades would have temporary and minimal impact on soils. Approximately 9,255 linear feet, or an area of 37,020 SF (0.85 acre) of soil would be trenched to upgrade or replace the existing condensate utility lines. Approximately 2,463 linear feet, or an area of 9,848 SF (0.23 acre) of soil would be trenched for the water line connection between the proposed backup water tanks and Building 16. An additional 980 linear feet, or 3,920 SF (0.09 acre) would be trenched for electrical upgrades. Approximately 4,450 SF (0.1 acre) of impervious area would result from the demolition and replacement of the cooling towers. Excavation would be required for the water tanks (approximately 1,020 cubic yards). Stoney Creek Trail System would require intensive, localized grading and construction of a new foot-bridge and replacement of an existing bridge, which would disturb soils under the foundations. The total estimated amount of excavation needed for all of the accessibility and appearance improvements projects is approximately 450 cubic yards. Minimal impacts from external renovations to Building 13. Excavation of approximately 110 cubic yards would be required. Minimal and temporary impacts from temporary construction material	during construction; the Front Lawn would be restored after construction; impacts would be minimal. Excavation would be required; see Geology and Topography. General construction permit would minimize impacts.	new impervious surface. General construction permit would minimize impacts. Excavation would be required; see Geology and Topography.	new impervious surface. General construction permit would minimize impacts. Excavation would be required; see Geology and Topography.	new impervious surface. General construction permit would minimize impacts. Excavation would be required; see Geology and Topography.	

Resource Area	Medical Facilities Development					No Action Alternative
	storage; these areas are already disturbed. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures. If any contaminated soils are discovered, they would be remediated in accordance with Federal and state regulations.					
Water Resources	Surface Water Building C would result in 0.2 acre gain in pervious surface because of Buildings 2, 4, 6, 7, and 8 demolitions. New impervious surfaces: 0.14 acre - accessibility and appearance improvements projects, 0.6 acre – water tanks for the backup water system. Pervious pavement would be utilized for the Stoney Creek Trail System improvements, which would minimize impacts. None or minimal impacts on surface water from internal renovations, temporary medical facilities, and Building 13 renovations. Temporary impacts from construction material storage from potential runoff; minimal impacts due to use of BMPs. New impervious surface would increase stormwater runoff and pollutants. An approved Stormwater Management Plan and BMPs would be required to control runoff. Groundwater See parking options. Minimal or no impacts on groundwater from other	**Underground Garage** Surface Water 2.6 acres would be disturbed during construction. Groundwater Would interact with groundwater and dewatering system required. General construction permit would minimize impacts and potential for impacts from oil, grease and antifreeze would be minimized with BMPs and Standard Operating Procedures.	**Warehouse Area Garage** Surface Water Would result in total 0.68 acre of impervious surface (0.1 acre new); mitigation measures similar to underground garage. Operational impacts could result from runoff from petroleum, oils, lubricants, and from vehicles. BMPs and stormwater management controls would minimize impacts. No impacts on floodplains or wetlands. Minimal impacts on groundwater.	**H-Lot Garage** Surface Water Would result in total 0.9 acre of impervious surface (between 0.334 and 0.1 acre of new depending on design); mitigation measures similar to underground garage. Operational impacts would be similar to warehouse area garage. No impacts on floodplains or wetlands. Minimal impacts on groundwater.	**Taylor Road Facilities Garage** Surface Water Would result in total 0.65 acre of impervious surface (0.06 acre new); mitigation measures similar to underground garage. Operational impacts would be similar to warehouse area garage. No impacts on floodplains or wetlands. Minimal impacts on groundwater.	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	project components. Floodplains A portion of Stoney Creek Trail System would be constructed within the 100-year floodplain (but this is not a Federal Emergency Management Agency regulated floodplain); a Maryland Department of the Environment (MDE) permit would be required, and adherence to permit stipulations would minimize impacts. No impacts on floodplains from other project components. Wetlands A small portion of Stoney Creek Trail System would be near potential wetlands; final design layout would avoid the areas to the extent possible and if unavoidable would comply with DoD's no net loss policy. Navy would coordinate with the U.S. Army Corps of Engineers as needed. No impacts on wetlands from other project components.					
Biological Resources	USFWS has determined that, except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project areas for the proposed actions. MDNR has determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites. Should transients be encountered during the construction/demolition process, the Navy would take appropriate actions and comply with requirements under the ESA. Building C would impact 0.1 acre of landscaped vegetation in developed area and would not be significant. Minor impacts on wildlife and wildlife	**Underground Garage** 2.6 acres of the Front Lawn would be disturbed during construction; would be restored to landscaped area after completion. Wildlife, particularly urbanized species that would likely be present, may be temporarily impacted during	**Warehouse Area Garage** 0.05 acre of landscaped lawn and 0.04 acre of forest would be permanently converted to impervious surface; would likely involve the use of vegetative barriers and landscaping.	**H-Lot Garage** 0.3 acre of landscaped lawn and 0.05 acre of forest would be permanently converted to impervious surface; protection measures similar to warehouse garage.	**Taylor Road Facilities Garage** 0.04 acre of landscaped lawn and 0.01 acre of forest would be permanently converted to impervious surface; protection measures similar to warehouse garage.	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	habitat; mainly to urbanized species. Some juvenile or non-mobile species could be permanently lost. None or minimal impacts from internal renovations, construction of temporary medical facilities, and Building 13 renovations. Utilities upgrades would have temporary impacts on landscaped vegetation; wildlife may be temporarily displaced. Some juvenile or non-mobile species could be permanently lost. The accessibility and appearance improvements projects would increase the amount of landscaping on NSA Bethesda. There would be minor vegetation impacts and minor impacts on wildlife and aquatic habitats and species. Temporary construction material storage areas are already disturbed. Only one area contains some grassy vegetation that would be temporarily affected; species inhabiting the area would relocate. Some juvenile or non-mobile species could be permanently lost. Minor operational impacts could occur to wildlife from the Medical Facilities Development. There could be some disturbance to wildlife including migratory birds in some areas, but noise levels would not be expected to increase to a level that would result in permanent disturbance of these species. Impacts on migratory birds overall would be minor.	construction.				

Resource Area	Medical Facilities Development					No Action Alternative
Air Quality	Emissions from the construction and operation of the proposed actions, including any of the parking alternatives do not exceed *de minimis* levels for moderate nonattainment for ozone, nonattainment for $PM_{2.5}$ and CO maintenance and therefore, would not have significant adverse impacts on air quality. The Record of Non-Applicability is included in Appendix B of this EIS. Minor modifications to Title V permit expected due to Building C and parking garage requirements for new emergency generators. No significant impacts from GHGs expected.					No impacts.
Noise	Noise impacts related to traffic would occur in areas already experiencing vehicular noise; therefore, no additional impacts are expected. During construction of Building C, sensitive receptors adjacent to and outside the southern wall of Building 19, and the northern walls of Buildings 9 and 9A would experience noise impacts. Some combination of noise attenuating measures could be needed during construction including scheduling construction activities during business hours. Internal renovations would occur inside existing buildings and would not use heavy construction equipment. No impacts on sensitive receptors. For utilities upgrades, some combination of noise-attenuating measures could be required if construction occurs outside of business hours. It is anticipated that construction would occur during daylight hours, but the contractor could request to work outside of those hours, in compliance with the Montgomery County Noise Control Ordinance. Minor, short-term impacts could occur from accessibility and appearance improvement projects to populations located in the northern extent of Building 19 and Building 63, portions	**Underground Garage**	**Warehouse Area Garage**	**H-Lot Garage**	**Taylor Road Facilities Garage**	No impacts.
		Noise impacts on nearby sensitive receptors not anticipated during construction.	Noise impacts on nearby sensitive receptors not anticipated during construction.	During construction of the H-Lot Parking Garage, Navy Lodge patrons would experience noise impacts. Some combination of noise attenuating measures could be needed during construction including scheduling construction activities during business hours.	Noise impacts on nearby sensitive receptors not anticipated during construction.	

Resource Area	Medical Facilities Development					No Action Alternative
	of the northern extent of Building 9, the southern extent of Building 61, and the western extent of Building 17. If construction would occur less than 50 feet from these buildings and noise levels exceed adopted levels, noise mitigation measures would be required. No significant impacts on sensitive receptors. No impacts from Building 13 renovations. Temporary and intermittent noise from vehicles delivering and picking up construction materials from temporary storage areas are not expected to create significant noise impacts.					
Utility/ Infra-structure	Building C would require a net increase of 10,803 pounds per hour of steam, 1,445 gpm of chilled water, and 1,095 tons of cooling capacity over the existing buildings that would be demolished. Relocation required for utilities lines in crawl space of Buildings 2, 7, and 8. The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers and would ensure no impact on regional service provision. Although Building C is larger than the combined area of the buildings it replaces, it is not expected to have an increased demand for potable water or sewer due largely to the water conservation measures that would be incorporated into the new LEED® Silver designed building. The installation would require 6.5 MVA of additional power for the construction of new facilities, as well as for the proposed upgrades and	**Underground Garage** Power demands for the parking garage alternative (underground or above-ground) would be relatively minor and accommodated within the proposed electrical upgrade. There would be no sewer or natural gas service to the parking garage. Water line would be needed for fire suppression system, and stormwater management systems would be required.	**Warehouse Area Garage** Similar to underground garage. Water line relocation may be required to allow the construction. The specific relocation route is not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers.	**H-Lot Garage** Similar to underground garage. Water and natural gas lines relocation may be required to allow the construction. The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service	**Taylor Road Facilities Garage** Similar to underground garage.	The existing condensate return lines would continue to fail and decrease the overall reliability of the system. The existing electrical and steam, and chilled water systems would not be able to support additional development or redevelopment at the installation.

Resource Area	Medical Facilities Development					No Action Alternative
	renovations. This additional power would be provided through the proposed upgrade in the power capacity. No or minimal impacts from internal renovations. The temporary medical facilities are a replacement of the existing functions within the buildings (2, 4, 6, 7, and 8) to be demolished. Because the temporary medical facilities would not house additional functions beyond what was displaced from these locations, there would be no net change to the utilities associated with the operation of this project. Construction of cooling tower upgrades, and replacement of condensate return lines would all have a positive impact on the steam and chilled water system by increasing the capacity of these systems. Replacement of existing failing condensate lines would eliminate substantial leaks and increase the efficiency of the central steam heating system. Building 13 renovations would result in minor increases in usage for utilities including water, sewer, heating/cooling, telecommunications, and electricity due to the increased occupancy that would result from the renovations. Specific load requirements are not known as design has not progressed; however, it would be accommodated within the upgrades occurring under the proposed actions. The Navy is coordinating with the utilities service providers (Washington Suburban Sanitary Commission [WSSC], Washington Gas, and PEPCO) to ensure that these proposed changes do not affect service delivery to the larger			providers.		

Resource Area	Medical Facilities Development					No Action Alternative
	community by verifying that system can accommodate the additional load.					
Transporta-tion	The proposed action would generate truck trips for transporting of construction materials to the installation and construction and demolition debris for off-site disposal. Operation of any of the components of the Medical Facilities Development would generate between 14 and 17 staff trips during the AM peak hour and between 14 and 16 staff trips during the PM peak hour and would also either shift between 149 and 294 staff trips during the AM peak hour and between 177 and 306 staff trips during the PM peak hour or shift 176 patient trips during the AM peak hour and 83 patient trips during the PM peak hour within the installation roadway network. New staff trips and shifted staff trips would be able to more safely access Building C as a result of the accessibility and appearance improvements. There would be no increase in patient or visitor trips (See Section 2.3). No significant impacts on traffic would occur as a result of any of the components under this proposed action. It is also recommended that the Installation TMP continue to be implemented to reduce the number of vehicle trips on the external and internal roadway system by using the Metro, Montgomery County transit system, vanpools, carpools, and bicycle trails.	**Underground Garage** Patient trips would be shifted to this facility in Traffic Study Alternatives 1, 2, 6, and 7; however, no significant impact on installation roadways would occur.	**Warehouse Area Garage** Staff trips would be shifted to this facility in Traffic Study Alternatives 3 and 8; however, no significant impact on installation roadways would occur.	**H-Lot Garage** Staff trips would be shifted to this facility in Traffic Study Alternatives 4 and 9; however, no significant impact on installation roadways would occur.	**Taylor Road Facilities Garage** Staff trips would be shifted to this facility in Traffic Study Alternatives 5 and 10; however, no significant impact on installation roadways would occur.	Does not add to projected traffic growth.
Cultural Resources	Demolition alone of Buildings 2, 4, 6, 7, and 8 would not have direct impacts on cultural resources because these buildings have all been determined to be ineligible for NRHP. However, the replacement Building C would be	**Underground Garage** No adverse effect is anticipated if ingress/egress on	**Warehouse Area Garage** Determinations of Eligibility for Building 149 and	**H-Lot Garage** No impacts.	**Taylor Road Facilities Garage** DOEs would be required for Buildings 59,	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	attached to the rear or east of the Central Tower Block (Building 1) and be engaged with Buildings 3 and 5. A design parameter has been set that the height of Building C would be generally consistent with the height of the tallest building to be demolished. Future design reviews by MHT and NCPC under their respective legal authorities would be expected to result in the avoidance, minimization, and/or mitigation of any potential adverse effects on the Central Tower Block or Buildings 3 and 5 as historic properties. Internal Renovations: Section 106 would be required only if there are changes to the grand multi-level Art Deco entrance hall of the Central Tower Block; otherwise, the interior renovations would have no adverse effect upon historic properties. Temporary facilities: No adverse impacts. Utilities Upgrades: No adverse impacts. Accessibility and Appearance Improvements: North Palmer Road – Review of the detailed design drawings by MHT and NCPC would be required to ensure avoidance of adverse effects to Building 1, the Lawn, and Building 11, as NRHP resources. Building 17 Connector - Review of design drawings by MHT and NCPC would be required to ensure avoidance of adverse effects to Building 17 and the Flag Quarters. Stoney Creek Trail System - Further archaeological investigations may be required once the bridge footprints and ground disturbance potential of the project have been identified. The appropriate course of action to achieve compliance with the NHPA and other relevant cultural resource laws would	Wood Road at the Building 1 Entrance is sensitively designed in accordance with the Secretary of Interior standards.	152 are underway; preliminary indications are that the two buildings are ineligible; however, the determination process would require concurrence by the MHT before being considered final.		69, and 79 prior to their demolition, and Section 106 consultation with MHT if determined NRHP eligible; no adverse to adjacent historic properties (Flag Quarters and Building 17) are expected because of the limited scale and distance.	

Resource Area	Medical Facilities Development					No Action Alternative
	be determined and implemented by the Navy, following consultation with the MHT. Building 13 Renovation: No adverse effect on cultural resources; Navy would consult with the MHT on the development of a design that would not negatively impact the remaining character defining features such as the fenestration, materials, rhythm of openings, and period details such as the entrance canopy. Construction Material Storage: Some physical impacts on the ground surface, but impacts would be temporary and the areas would be restored to existing conditions. None of the areas fall within any known zone of archaeological sensitivity. The proposed laydown area between the helipad and Navy Exchange is located within an NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.					
Land Use and Aesthetics	All proposed land uses are consistent with current plans and precedence. No direct effects outside the NSA Bethesda boundaries to land use are expected and the proposed actions are consistent with the installation Master Plan. A temporary alteration of the visual character of the G-Lot parking area would occur as a result of the temporary medical facilities; however, these impacts would cease upon completion of construction, and there would be no long-term, permanent impacts on the visual character of these areas. Beneficial impacts on land use and aesthetics are anticipated as a result of the accessibility and appearance improvement projects.	**Underground Garage** Short term visual impacts during construction.	**Warehouse Area Garage** Compatible with their respective functional land use zones and would be visually compatible with surrounding buildings. Short term visual impacts during construction.	**H-Lot Garage** Compatible with their respective functional land use zones and would be visually compatible with surrounding buildings. Short term visual impacts during construction.	**Taylor Road Facilities Garage** Compatible with their respective functional land use zones and would be visually compatible with surrounding buildings. Short term visual impacts during construction.	Accessibility and appearance needs would not be addressed.

Resource Area	Medical Facilities Development					No Action Alternative
	There would be a temporary impact on the visual character from the temporary construction material storage areas; however, these impacts would cease upon completion of construction, and there would be no long-term, permanent impacts on the visual character of these areas. No impacts from internal renovations, Building C, utilities upgrades, and Building 13 renovations.					
Socio-economics	Beneficial economic effects to the local economy would be expected as a result of the proposed action; however, none of the proposed action's alternatives would have a significant impact on the local economy. Construction costs for the Medical Facilities Development depend on the final selection of a parking facility alternative. The proposed action would allow implementation of the FY 2010 NDAA Congressional mandate to achieve the new statutory world-class standards for military medicine at WRNMMC and "right-size" the facilities. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**Underground Garage** Total estimated construction cost for Medical Facilities Development: $629,462,000. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**Warehouse Area Garage** Total estimated construction cost for Medical Facilities Development: $617,648,337. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**H-Lot Garage** Total estimated construction cost for Medical Facilities Development: $617,609,000. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**Taylor Road Facilities Garage** Total estimated construction cost for Medical Facilities Development: $618,484,650. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	"Right-sized" facilities would not be provided. New statutory, world-class standards for military medicine would not be met. There would be no dis-proportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.
Human Health and Safety	Demolition of buildings and internal renovations has the potential for ACM and lead-based paints and increase in hazardous material and hazardous waste; adherence to SOPs and applicable regulations would avoid impacts. The Navy received No Further Action	**Underground Garage** Fuel tank for a backup generator for the dewatering system would be	**Warehouse Area Garage** Fuel tank for backup generator; adherence to SOPs and applicable regulations would	**H-Lot Garage** Fuel tank for backup generator; adherence to SOPs and	**Taylor Road Facilities Garage** Fuel tank for backup generator; adherence to SOPs and	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	determinations for SWMUs 4, 5, and 35. Work plans for remediation have been developed for SWMUs 32 and 33. Development in or around SWMUs or Areas of Concern (AOC) under the RCRA Corrective Action Permit would occur only with concurrence from USEPA.	required; adherence to SOPs and applicable regulations would avoid impacts.	avoid impacts. Building 99 would require the removal of two USTs, one AST and one OWS. Demolition of Building 149 would occur in area of SWMUs 4, 34, 32, and 33; development would occur only with concurrence from the USEPA. Adherence to SOPs and applicable regulations would avoid impacts. Activities at sites designated as SWMUs/AOCs would occur only with USEPA concurrence.	applicable regulations would avoid impacts.	applicable regulations would avoid impacts. Demolition of Building 53 would require the removal of one UST and one AST; Building 53 includes AOC 2 and occur in the vicinity of SWMU 5. AOC 2 covers multiple sites, including the area at Taylor Road, and overall clean-up actions are ongoing. The Taylor Road area is finished and full close-out of AOC is anticipated prior to ROD signature. Demolition of two buildings that may contain lead-based paints or ACM would occur. Demolition of Building 53. Adherence to SOPs and applicable regulations would avoid impacts. Activities at sites designated as SWMUs/AOCs would occur only with USEPA	

Resource Area	Medical Facilities Development					No Action Alternative
					concurrence	
Cumulative Impacts	Not expected to have incremental impacts significantly greater than those determined in the assessment of the proposed actions.	**Underground Garage** Not expected to have incremental impacts significantly greater than those determined in the assessment of the proposed actions.	**Warehouse Area Garage** Same as underground parking garage alternative.	**H-Lot Garage** Same as underground parking garage alternative.	**Taylor Road Facilities Garage** Same as underground parking garage alternative.	No impacts.

Table ES-5: Environmental Consequences of University Expansion

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
Geology, Topography, and Soils	Site has greater than 15 percent slopes; extensive cut and fill and grading would be required for construction; 2.8 acres of soils would be disturbed for construction. Approximately 1,115 linear feet, or an area of approximately 4,460 SF (0.1 acre) would need to be trenched for associated utilities upgrades. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures.	Site mostly developed and has a parking lot; between 0.6 and 1.6 additional acres of soil would be disturbed for construction. Approximately 500 linear feet, or an area of approximately 2,000 SF (0.05 acre) would need to be trenched for associated utilities upgrades. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures.	No impacts.
Water Resources	Would result in 2.8 acres of new impervious surface in a previously forested area. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures. The increase in impervious surface could increase both the volume of stormwater runoff and the amount of sediments and pollutants transported offsite. However,	Between 0.6 and 1.6 acres new pervious surface in a mostly developed area. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures. This site is located less than 200 feet south of Stony Creek; therefore, NSA Bethesda would ensure strict adherence to the BMPs and SOPs with planning and stormwater management improvements to minimize direct impacts on	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	the LID required by the new stormwater regulations is intended to minimize impacts occurring as a result of impervious footprints. Stormwater controls would also be implemented for the proposed action. University Pond could also be used as a stormwater control for the new site. However, use of this basin to accommodate runoff from the site would have to be specifically considered during the Maryland Department of the Environment (MDE) permitting process. Increases in parking would increase the amount of oil, grease, and antifreeze that could be carried into the waters through runoff, affecting the water quality of Stoney Creek. However, the potential for runoff of oil, grease, and antifreeze would be minimized by following BMPs and SOPs with planning and stormwater management improvements. The conversion of forested area to impervious surfaces would permanently impact the previously undisturbed infiltration area. However, NSA Bethesda would ensure that precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system. This alternative site is not located within the Stoney Creek floodplain.	surface waters. These impacts are anticipated to be minor. The proposed construction activities, the increase in impervious area, and new parking facilities would all generate small quantities of pollutants such as petroleum, oils, and lubricants that would be treated when proper water quality controls are implemented during construction and once the facilities become operational. This site is not located within the Stoney Creek floodplain or near the potential wetlands at NSA Bethesda.	
Biological Resources	Up to 4.2 acres of forested area and trails could be impacted. The loss of forested area would result in a direct loss of wildlife and wildlife habitat. No impacts on threatened and endangered species (see Biological Resources, Medical Facilities Development).	Up to 1.7 acres of landscaping and 0.3 acre with scattered trees could be impacted. Wildlife impacts in the area would be minimal. No impacts on threatened and endangered species (see Biological Resources, Medical Facilities Development).	No impacts.
Air Quality	Emissions from the construction and operation of the proposed actions, including any of the parking alternatives do not exceed *de minimis* levels for moderate nonattainment for ozone, nonattainment for PM2.5 nonattainment and CO maintenance and would have no	Same as Alternative 1.	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	significant adverse impacts on air quality. The Record of Non-Applicability is included in Appendix B of this EIS. Minor modifications to Title V permit could occur for potential parking garage emergency generator. No significant impacts from GHGs expected.		
Noise	Noise impacts related to traffic would occur in areas already experiencing vehicular noise and would not be expected to cause additional impacts. Noise impacts not anticipated during construction.	Noise impacts related to traffic would occur in areas already experiencing vehicular noise and would not be expected to cause additional impacts. During construction, noise impacts expected at the western wall of the University and at AFRRI. Some combination of noise attenuating measures could be needed during construction including scheduling construction activities during business hours.	No impacts.
Utilities/ Infrastructure	The proposed action would increase USU's demand for power, telecommunications, potable water, sewage treatment, and natural gas. There is sufficient available capacity on the data and telecommunications systems to support expansion of the University without adverse impacts on existing users. There is ample available capacity to support power demands of the University Expansion alternatives via an independent feeder that supplies electricity to the USU and AFRRI complexes. However, the Navy will coordinate with PEPCO to confirm the capacity once the design work is completed and the exact utility requirements are known. The increase in demand for natural gas to heat steam for the University Expansion would be minor compared to the overall gas demand on the installation. The Navy is coordinating with Washington Gas on the capacity and because design work in not yet complete, the initial coordination is based on the square feet estimates for	Same as Alternative 1; steam/chilled water utilities would have to travel a shorter distance from the current USU buildings compared to Alternative 1. An existing WSSC sanitary sewer line may have to be relocated for Alternative 2 site.	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	Building F and the parking garage. The Navy will confirm the capacity once the design work is completed and the exact requirements are known. Based on the building sizes for Building F and the parking garage, the University Expansion is expected to increase the demand for potable water by approximately 20,460 gallons per day (gpd). A WSSC sanitary sewer line currently exists adjacent to each of the alternative University Expansion sites. The expansion is expected to increase the demand for sewer service by approximately 20,460 gpd. The Navy is coordinating with WSSC on the capacity. The Navy will confirm the capacity once the design work is completed and the exact requirements are known. Either location for the University Expansion would require stormwater management systems and mitigation measures to comply with Maryland Stormwater Management Guidelines for state and Federal projects. Steam/chilled water utilities would have to travel a longer distance from the current USU buildings compared to Alternative 2. The Navy is also coordinating with the service providers to ensure that these proposed changes do not affect service delivery to the larger community by verifying that system can accommodate the additional load.		
Transportation	The proposed action would generate truck trips for transporting construction materials to the installation and construction and demolition debris for off-site disposal. Operation of the University Expansion would generate between 135 and 161 new staff trips during the AM peak hour and between 163 and 193 new staff trips during the PM peak hour within the installation roadway network. There would be no	Same as Alternative 1.	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	increase in visitor trips (See Section 2.3). No significant impacts on traffic would occur as a result of any of the components under this proposed action. It is also recommended that the Installation TMP continue to be implemented to reduce the number of vehicle trips on the external and internal roadway system by using the Metro, Montgomery County transit system, vanpools, carpools, and bicycle trails.		
Cultural Resources	No impacts are anticipated. Phase I Archaeological Survey was conducted in 2007, and MHT determined that none of the sites found warranted further work to determine NRHP eligibility.	Would not have any adverse impact on the integrity of AFRRI as a historic property or to any other cultural resource. Phase I Archaeological Survey was conducted in 2007, and MHT determined that none of the sites found warranted further work to determine NRHP eligibility.	No impacts.
Land Use and Aesthetics	Forested areas and trails would be impacted and the visual character of the area would be altered and the proposed new structures would have long-term impacts on the existing visual character of the area. NSA Bethesda would ensure that the removal of the forested area would be minimized to the extent possible during the design of this alternative.	The alternative would offer the potential for fostering a continuous campus feel between the two tenants and a direct connection to the AFRRI buildings, where shared laboratories are located. The alternative would not noticeably change the visual character of the area.	No impacts.
Socioeconomics	Beneficial economic effects to the local economy would be expected. The construction spending for this proposed action is estimated to be $252,800,000. The proposed action would provide adequate education and research space to meet Military Health System commitments and address the most recent LCME accreditation requirements for student-centered learning, small-group teaching, and technological innovation. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	Similar to Alternative 1.	The institution would continue to operate sub-optimally with various dispersed departments and activities. Additionally, LCME accreditation of the university would be in jeopardy.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
Human Health and Safety	By moving facilities that currently reside off campus to facilities on campus it is anticipated that the authorized user list of the hazardous materials and hazardous waste would grow. The amount of regulated medical waste produced would also increase. However, the increase would be managed in compliance with all applicable Federal and state regulations and would adhere to the NSA Bethesda Hazmat Program.	Same as Alternative 1. A special provision for parking below the occupied building would need to be provided in order to meet AT/FP criteria so that there would be no impact on human health and safety.	No impacts.

Potential Improvement Measures

The EIS analysis has identified potential improvement measures to reduce impacts on surface waters from potential soil erosion and runoff, for control of fugitive emissions to air, for construction noise, for traffic impacts that would be generated by the action alternatives, and for potential impacts on cultural resources.

Sediment and Erosion Control Measures: Recommended measures to be considered include, but are not limited to, the following:

- Using erosion containment controls such as silt fencing and sediment traps to contain sediment onsite where necessary
- Covering disturbed soil or soil stockpiles with plastic sheeting, jute matting, erosion netting, straw, or other suitable cover material, where applicable
- Inspecting erosion and sediment control BMPs on a regular basis and after each measurable rainfall to ensure that they are functioning properly, and maintain BMPs (repair, clean, etc.) as necessary to ensure that they continue to function properly
- Sequencing BMP installation and removal in relation to the scheduling of earth disturbance activities, prior to, during, and after earth disturbance activities
- Phasing clearing to coincide with construction at a given location to minimize the amount of area exposed to erosion at a given time

Stormwater Management Measures: The following nonstructural stormwater management practices would be considered and applied according to the Maryland Stormwater Design Manual (MDE, 2000) to minimize increases in new development runoff: 1) natural area conservation, 2) disconnection of rooftop runoff, 3) disconnection of non-rooftop runoff, 4) sheet flow to buffers, 5) grass channels, and 6) environmentally sensitive development. LID measures would be among those considered and implemented when practical.

The following structural stormwater management practices would be considered and designed according to the Design Manual (MDE, 2000) to satisfy the applicable minimum control requirements established in Section 4.1 of the Guidelines: 1) stormwater management ponds, 2) stormwater management wetlands, 3) stormwater management infiltration, 4) stormwater management filtering systems, and 5) stormwater management open channel systems.

Areas disturbed outside of the footprints of the new construction would be aerated and reseeded, replanted, and/or re-sodded following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity.

Air Quality Construction Measures: The NSA Bethesda air permit requires all reasonable precautions be taken to prevent particulate matter emissions during construction or demolition. During construction and demolition, fugitive dust would be kept to a minimum by using control methods. These precautions could include, but are not limited to, the following:

- Use, where possible, of water for dust control
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials
- Covering of open equipment for conveying materials
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion
- Employment of a vehicle wash rack to wet loads and wash tires prior to leaving the site

Noise Reduction during Construction: Potential measures to control airborne noise impacts that would be considered and implemented as appropriate include:

- Source limits and performance standards to meet fence line noise level thresholds for daytime, evening, and nighttime hours at sensitive land uses (Montgomery County Standards)
- Designated truck routes
- Establishment of noise-monitoring stations for measuring noise prior to and during construction
- Design considerations and project layout approaches including measures such as construction of temporary noise barriers, placing construction equipment farther from noise-sensitive receptors, and constructing walled enclosures/sheds around especially noisy activities such as pavement breaking
- Sequencing operations to combine especially noisy operations to occur in the same time period
- Alternative construction methods, using special low noise emission level equipment, and selecting and specifying quieter demolition or deconstruction methods

Control measures for sensitive receptors include: sequencing operations, use of alternative construction equipment and methods and instituting other special control measures to reduce the transmission of high noise levels to noise-sensitive areas. A construction phasing plan would be coordinated with patient moves to avoid impacts on patients. Construction would occur during daylight hours. All construction work would be required to ensure compliance with the Montgomery County Noise Ordinance (Note: Standard hours of operation would be approximately 7:00 AM to 3:30 PM; however, the contractor

could request to work outside that timeframe provided the work occurs during daylight hours and complies with the Montgomery County Noise Ordinance).

Compliance with the Occupational Safety and Health Administration standards for occupational noise exposure associated with construction (29 CFR 1926.52) would address the staff and construction workers' hearing protection.

Potential Measures to Address Traffic Impacts: For the bicycle and pedestrian network, there are ample sidewalks, bike racks, and ADA compliant curbing at intersections where new pedestrian trips would occur. Therefore, no mitigation measures are recommended for the bicycle or pedestrian network. However, it is recommended that if one of the 2018 Build Alternatives 6-10 be implemented, signing and pedestrian markings clearly identify an appropriate crossing location between the new parking structure serving Building F and the USU to accommodate the 161 AM peak hour and 193 PM peak hour new pedestrian trips created by the 220 new USU employees.

It is also recommended that the Installation Transportation Management Plan continue to be implemented to reduce the number of vehicle trips on the external and internal roadway system by using the Metro, Montgomery County transit system, vanpools, carpools, and bicycle trails. The sustained implementation of the TMP would continue to ensure that the transportation system in the area functions efficiently.

Human Health and Safety Measures: By following NSA Bethesda SOPs and applicable regulations, no impacts are expected and no additional mitigation measures or improvement measures are required for human health and safety. Activities at sites designated as SWMUs/AOCs would occur only with USEPA concurrence. Remediation activities at these sites, as needed, would commence upon final approval of the work plans. Final close-out of all sites within the potential footprint of the proposed actions are anticipated prior to the ROD.

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1.0 PURPOSE AND NEED

This environmental impact statement (EIS) evaluates the potential environmental impacts of two proposed actions at Naval Support Activity (NSA) Bethesda, Maryland. One proposed action, the Medical Facilities Development, would implement the Congressional mandate in the Fiscal Year (FY) 2010 National Defense Authorization Act (NDAA). The mandate requires that new statutory world-class standards for military medicine are achieved at the Walter Reed National Military Medical Center (WRNMMC). This proposed action would provide enduring facilities commensurate in quality, capability, and condition with those provided by the Base Realignment and Closure (BRAC) investment.

The other proposed action, the University Expansion, would address the space and operational limitations at the Uniformed Services University of the Health Sciences (USU or the University).

The proposed actions would enhance and support but not add to the missions of the installation, medical center, or the University.

The Medical Facilities Development includes:

- the demolition of five hospital buildings and construction of a single 5-story facility and associated parking garage for visitors, patients, and very important persons (VIPs);
- internal renovation of five hospital buildings;
- temporary medical facilities to provide uninterrupted patient care during construction;
- utility capacity upgrades;
- accessibility and appearance improvement projects; and
- external and internal renovations of an administrative building.

The University Expansion includes the construction of a new education/research facility and associated above-ground parking garage at USU and interior renovation of administrative and education space and the ground floors of existing buildings.

This EIS is prepared pursuant to Section (102)(2)(c) of the National Environmental Policy Act (NEPA) of 1969, the regulations implemented by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500 – 1508), Department of the Navy NEPA implementing regulations at 32 CFR Part 775, and OPNAVINST 5090.1C-CH1 (July 2011).

There are no cooperating agencies for the preparation of this EIS.

NSA Bethesda is the action proponent and the Department of Navy (DoN or Navy) is the lead agency for the proposed actions. Joint Task Force National Capital Region Medical (JTF CapMed), WRNMMC, and USU are

tenants of NSA Bethesda. The following sections of Chapter 1.0 provide the background, purpose, and need for the proposed actions. Chapter 1.0 also describes public involvement in the NEPA process, and the regulatory framework that guides the completion of the EIS.

1.1 Location

NSA Bethesda, located north of the Nation's Capital in Bethesda, Maryland, is home to WRNMMC and USU. The 243-acre installation is bounded by Maryland Route 355 (Rockville Pike) to the west, with the National Institutes of Health (NIH) main campus and the Medical Center Metro station located just beyond the roadway to the west; Stone Ridge School of the Sacred Heart (a pre-K to 12 girls school) and residential housing to the north; North Chevy Chase Recreation Center, residential housing, including the state designated Hawkins Lane Historic District, and Rock Creek Park to the east; and Columbia Country Club, residential housing, and parks to the south. Interstate 495 (I-495) and Rock Creek Park are adjacent to the northeastern corner of the installation. Jones Bridge Road is the southern boundary. NSA Bethesda installation boundaries and the immediate surroundings are shown in Figures 1-1 and 1-2.

1.2 Background

NSA Bethesda supports WRNMMC, which is a world-renowned medical facility that is the President's hospital and serves the nation's leaders, warriors (past and present), and their families. WRNMMC is NSA Bethesda's largest tenant. The installation also supports numerous medical, research, health support, and welfare/relief commands in the Military Health System (MHS), including USU. These tenant commands have the goal of providing the full spectrum of medical and recovery services to members of the Armed Forces and their families.

NSA Bethesda was established as the National Naval Medical Center (NNMC) in 1940 and originally comprised the Naval Hospital, Naval Medical School, Naval Dental School, and Naval Medical Research Institute. Historically, the entire installation of NSA Bethesda has been known as NNMC. In May 2010, the Navy changed the management of the installation from the Bureau of Medicine and Surgery to the Commander, Navy Installations Command (CNIC). The entire installation then became NSA Bethesda and the medical center (NNMC) its tenant.

As stated in NSA Bethesda's Commander's Intent - Mission, Vision, Culture and Norms, the installation's mission is to (NAVFAC, 2012a): "…tactically execute efficient and effective shore installation management services and programs in support of mission commanders to enable combat readiness for fleet, fighter, and family. In simple language our sole reason to exist is to support our tenant commands in their pursuit of excellence in patient care, medical research and education. It is important that we support not only those who work at the commands, the staff, but also those who use the commands as well: patients and students."

Figure 1-1: Location of NSA Bethesda

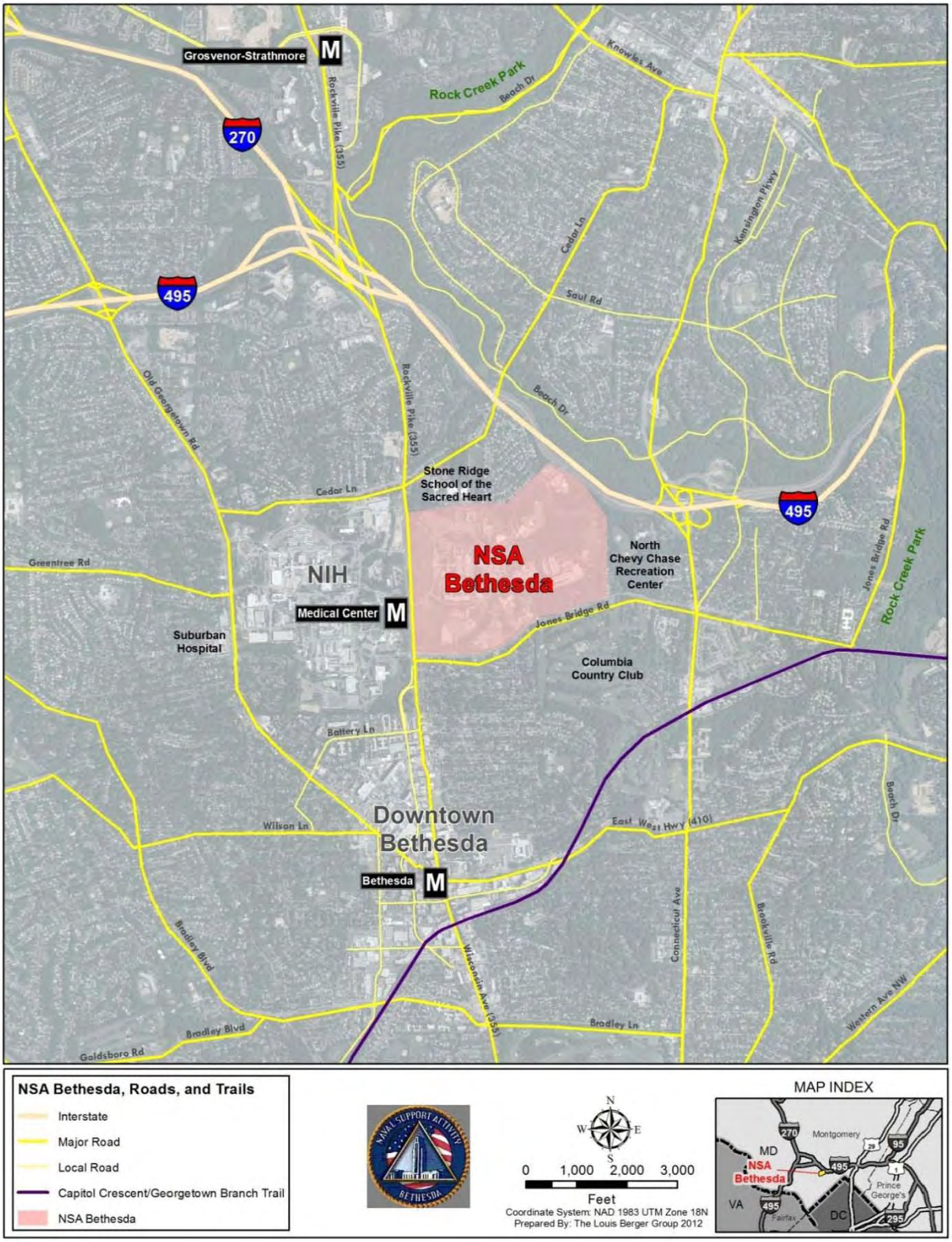


Figure 1-2: Aerial View of NSA Bethesda and Surrounding Area

1.2.1 WRNMMC

NSA Bethesda (the former NNMC) has undergone many expansion and renovation projects over the years to become one of the Department of Defense's (DoD) largest medical facilities. The most recent renovation was intended to fulfill the 2005 BRAC Law mandated relocation of the WRAMC's tertiary (sub-specialty and complex care) medical services to NNMC.

To accommodate the new joint mission of NMMC, a new outpatient clinic, inpatient clinic, and two parking garages were constructed. A new barracks building was constructed on the northern edge of campus to house the arriving population of wounded warriors from WRAMC. Building 17 was expanded to include a new fitness center and garage and the National Intrepid Center of Excellence (NICOE) was established to research and treat traumatic brain injuries (TBI) and Post Traumatic Stress Disorder. Three new Fisher Houses were built to house the families of those receiving care at the hospital. Security and circulation improvements included renovations of each gate, relocation of the commercial vehicle inspection facility, and the widening of the perimeter road to alleviate truck congestion through the core of the campus. This construction took place between 2008 and 2011 to meet the BRAC-mandated deadline that required relocation be completed by 15 September 2011.

With the transfer and integration of WRAMC tertiary (sub-specialty and complex care) medical services with existing functions on 15 September 2011, NNMC became WRNMMC. WRNMMC is part of the military's National Capital Region (NCR) Medical and is NSA Bethesda's largest tenant. The center is the premier DoD medical facility offering intensive and complex specialty and subspecialty medical services for the most seriously injured personnel from all military services, and is the major medical referral center for DoD. WRNMMC also provides training and post-graduate level education to the military medical community and serves as a critical medical research center.

The JTF CapMed Commander has Operational Control authority to organize and employ commands and forces to accomplish assigned missions at WRNMMC (JTF CapMed, 2011). JTF CapMed was created to ensure the effective and efficient delivery of world-class healthcare and the consolidation and realignment of military healthcare in the NCR in accordance with BRAC. The JTF CapMed Commander serves as the single, senior medical officer in the NCR and directs healthcare delivery and operations through Flag/General Officer Component Commanders from the Navy, Army, and Air Force medical departments. The Flag/General Officer Component Commanders have Tactical Control of the day-to-day operations of their military healthcare units including the hospitals and clinics in the NCR (JTF CapMed, 2011).

NSA Bethesda supports the hospital mission of WRNMMC through an Installation Support Agreement to provide patients with a seamless and

robust network of recovery and support services that align with the newly defined world-class standard (NAVFAC, 2012a).

1.2.2 USU

USU is another major tenant at NSA Bethesda and is a component of the Military Health System. The institution is the nation's only fully accredited Federal School of Medicine and Graduate School of Nursing. Called the West Point of Medicine, USU was chartered by an act of Congress on 21 September 1972, and has the unique mission to provide the nation with health professionals dedicated to career service in DoD and the U.S. Public Health Service.

USU's mission statement (NAVFAC, 2012a) is: "The Uniformed Services University is the Nation's federal health sciences university and is committed to excellence in military medicine and public health during peace and war. We provide the Nation with health professionals dedicated to career service in the Department of Defense and the United States Public Health Service and with scientists who serve the common good.

We serve the uniformed services and the Nation as an outstanding academic health sciences center with a worldwide perspective for education, research, service and consultation; we are unique in relating these activities to military medicine, disaster medicine and military medical readiness."

Currently, USU is engaged in an ambitious plan to become the core academic health research center of WRNMMC and create a stronger, more effective military medical system (USU, 2011).

1.2.3 World Class Medical Facility

Beginning in 1990, when the installation was still NNMC, the goal of its Master Plan was to stabilize patient care operations and provide increased access to patient services. The 2008 NNMC Master Plan update provided a logical basis and a framework for the anticipated development throughout the installation to fulfill the requirements of the 2005 BRAC mandated relocation, which transitioned four inpatient hospitals into two and concluded in September 2011.

In May 2008, the NCR BRAC Health Systems Advisory Subcommittee (HSAS) of the Defense Health Board (DHB) was convened to advise DoD on the planned integration of military medical facilities in the NCR.

In October 2008, NDAA 2009 required an independent review to determine whether plans for WRNMMC and Fort Belvoir Community Hospital (FBCH) would provide world-class medical facilities. This review was performed by the DHB HSAS, which subsequently published its report in May 2009 titled "Achieving World-Class, an Independent Review of the Design Plans for the Walter Reed National Military Medical Center and the Fort Belvoir Community Hospital." In its report, the DHB developed an operational definition for a "world-class medical facility" and

identified several areas where the plans for WRNMMC facilities did not meet this standard. As required by the NDAA 2009, it also provided recommendations to address these areas, to include:

- Full conversion to single-patient rooms (DoD standard 250 SF for family members to visit, wheel chair access, etc.);
- Expand size of the operating suites and other areas to accommodate current and future medical technologies;
- Develop Information Management and Information Technology infrastructure that is interoperable and supports the latest medical technologies;
- Expand support services and patient amenities (food service, day care, parking, wayfinding, etc.); and
- Expand on-site simulation capability to maintain the skills of clinicians.

In October 2009, the NDAA 2010 codified the DHB's operational definition for a "world-class medical facility" and required the Secretary of Defense to "develop and implement a comprehensive master plan (CMP) to provide sufficient world-class military medical facilities and an integrated system of healthcare delivery for the NCR." The law specifically required the CMP to include a program to address facility requirements as identified by a facilities needs assessment. It also required the CMP to incorporate "all ancillary and support facilities at the National Naval Medical Center, Bethesda, Maryland, including education and research facilities as well as centers of excellence, transportation, and parking structures required to provide a full range of adequate care and services for members of the Armed Forces and their families."

In April 2010, the Deputy Secretary of Defense provided Congress with the required CMP, and a Supplement to the CMP in August 2010. Among other items, the CMP identified approximately $800 Million in post-BRAC facility projects (FY 2012 – FY 2018) required at Bethesda to achieve "world-class" facility standards. A WRNMMC Medical Facilities Master Plan was developed to further refine the facility projects discussed in the CMP and to ensure they fully met the intent of the law.

In addition to the CMP and WRNMMC Medical Facilities Master Plan, there are other efforts such as the 2011 Accessibility Plan to meet different and specific needs at NSA Bethesda. The Accessibility Plan was prepared to support NSA Bethesda's vital role in the care of wounded warriors and with the general goal of providing a universally accessible campus for its tenants. This study identified and quantified challenges to accessibility, developed a strategy for

implementing universal accessibility, and provided recommendations for establishing accessible routes and zones within the campus.

1.3 Purpose and Need

The following discussion identifies the purpose and need for the proposed actions evaluated in this EIS.

1.3.1 Medical Facilities Development

The purpose of the Medical Facilities Development is to implement the FY 2010 NDAA Congressional mandate to achieve the new statutory world-class standards for military medicine at WRNMMC. This would be accomplished by providing enduring facilities commensurate in quality, capability, and condition with those provided by the BRAC investment.

Medical Facilities Development is needed because current space is insufficient to meet world-class standards, including decompression to single occupancy patient rooms (converting semi-private rooms to single rooms to meet DoD standard), a state-of-the-art simulation center, and a health innovation center. It is important to reiterate that the Medical Facilities Development would enhance, support, and improve the quality of healthcare service delivery but not add to the mission of WRNMMC.

The purpose of and need for the Medical Facilities Development were identified subsequent to the programming for BRAC 2005. The BRAC 2005 construction was specifically designed to accommodate the transfer of WRAMC to WRNMMC, and restricted BRAC funding to projects related to accommodating BRAC relocation. Therefore, parts of the medical center did not undergo renovation or improvements during BRAC construction because that program was never intended to address the mission capability or functionality of the existing infrastructure.

As discussed in Section 1.2.3, the requirements identification for the Medical Facilities Development was initiated in the 2009 DHB study and culminated in the CMP and WRNMMC Medical Facilities Master Plan. The WRNMMC Medical Facilities Master Plan provides a long-range plan subsequent to BRAC 2005 construction and identifies facility, infrastructure, and technology requirements to achieve the goals of a world-class academic medical facility, including the current military space standards (NAVFAC, 2011a). These recommendations would address the Joint Commission on Accreditation of Healthcare Organizations' hospital design standards. The WRNMMC Master Plan recommendations were made to meet several healthcare delivery objectives including: maintaining a focus on patient-centered care through adopting the medical home concept, expanding access to care, upholding high patient satisfaction, and focusing service and space on wounded warriors.

Based on the recommendations in the WRNMMC Medical Facilities Master Plan, the proposed Medical Facilities Development would provide required space in two categories: (1) right-sizing existing departments in the existing hospital to meet military standards, and

(2) replacing existing facilities with new construction to meet current space and healthcare operational standards. These developments would decompress medical and support activities that currently operate in spaces that do not meet military standards. A requirement of the right-sizing is to increase the number of private rooms for patient care; in order to accommodate the same number of beds in this new configuration, other departments would be relocated.

The Medical Facilities Development would allow space for in-fill development for consolidating units to better serve the patient population, such as a consolidated Women's Health Center. The development would also provide space for world-class features such as a state-of-the-art simulation center and a health innovation center.

To enhance the operations of WRNMMC, the Medical Facilities Master Plan proposes a parking garage for visitors, patients, and VIPs to serve the medical facilities and the overall unmet parking needs across NSA Bethesda. The 2008 Transportation Management Plan (TMP) calculated the NCPC-defined staff parking ratio (1:3) plus the Unified Facilities Criteria (UFC) non-staff parking needs equating to demand for 8,903 parking spaces. The current available parking at the installation is 7,686 spaces, which results in a 1,217-space deficit. The construction of the proposed parking garage would reduce the parking space deficit and still comply with the NCPC staff parking ratio.

As part of the Medical Facilities Development, the 2011 WRNMMC Medical Facilities Master Plan proposes several utility upgrades at NSA Bethesda. The purpose of the utility improvements is to support the healthcare delivery facilities at NSA Bethesda. The proposed utility improvements are needed because at the conclusion of the BRAC 2005 construction, utility capacity at NSA Bethesda was essentially at equilibrium, with only a small margin of excess capacity. The WRNMMC Master Plan concluded that any development of future facilities would require additional electrical capacity and that a large percentage of utility services at NSA Bethesda are either nearing capacity or are in need of significant repair.

The purpose of the accessibility and appearance improvement projects is to provide accessible and aesthetically pleasing pedestrian pathways focused on wounded warriors, their special needs, and the staff helping them to adjust to their new challenges. These projects are needed because currently there are deficiencies in existing pathways or a lack of pathways that make areas of the installation inaccessible to wounded warriors and other disabled patients. These projects are based on the recommendations from the 2011 Accessibility Plan as well as the 2010 Installation Appearance Plan (IAP), which includes the official direction and guidance for designing, developing, and reviewing all physical development (including new construction and exterior renovation) at NSA Bethesda).

The purpose of Building 13 internal and external renovations is to convert the current storage facility to administrative space. Renovations to Building 13 are needed to provide a consolidated location for security services currently in dispersed space at NSA Bethesda. The renovations are also needed to provide permanent space for the staff currently in temporary trailer space.

1.3.2 University Expansion

The primary purpose of the University Expansion is to provide adequate education and research space to meet MHS commitments to deliver training and post-graduate level education to the military medical community and enable USU to serve as the core academic health research center at WRNMMC (USU, 2010). USU is the academic locus of MHS and its product lines impact every face of healthcare delivery in MHS. The purpose of the University Expansion is also to address the most recent Liaison Committee on Medical Education (LCME) accreditation requirements that entail the institution providing additional space for student-centered learning, small-group teaching, and technological innovation (USU, 2010).

The University Expansion would support increases in classroom and laboratory space, LCME requirements for class size, and research space needs. It would also accommodate the consolidation of dispersed off-site functions. The University Expansion would directly support strategic alignment within MHS by improving efficiency in teaching medical, nursing, and biomedical science students; by producing research; and by augmenting WRNMMC as a world-renowned biomedical research, education, and patient care facility (USU, 2011).

The University Expansion is needed because USU operations, including the Center for Disaster and Humanitarian Medicine, Center for Study of Traumatic Stress, Center for Neuroscience and Regenerative Medicine, Center for Prostrate Disease Research, Tri-Service Nursing Research Program, National Center for Disaster Medicine and Public Health and National Capital Area Simulation Center are currently dispersed between the main USU buildings and 19 facilities comprising off-site leased locations in Montgomery County, Maryland and other dispersed buildings on NSA Bethesda. The Capital Investment Review Board concluded that relative to programmatic growth at the School of Medicine, other than the Graduate School of Nursing, there has been a lack of major capital investments at USU since its establishment. This lack of investment has resulted in the aging and inadequate infrastructure and dispersed operational spaces that constrain optimal performance as an integrated medical education and research delivery activity (USU, 2010). The expansion is needed the existing USU campus is at capacity and the institution will continue to attempt to meet its mission with operations in dispersed locations. The expansion is also needed to provide the education space to meet the most recent LCME class size requirements. These requirements cannot be achieved with the current classrooms because they were built under past size requirements that did not emphasize small-group teaching and current

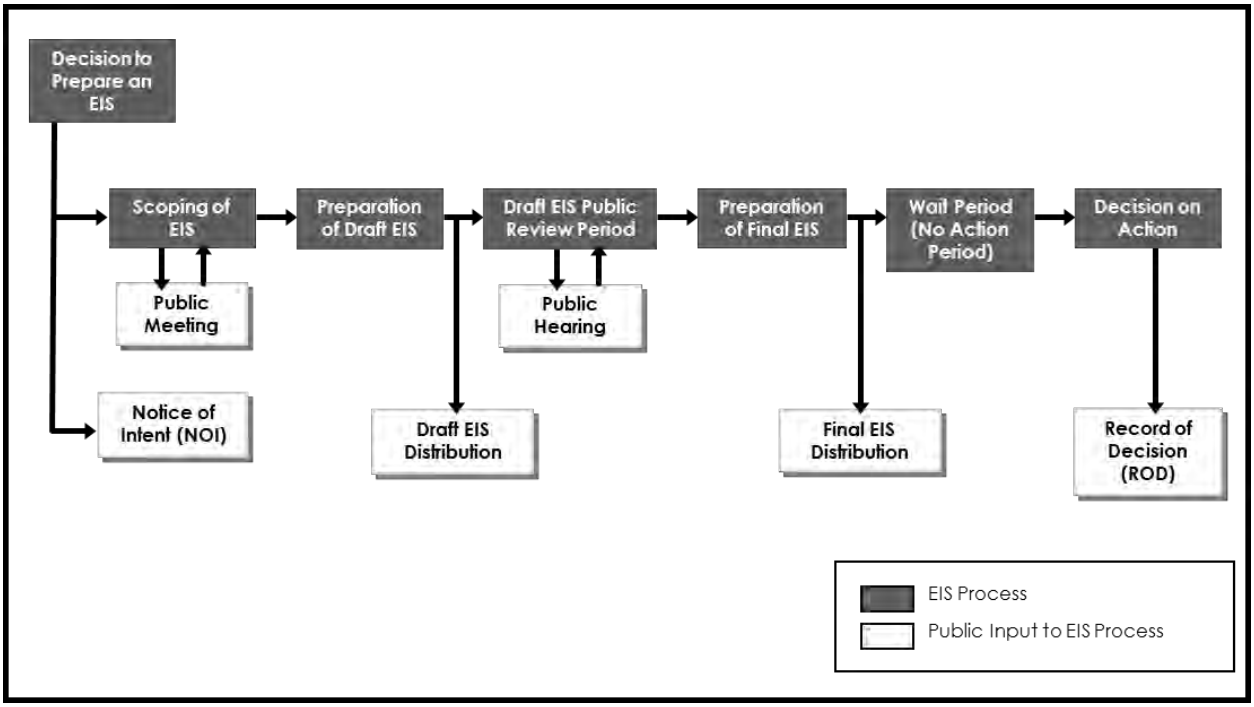
technological innovation. Finally, the expansion is needed to allow students and staff unfettered access to the primary assets of USU, its people, and interactions available on campus.

1.3.3 NEPA Process

NEPA, the basic national charter for inclusion of environmental considerations and for the protection of the environment in decision-making, is binding on all Federal agencies. NEPA created CEQ, which published implementing regulations for NEPA in Title 40 Code of Federal Regulations (CFR), Parts 1500-1508. Specific to the Navy, 32 CFR Part 775 *Procedures for Implementing the National Environmental Policy Act* provides the regulations to implement the provisions of NEPA. The Navy provides additional guidance in OPNAVINST 5090.1C-CH1 (July 2011). These implementing regulations and guidance describe the NEPA process as intending to help public officials make decisions that are based on the understanding of environmental impacts, and identify and assess reasonable alternatives to proposed actions to avoid or minimize adverse environmental effects. Throughout the NEPA process, all Federal agencies are required to consider the impact of their proposed activities, programs, and projects on the quality of the human and natural environment.

The NEPA process is illustrated in Figure 1-3.

Figure 1-3: The EIS Process



1.3.4 Public Involvement

The implementing regulations for NEPA require public involvement in the preparation of a Draft and Final EIS. The NEPA decision-making

process allows for disclosure of Federal actions and alternatives to the public through the scoping process. Public involvement occurs through all stages of the NEPA process, including environmental analysis, EIS preparation, and revision. The white boxes in Figure 1-3 indicate the points where public involvement occurs.

The Navy invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having a potential interest in the proposed actions are urged to participate in the decision-making process.

NSA Bethesda is committed to providing information to the public in a timely and effective manner, consistent with the ongoing community outreach efforts pertaining to BRAC and non-BRAC construction projects.

1.3.5 Scoping Period

To ensure that the full range of issues related to the proposed actions were addressed, the Navy published a Notice of Intent (NOI) to prepare an EIS in the Federal Register on 19 August 2011. The Federal Register publication initiated a 46-day scoping period that began on 19 August 2011, and ended on 3 October 2011. The NOI provided general information on the Navy's proposed actions, an announcement of public scoping meetings, and contact information for providing comments. The Navy also placed notices in the local newspapers: the Washington Post (August 25, 26, and 27), the Washington Times (August 26, 29, and 30), and Montgomery County Gazette (August 29 – Gaithersburg, Bethesda, Potomac, and Rockville). Notices of the public scoping meetings were mailed to 697 local community associations and members of the general public as well as 70 Federal, state, local government entities and elected officials. The notice was also posted on the project website: http://www.bethesda.med.navy.mil/nsa/eis.aspx. Appendix A of this EIS includes the list of Federal, state, and local agencies/representatives that were informed of the proposed actions and the scoping meetings.

During the 46-day scoping period, the public was invited to provide comments on environmental issues that should be considered in the development and analysis of alternatives. Comments were accepted at the public scoping meetings, as well as by mail, email, project website, or telephone.

Two public scoping meetings were held at the Pooks Hills Marriott in Bethesda, Maryland on the following days:

- 7 September 2011, 5 PM to 9 PM.
- 12 September 2011, 1 PM to 5 PM.

The public scoping meetings were a combination of an open house and formal presentation. The first portion of the meeting was in an open house format, where information on the proposed actions was displayed on poster boards and knowledgeable Navy representatives were available to answer questions. The open house session was followed with a presentation by the Navy and a public hearing session, which was transcribed by a court reporter. Appendix A includes a matrix that presents the scoping comments and responses to them.

1.3.5.1 Results of Public Scoping Period

A total of 41 persons attended the two public scoping meetings. The attendees included representatives from Federal, state, and local agencies, NIH, community organizations, neighborhood associations, and residents of surrounding neighborhoods. Representatives of the offices of the United States Congress, Maryland General Assembly, Montgomery County Council, and Montgomery County Executive Office also attended the public scoping meetings.

One comment card was submitted during the two public scoping meetings and one commenter provided comments to a Navy representative. A total of six attendees provided verbal comments during the two meetings. Additionally, 11 commenters provided comments via email and 3 commenters provided comments via mail. No comments were received via telephone.

The majority of the comments from the state and local agencies and the local residents reflected concerns for the potential traffic increase in an already highly congested area. The comments can be grouped into the following major categories:

- Transportation Issues
- Air Quality
- Noise
- Visual Effects
- Biological Resources
- Cultural Resources

Transportation Comments

The comments on transportation were further grouped into the following subcategories:

- Roadway/Traffic: congestion of main thoroughfares that can affect adjoining neighborhoods, and requests for additional intersections to be included in the traffic study.
- Parking: concerns that an increase in parking spaces at NSA Bethesda would increase traffic.

For the EIS traffic study, the Navy initiated early coordination with the Maryland National Capital Park and Planning Commission (M-NCPPC),

Maryland State Highway Administration (MSHA), and Montgomery County Department of Transportation (MCDOT) to ensure that the agencies were in agreement with the methodology used in the traffic study. The intersections external to NSA Bethesda included in the traffic study were identified based on a preliminary site trip assignment through 17 intersections adjacent to the base, in accordance with M-NCPPC's Local Area Transportation Review (LATR) methodology. This list was expanded to include additional intersections identified by the public during the scoping period. Based on the site trip assignment and coordination with M-NCPPC, the original 17 intersections were determined to capture the majority of the traffic that would be generated by proposed actions; therefore, the additional intersections identified by the public were not included in the traffic study scope (NAVFAC, 2011b and Pers. Comm., M-NCPPC, 2011).

Other Comments

Other comments addressed air quality, noise, visual impacts, construction, property values, biological resources, and cultural resources. Comments on air quality focused on impacts from construction equipment, traffic, and hazardous material from demolition. Comments on noise were related to construction and roadway traffic. Commenters also stated concerns regarding visual impacts from construction and lighting, as well as negative impacts on property values. Other comments focused on biological resources and stated the need to protect forest stands, green space, and screen for construction. Comments on cultural resources were related to Tower 1 and National Register of Historic Places (NRHP) and National Historic Preservation Act (NHPA) Section 106 consultation.

Comments received during the scoping period are included in Appendix A and were considered in preparation of the Draft EIS.

1.3.6 EIS Review

1.3.6.1 Draft EIS

The Navy files the Draft EIS with the United States Environmental Protection Agency (USEPA) and distributes the Draft EIS to pertinent Federal, state, local and private agencies, organizations, and individuals for review and comment. USEPA publishes a Notice of Availability (NOA) of the Draft EIS in the Federal Register commencing the 45-day public comment period. The Navy publishes a Notice of Public Hearing for the Draft EIS in the Federal Register announcing date and location of public hearings held as part of the public comment process. Comments received during the 45-day public comment period will be considered in the Final EIS.

1.3.6.2 Final EIS

The Final EIS would incorporate the comments and information received from review of the Draft EIS and the public hearings. All comments would be addressed by an appropriate response. The Navy would then

file the Final EIS with USEPA and distribute the Final EIS. USEPA would publish a NOA of the Final EIS in the Federal Register commencing a 30-day wait period. Comments received during the 30-day wait period would be considered in reaching the final decision on the proposed action.

1.3.6.3 Record of Decision

Following the 30-day wait period, the Navy will prepare a Record of Decision (ROD) which is a concise summary of the decision made by the Secretary of the Navy or his/her designee from the alternatives presented in a Final EIS. The ROD will state the decision, identify alternatives considered including the alternative that was environmentally preferable, address new substantive comments received from review of the Final EIS that were not previously addressed, and discuss other considerations that influenced the decision. The ROD will also describe the intended implementation of all practical means to avoid impacts resulting from the chosen alternatives, and explain any decision behind the non-implementation of any of these means. Additionally, the ROD will address any monitoring associated with mitigation. Following signature of the ROD, the Navy will publish a NOA of the ROD in the Federal Register."

1.3.7 Agency Coordination

Data collection for this effort relies, in part, on Federal, state, and local agencies and authorities having pertinent information and interest in the EIS process. The Navy anticipates that the majority of concerns will be related to the impacts of the proposed actions on area traffic and historic resources on the installation. Therefore, the Navy is committed to interagency coordination to promote early and continuing involvement to support the quick resolution of issues, and to better evaluate the alternatives and identify mitigation measures.

To this end, the Navy initiated early coordination with the various Federal, state, and local agencies. To ensure effective collaboration and communication, the Navy initiated coordination with the Maryland Historical Trust (MHT) and the National Capital Planning Commission (NCPC) early in the EIS process. After EIS NOI publication, the Navy initiated formal Section 106 consultation with MHT and the Advisory Council on Historic Preservation (ACHP). Meetings with some or all of these entities occurred on: 3 November 2010, 9 December 2010, 11 May 2011, 10 November 2011, 8 March 2012, and 21 March 2012. ACHP has responded that based on the documentation provided by the Navy in the early consultation invitation letter dated 17 October 2011, and the presentation during the 10 November 2011, meeting with MHT, NCPC, and ACHP at NSA Bethesda, the agency believes that its participation is not warranted at this stage (ACHP, 2011). However, the agency would have an opportunity to comment on the Draft and Final EIS during the public review periods.

The Navy contacted USFWS and MDNR on 11 October 2011 to request a list of endangered or threatened species that have the potential to occur

at NSA Bethesda. USFWS determined that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project areas for the proposed actions. Therefore, no Biological Assessment or further Section 7 consultation with the service is required (USFWS, 2011). MDNR determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites and therefore, the agency does not have specific comments or requirements pertaining to protection measures at this time (MDNR, 2011).

Additionally, the Navy is coordinating closely with M-NCPPC, MSHA, and MCDOT on the EIS traffic study and is conducting the study in accordance with M-NCPPC's LATR methodology.

1.4 Regulatory Framework

In addressing environmental considerations, the Navy is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental and natural resources management and planning. Statutes include the Clean Air Act, Clean Water Act, Noise Control Act, ESA, NHPA, National Capital Planning Act, Archaeological Resources Protection Act, Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act, and the Energy Independence and Security Act of 2007 (EISA, 2007).

EOs bearing on the proposed actions include EO 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), EO 12088 (Federal Compliance with Pollution Control Standards), EO 12580 (Superfund Implementation), EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), EO 13045 (Protection of Children from Environmental Health Risks and Safety Risks), EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), EO 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), and EO 13514 (Federal Leadership in Environmental, Energy, and Economic Performance). These authorities are addressed in various sections throughout the EIS when relevant to particular environmental resources and conditions. The full text of the laws, regulations, and EOs is available on the Defense Environmental Network and Information Exchange Web site at http://www.denix.osd.mil.

2.0 PROPOSED ACTIONS AND ALTERNATIVES

This section discusses in detail the proposed actions for the Medical Facilities Development, including Medical Facilities Development parking alternatives, and the University Expansion. These proposed actions are two components of the 2012 NSA Bethesda Master Plan that DoN is currently updating, and this EIS analyzes the implementation of these components. The previous NNMC Master Plan, completed in 2008, included the anticipated development associated with BRAC 2005 requirements. The purpose of the 2012 NSA Bethesda Master Plan is to provide an installation-wide framework, with post-BRAC conditions as the baseline, for physical development covering all tenants. In addition to the proposed actions, the 2012 NSA Bethesda Master Plan also reflects ongoing projects previously considered under other NEPA documents and identifies potential future development opportunities at NSA Bethesda. These projects are discussed in Section 2.5, Cumulative Impacts.

2.1 Proposed Actions

2.1.1 Medical Facilities Development

A planning process conducted subsequent to BRAC identified new facility requirements to meet the new statutory standards for world-class military medicine. To fulfill these requirements, WRNMMC would need to add space for the following requirements:

- Adjustment of the space allocation of existing units to be located in a replacement facility, plus program enhancements to be housed in the new facility.
- Decompression of patient rooms from doubles to singles.
- Adjustment of the space allocation of existing units that would remain in place and absorb the space vacated by relocated units.

To add the required space within the existing medical core, NSA Bethesda proposes to demolish existing space and construct new medical facilities as follows (Figure 2-1 and Table 2-1):

- **Demolition**: Buildings 2, 4, 6, 7 and 8 of the main hospital complex comprising approximately 326,000 square feet (SF). These buildings currently house the following services:
    - Clinical: including the dental readiness clinic, infectious diseases, and vision center;
    - Education: including USU, Navy Medicine, Personnel, Training and Education Command, and Simulation Center;
    - Support: including public areas, biomed repair, chaplain, and trauma services.

Figure 2-1: Medical Facilities Development

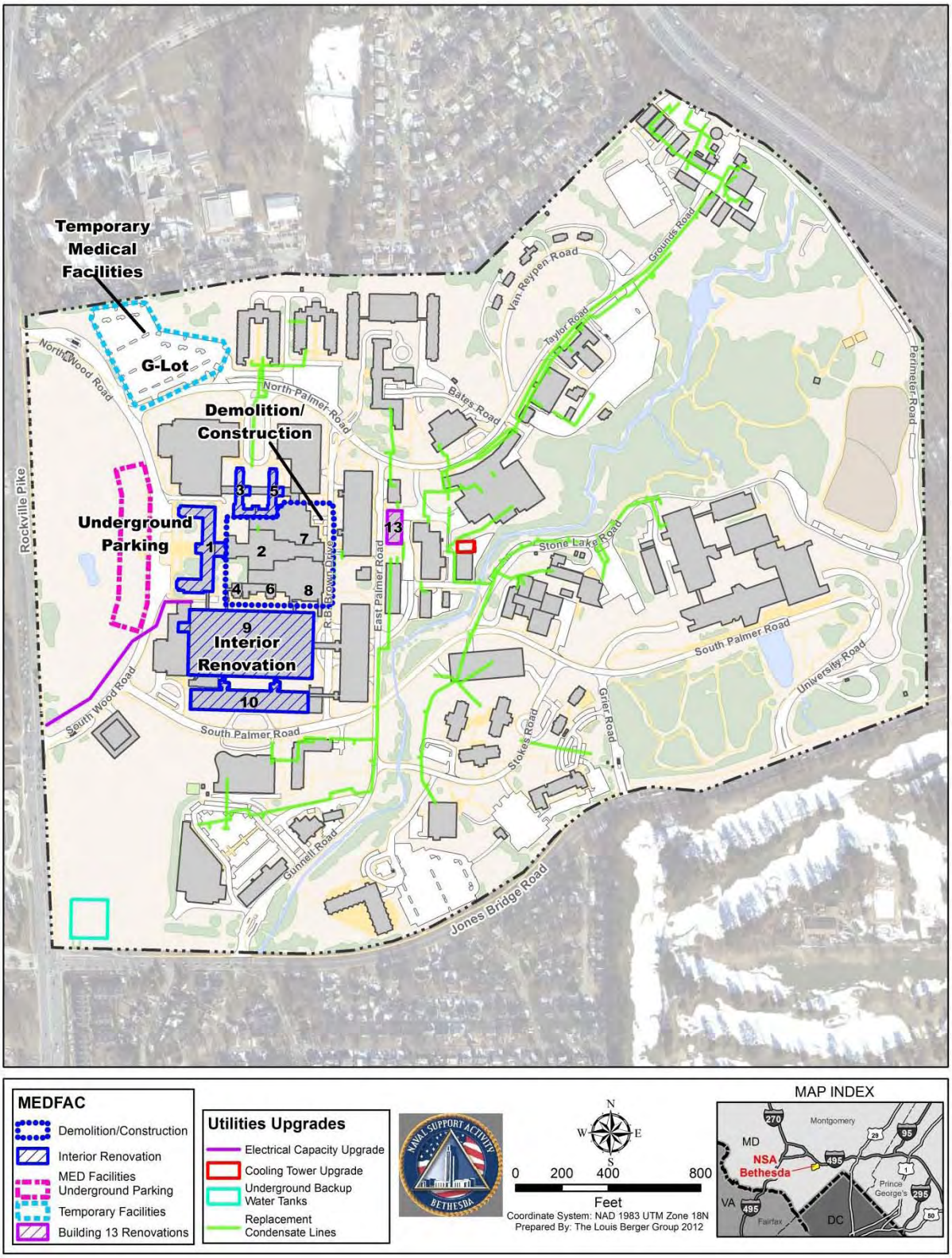


Table 2-1: Medical Facilities Development Requirements

Facility	Medical Facilities Development				
	Construction		Demolition		Renovation
	Total Area (SF)	Footprint (SF)	Total Area (SF)	Footprint (SF)	Area (SF)
[redacted]					
Building C	573,000	113,000			
Buildings 2, 4, 6, 7, and 8 Demolition			325,340	122,708	
[redacted]					
Buildings 1, 3, 5, 9, and 10					120,000
[redacted]					
Underground Parking Garage	225,000	101,500			
[redacted]					
Temporary Medical Facilities at Lot-G		100,000			
[redacted]					
Building 13 Renovations					**18,000**
[redacted]					
TOTAL	**798,000**	**314,500**	**325,340**	**122,708**	**138,000**
Sources: NAVFAC, 2011d, e, f, h, i, j, and k; LBG, 2011a.					

- **Building C Construction:** A 5-story, 573,000 SF single facility (five levels of finished area above grade and one basement level). A portion of the building includes approximately 90,000 SF for setbacks for access to natural light, depending upon the final configuration. The new construction would be in the same basic footprint of the demolished facilities and would be generally consistent with the height of the tallest building to be demolished. The new construction would mostly house the departments from the buildings to be demolished. The relocations would right-size (or provide optimal space) the existing departments. It would also provide space for departments that would be relocated from buildings to be renovated such as Labor/Delivery/Recovery/Postpartum, Neonatal Intensive Care Unit, and Ambulatory Surgery from Building 10. Some program components, such as those located in Building 9 and associated with women's healthcare (such as Urology/Gynecology and Obstetrics/Gynecology) would be relocated to Building C along with Labor/Delivery/Recovery/Postpartum and Neonatal Intensive Care Unit, all forming a new, concentrated women's healthcare center. This movement of departments and clinics would open up available backfill spaces that would relieve spatial pressures elsewhere and provide complementary functions to existing clinics. The new construction would also accommodate program requirements such as a state-of-the-art simulation and education center, a health innovation center, and an hourly child care drop-off center.

It should be noted that the official name of Building C has been changed recently to the Medical Center Addition and Alterations (MCAA); however, for the purposes of the EIS, it will continue to be referred to as Building C.

- **Underground Parking Garage Construction**: The proposed actions include construction of an approximately 225,000 SF, 500-space underground parking garage west of Building 1. This garage would be for visitors, patients, and VIPs and would serve the medical facilities and overall unmet parking needs across NSA Bethesda. This underground site was selected to: 1) provide conveniently located parking relative to the Tower 1 entrance of WRNMMC, 2) minimize the traffic within and around the installation by providing parking convenient to a major entrance, and 3) optimize a site that has no potential alternative mission use. For the underground garage, there are two options under consideration for ingress/egress of vehicles: 1) G-Lot: vehicles would enter G-Lot and access the garage via descending ramps underneath North Wood Road (the ingress/egress would be near, but would not interfere with, the temporary medical facilities), and 2) Wood Road: vehicle ingress/egress points within the current limits of Wood Road at symmetrical locations flanking the Building 1 terraces (the stretch of road below the entrance would remain unencumbered by traffic and reinvigorate the use of the Tower Block's entrance as the historic front door of NSA Bethesda).

- **Medical Facilities Internal Renovations**: Approximately 120,000 SF of currently occupied space in the interiors of Buildings 1, 3, 5, 9, and 10 would be renovated. The renovations would include: converting the spaces vacated by relocating existing departments to the proposed Building C to new single-patient rooms; constructing adjacencies and connections between the adjacent buildings and the proposed Building C; and projects such as roof replacements, mechanical upgrades, elevator repairs, and replacement of door hardware.

- **Temporary Medical Facilities**: Approximately 100,000 SF of temporary medical facilities, including provision of utilities, would be located at G-Lot to provide uninterrupted patient services during construction and renovation. Temporary Medical Facilities would be converted back to parking lot after the completion of Building C.

- **Utilities Upgrades**: The Medical Facilities Development would involve the following utility upgrades.

    - Demolition and reconstruction of three existing cooling towers and construction of a fourth tower, with each tower providing approximately 13,000 gallons per minute (gpm) chilled water capacity. Construction would include five

condenser water pumps, each with an approximate capacity of 9,720 gpm.

- Replacement of deteriorating condensate return lines across the installation.
- Reparation of damaged water lines.
- Provision of backup water supply storage tanks and distribution lines within the installation.
- Doubling the number of the high voltage feeder lines from Potomac Electric Power Company's (PEPCO) Woodmont substation, increasing the installation capacity to 51 mega-volt amperes (MVA).

- **Accessibility and Appearance Improvements Projects:** The Medical Facilities Development would include six of the projects defined in the 2010 IAP (NAVFAC, 2010a). Two of the projects were further refined in the 2011 Accessibility Plan (NAVFAC, 2011c). These projects, shown in Figure 2-2 and listed in Table 2-2, primarily address aesthetic and functional enhancements for high-profile areas of the installation. Most of the six projects involve improvements to existing infrastructure, including widening/realigning sidewalks, installing directional indicators and guides, and additional landscaping. These projects are:
  - North Palmer Road – This project focuses on the areas immediately around Buildings 11, 60, 61, and 62, north of North Palmer Road. It also includes areas adjacent to Building 1.
  - Courtyard – This project adds a variety of plantings for color and texture improvements. New elements include perennials, evergreen shrubs, concrete planters, and water features. The project also includes green screens along the exterior walls to enhance the area.
  - Memorial Grove – This project was refined in the 2011 Accessibility Plan and addresses the severe grade transition from South Palmer Road to East Palmer Road. This area is critical for continued accessibility to the Fisher Houses, Navy Lodge, and Bowling Center because the existing sidewalks associated with the bridges along South Palmer Road are not considered accessible.
  - Building 17 Connector – This project provides a pedestrian pathway to the Fitness Center, JTF, Flag Officer Quarters, and the future Sanctuary Hall and United Service Organization (USO) facilities. Most improvements are along North Palmer Road, Taylor Road, and Van Reypen Road.

Figure 2-2: Medical Facilities Development – Accessibility and Appearance Projects

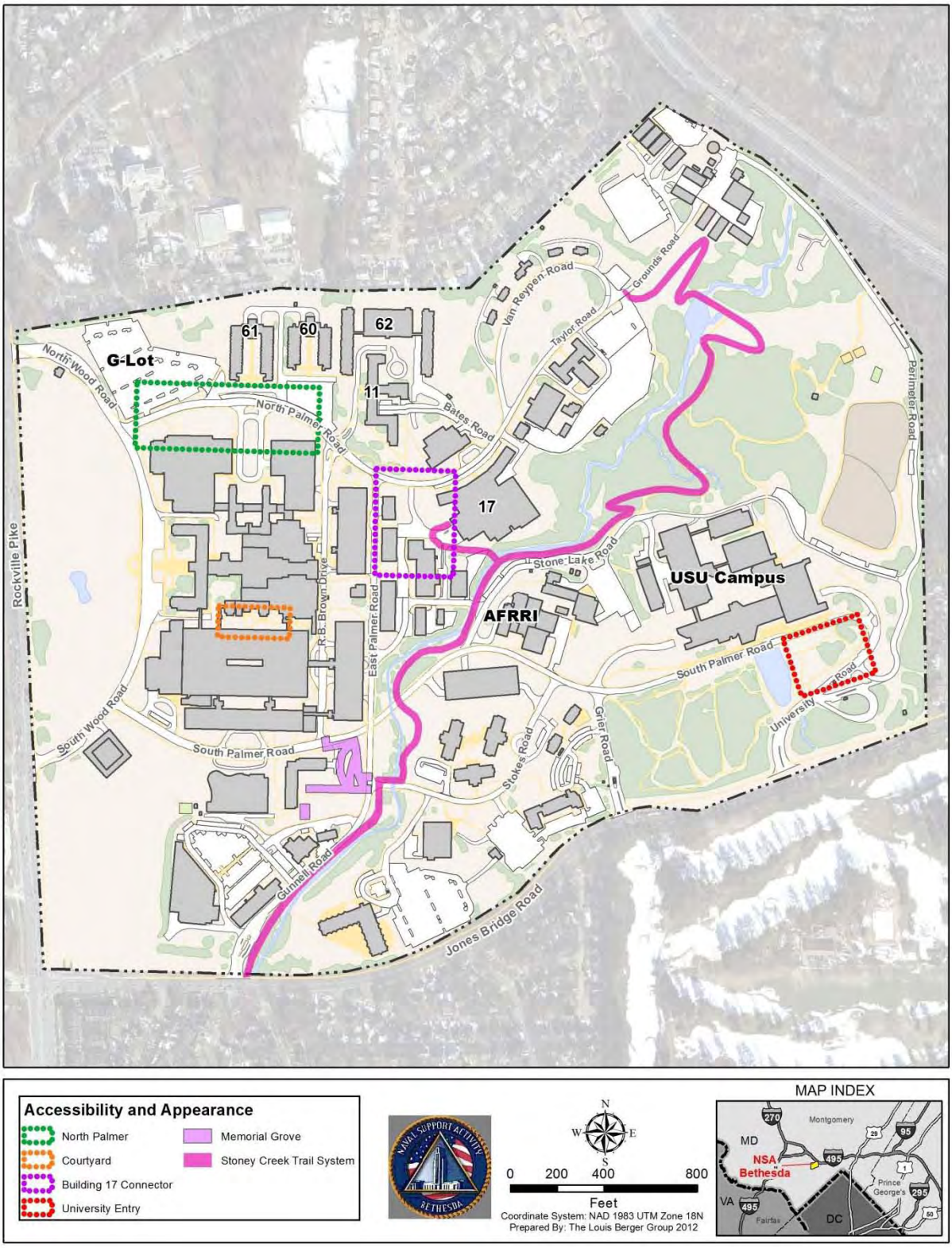


Table 2-2: Medical Facilities Development - Accessibility/ Appearance Improvement Projects

Projects	Construction (SF)	Demolition (SF)
North Palmer Road	3,128	8,595
Courtyard	10,705	21,249
Memorial Grove	3,790	14,256
Building 17 Connector	11,203	10,638
University Entry	8,788	1,512
Stoney Creek	31,802	7,182
TOTAL	**69,416**	**63,432**
Source: NAVFAC, 2011c, and Pers. Comm., Cary, 2012.		

- University Entry - This project provides additional flowering azaleas along the section of University Road near the pond to improve the appearance of this area.
- Stoney Creek Trail System – This project was refined in the 2011 Accessibility Plan and involves a fully accessible, 6-foot wide, asphalt trail that never slopes more than 5 percent and would generally follow the footprint of the existing trail, limiting the amount of associated tree clearing. This project would include one existing and one new bridge over Stoney Creek.

In many areas, these projects surpass the current requirements of the Architectural Barriers Act (ABA) Accessibility Standard for DoD Facilities and Americans with Disabilities Act (ADA) Accessibility Guidelines and are being proposed for implementation per the recommendations in the Accessibility Capital Improvement Plan in the 2011 NSA Bethesda Accessibility Plan.

- **Building 13 Renovations**: Medical Facilities Development includes internal and external renovations of Building 13 and would convert the current storage facility to administrative space. The 2-story building has an area of approximately 18,000 SF (within an approximately 9,000 SF footprint) and is a contributing building to the Historic District at NSA Bethesda. External renovations would include windows/garage door replacements and trimming of the existing the loading dock.

The Medical Facilities Development would incorporate DoD Antiterrorism/Force Protection (AT/FP) standards in accordance with DoD Minimum Antiterrorism Standards for Buildings Unified Facilities Criteria (UFC) 4-010-01 to the maximum extent practicable. Access to all the facilities would comply with ADA and ABA Accessibility Guidelines.

The Energy Policy Act of 2005 (EPAct 2005), EISA 2007, and Executive Orders 13514 and 13423 require the installation to adhere to

sustainable principles. Leadership in Energy and Environmental Design (LEED®) Silver features would be integrated into the design, development, and construction of the projects. Design, development, and construction of Medical Facilities Development would comply with the Low Impact Development (LID) requirements adopted by the Navy to the greatest degree possible.

The proposed action for Medical Facilities Development is the preferred alternative and its implementation would require an estimated 6-year construction period in total for the various components.

2.1.2 University Expansion

The proposed University Expansion would entail the construction of a new, approximately 341,151 SF education and research building, Building F, primarily to consolidate the dispersed 19 departments, centers and activities dispersed in inadequate and temporary spaces at NSA Bethesda or in off-campus leased space in Montgomery County, Maryland. The consolidation of the dispersed off-campus departments would result in termination of lease agreements. Building F would also provide space and infrastructure required to meet LCME accreditation requirements and Military Health System commitments.

The University Expansion would also include an approximately 144,000 SF, 400-space parking structure. This parking structure would accommodate the consolidation of off-site personnel to the University campus and provide needed staff parking at the installation. The University Expansion includes renovating and modernizing approximately 39,000 SF of administrative and educational space in the existing University Buildings (Buildings A, B, C, and the ground floor).

The University Expansion incorporates DoD AT/FP standards in accordance with DoD Minimum Antiterrorism Standards for Buildings UFC 4-010-01 (February 2012) to the maximum extent practicable. Access to all the facilities would comply with ADA and Architectural Barriers Act Accessibility Guidelines.

The EPAct 2005, EISA 2007, and EOs 13514 and 13423 require the installation to adhere to sustainable principles. LEED® Silver features would be integrated into the design, development, and construction of the projects. Design, development, and construction would comply with the LID requirements adopted by the Navy to the greatest degree possible.

Implementation of the University Expansion would require an estimated 2-year construction period for Building F and the parking garage for either of the alternative sites.

2.2 Identification of Alternatives

2.2.1 Medical Facilities Development Alternatives

2.2.1.1 WRNMMC Medical Facilities Master Plan

As discussed in Section 1.3.1, to fulfill NDAA 2010 requirements, JTF CapMed completed a CMP for the NCR and the Medical Facilities Master Plan specific to WRNMMC. Based on the departmental needs anticipated at WRNMMC after the completion of the BRAC-mandated relocations in September 2011, the iterative planning process identified and evaluated alternatives for the Medical Facilities Development, including a parking facility. The CMP development process identified the proposed action as the best approach to meet the Congressional mandate for world-class facilities commensurate in quality, capability, and condition with the BRAC investment.

The planning process identified the following four alternatives for Medical Facilities Development, including a parking facility (NAVFAC, 2011a):

- Alternative 1 - Renovate Existing Buildings (2, 4, 6, 7, and 8) and No New Construction.
- Alternative 2 - Renovate Existing Buildings (2, 4, 6, 7, and 8) and Build Balance of Requirement On-Base.
- Alternative 3 - Renovate Existing Buildings (2, 4, 6, 7, and 8) and Build Balance of Requirement Off-Base.
- Alternative 4 - Demolish Existing Buildings (2, 4, 6, 7, and 8) and Build New Space for Full Requirement, including an underground parking garage in front of Building 1 (The Tower).

The selection criteria used to evaluate the four alternatives were based on the mandates from the DHB Study and 2010 NDAA. These criteria are focused on addressing the conditions after the BRAC projects are completed and the services provided for quantitative and qualitative characteristics of a world-class medical center as mandated (NAVFAC, 2011a).

- Patient Care - Alternative must provide adequate quantity of single patient room; allow on-site separation of inpatient and ambulatory services; provide an improved surgical suite, including operating rooms, support areas, and perioperative flow and configuration; provide adequate space for centers of excellence and clinics; incorporate evidence-based design; include expansion of technology, and allow for operational efficiency.

- Teaching Hospital - Alternative must provide adequate space and infrastructure for Simulation Center design and configuration, classroom and meeting spaces/learning environment, medical center auditorium, and Navy medical manpower personnel training and education.

- Physical Plant – Alternative must provide adequate infrastructure/utilities, sustainability features, infrastructure/facilities parking capacity, and enhanced public support and amenities required.

- Cost Factors - Alternative must provide, based on an 8-year construction period and a 30-year economic life for the facilities, the most economical value over the life of the asset, taking into consideration operational and energy costs in addition to the initial capital investment for construction/renovation.

- Construction Impacts - Alternative must minimize temporary relocation/facilities and disruption to operations.

The 2011 WRNMMC Medical Facilities Master Plan's Section 5.3, (Evaluation of Each Alternative), discusses in detail the application of the evaluation criteria to the four alternatives. Based on the evaluation, Alternative 4 was selected as the preferred alternative. Alternative 4 includes the demolition of the existing buildings (2, 4, 6, 7, and 8) and construction of new space. Alternative 4 was selected because the evaluation results show it being the most able to fulfill the patient care and teaching hospital requirements for world-class facilities in the shortest timeline, to centralize and consolidate the medical center, and to minimize the long-term deferred maintenance costs and anticipated future cost to replace renovated structures.

Common to all four alternatives, the Medical Facilities Development would include an approximate 225,000 SF and 500-space underground parking structure west of Building 1 to provide parking for visitors, patients, and VIPs. This underground site was selected to provide parking located conveniently to the Tower 1 entrance of WRNMMC; minimize the traffic within and around the installation by providing parking convenient to a major entrance; optimize a site that has no potential alternative mission use because of the historic context of Building 1 and the landscape west of it (the viewshed); and minimize the cultural and visual impacts.

2.2.1.2 Medical Facilities Parking Alternatives

Subsequent to the CMP, the Navy identified three locations as alternative sites for the proposed underground parking structure. These alternative sites are shown in Figure 2-3 and involve a 500-space, above-ground parking garage.

- Warehouse Area: This is an existing industrial and warehouse area located in the northeast corner of the installation. It would involve consolidating the warehouse space and outdoor storage area. The parking garage at the site could be up to 6-stories with a footprint of approximately 29,200 SF and would require demolition of Buildings 80, 149, 152, 101, and 99. These buildings currently function as public works shop (80) pavement and garden sheds (101 and 149), general purpose warehouse (152) and filling station (99). Functions of those buildings would be temporarily located to existing facilities on the installation.

- H-Lot: This area is in the southern portion of the installation, near the medical core. The parking garage could be up to 6-stories, consistent with the adjacent Navy Lodge height, with a footprint of approximately 39,100 SF and would require removal of the existing parking pavement.

- Taylor Road Facilities: This area is currently occupied by Buildings 28, 53, 59, 69, and 79 towards the northeast side of the installation. The parking garage would be up to 5-stories, with a maximum footprint of approximately 28,450 SF. As shown in Figure 2-3, the parking garage would not be located adjacent to the fence line. Construction of a parking garage in this location would require demolition of Buildings 28 (administrative office), 53 (Environmental Health Effects Office), and 59 (USU Environmental Laboratory) and relocation of staff to existing facilities on the installation.

Figure 2-3: Medical Facilities Development Alternative Parking Sites

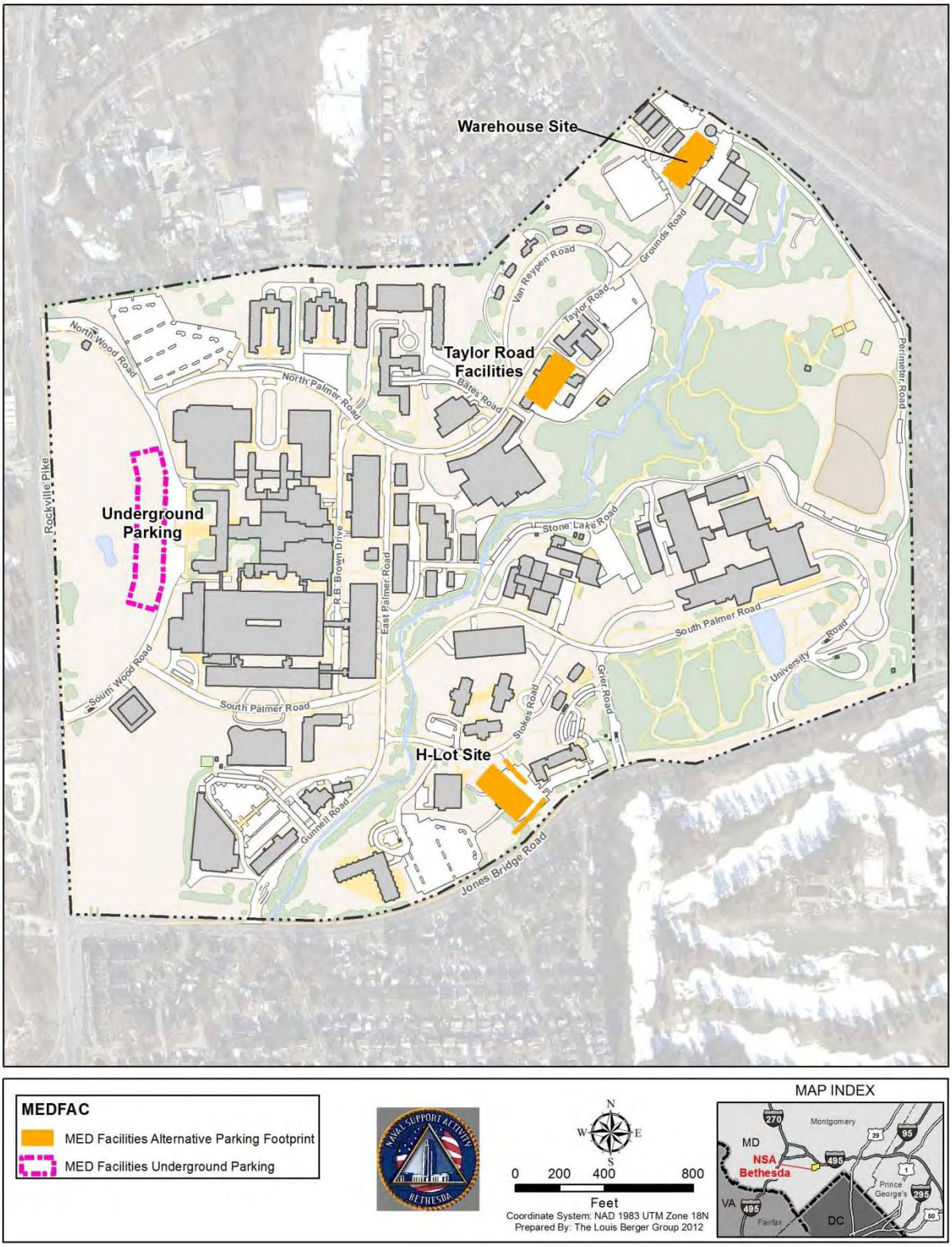


Table 2-3 presents the area requirements for the above-ground parking alternatives.

Table 2-3: Medical Facilities Development - Above-Ground Parking

Alternative Sites	Construction		Demolition	
	Floors	Footprint (SF)	Total Area (SF)	Footprint (SF)
Warehouse Facilities	Up to 6-stories	29,200		
Building 80, 149, 152, 101, and 99 Demolition (single story buildings)			12,089	12,089
H-Lot (includes two surface parking strips)	Up to 6-stories	39,100		
H-Lot Pavement Demolition			35,196	35,196
Taylor Road Facilities	Up to 5-stories	28,450		
Buildings 28, 53, and 59 Demolition			46,041	23,020
Sources: NAVFAC, 2011d, j, and k; LBG, 2011a.				

2.2.2 University Expansion Alternatives

The 2008 NNMC Master Plan identified an area south of the University campus for facility expansion. Since the 2008 Master Plan, a second location west of the University campus was identified as a potential site for the expansion. These sites were selected based on the following criteria:

1. Address Liaison Committee on Medical Education (LCME) accreditation requirements;

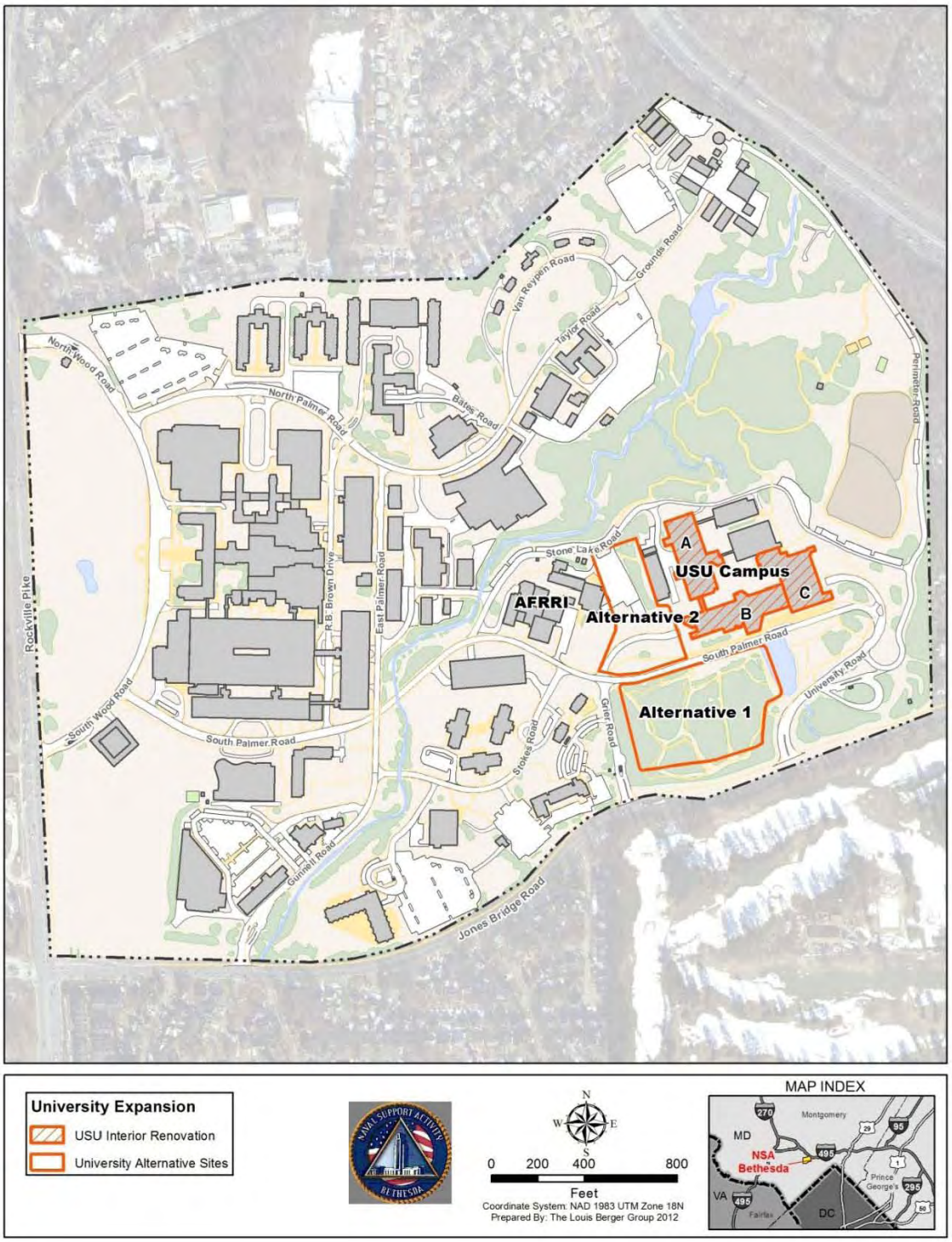
2. Unify 19 departments, activities, and centers currently dispersed in NSA Bethesda buildings or in leased space in and around Rockville, MD;

3. Resolve space constraints following BRAC integration; and

4. Position the USU for sustained relevancy as a competitive and lead academic institution for medical education and biomedical science research, and so enable the WRNMMC endeavors to achieve status as a World Class Academic Health Center.

Both alternative sites meet each of the selection criteria and Alternative Site 2 has been selected as the preferred alternative. These alternative sites, Alternatives 1 and 2, are presented in Figure 2-4.

Figure 2-4: Proposed University Expansion Alternatives Sites and Interior Renovations



Note: The University alternative site areas identified in Figure 2-4 are planning-level footprints and do not reflect the total area of disturbance for the projects, which likely would be smaller following detailed facility design.

Under either of the alternative sites, the University expansion would comprise an approximately 341,151 SF education and research building and 144,000 SF above-ground parking structure for 400 spaces.

2.2.2.1 Alternative 1: South of University Campus

Alternative 1 was identified in the 2008 NNMC Master Plan and would be located in the forested lot east of Grier Road south of the University campus (Figure 2-4). Under Alternative 1, Building F and the above-ground parking garage would be two separate buildings.

2.2.2.2 Alternative 2: West of University Campus

Alternative 2 would be located west of the current University campus in the developed area consisting of a surface parking lot and tree-lined buffer between the buildings of USU and Armed Forces Radiobiology Research Institute (AFRRI) (Figure 2-4). Under Alternative 2, Building F and the above-ground parking garage would be one structure with the garage located underneath the education and research building. This alternative would offer the potential for fostering a continuous campus feel between the two tenants and a potential for a direct connection to the AFRRI buildings where shared laboratories are located. Alternative 2 is the preferred alternative for the University Expansion.

2.2.3 No Action Alternative

The No Action Alternative is required by NEPA and describes the conditions at NSA Bethesda should the proposed actions not occur. The No Action Alternative also performs the important function of acting as an environmental baseline against which the environmental consequences of the action alternatives are measured.

2.2.3.1 Medical Facilities Development

The No Action Alternative would not allow the demolition of Buildings 2, 4, 6, 7, and 8 or the construction of Building C. Interior renovations in Buildings 1, 3, 5, 9, and 10 would not occur. Therefore, the No Action Alternative would not provide WRNMMC with modern, improved right-sized facilities to accommodate the DoD healthcare mission, including the attributes of the new statutory, world-class standards for military medicine as mandated by 2010 NDAA.

Under the No Action Alternative, the associated infrastructure upgrades: demolishing three and constructing four cooling towers; replacing deteriorating condensate return lines across the installation; repairing damaged water lines, backup water supply storage tanks, and distribution lines within the installation; and upgrading electrical capacity would not occur. Construction of the parking structure also would not occur. Therefore, installation utilities capacity would not increase and would be unable to meet demands of future development and parking needs would not be addressed. Under this alternative, the accessibility and appearance projects would also not be constructed; therefore, portions of the

installation would continue to be inaccessible to wounded warriors and other disabled patients.

In addition, under the No Action Alternative, Building 13 would not undergo interior/exterior renovation and a consolidated location for NSA Bethesda security services would not be provided.

2.2.3.2 ***University Expansion***

The No Action Alternative would not allow for the construction of Building F or the parking facility. The University would continue to operate sub-optimally in 19 dispersed departments, centers, and activities dispersed in inadequate and temporary spaces at NSA Bethesda or in off-campus leased locations in Montgomery County, Maryland. Under the No Action Alternative, LCME accreditation of the University would be in jeopardy and the institution would not be able to provide adequate education and research space to meet its Military Health System commitments.

2.2.4 Alternatives Considered and Dismissed from Further Analysis in the EIS

2.2.4.1 Medical Facilities Development

As discussed in Section 2.2.1, four alternatives, including a parking facility, were initially identified in the Medical Facilities Development planning process. Based on the evaluation criteria discussed in Section 2.2.1, Alternative 4 was determined as the best approach to meet the Congressional mandate for world-class facilities commensurate in quality, capability, and condition with the BRAC investment. As discussed in detail in Section 5.3, Evaluation of Each Alternative, of the 2011 WRNMMC Medical Facilities Master Plan, the remaining alternatives (Alternatives 1, 2, and 3) were dismissed from further consideration. The dismissal was based on the evaluation results that identified operational and energy inefficiencies, anticipated future costs to replace renovated structures within the next 20 years, and potentially high relative lifecycle costs. Specific to the patient care and teaching hospital criteria, the evaluation identified the following issues with the remaining alternatives (NAVFAC, 2011a):

- Alternative 1 - Renovate Existing Buildings (2, 4, 6, 7, and 8) and no new construction: existing core buildings cannot be successfully renovated to provide world-class military medicine healthcare standards and would not provide sufficient space to accommodate the medical mission dislocated by clinical decompression (i.e. converting double occupancy to single occupancy rooms).

- Alternative 2 - Renovate Existing Buildings (2, 4, 6, 7, and 8) and Build Balance of Requirement Off-Base: existing core buildings cannot be successfully renovated to provide world-class

military medicine healthcare standards and suitable off-base sites could not be identified. The services would be in different locations and would not allow for efficient and effective delivery of healthcare, resulting in dispersed service. This could increase traffic off-base as patients travel to the various off-site facilities.

- Alternative 3 - Renovate Existing Buildings (2, 4, 6, 7, and 8) and Build Balance of Requirement On-Base: existing core buildings cannot be successfully renovated to provide world-class military medicine healthcare standards and other suitable on-base sites could not be identified. Additionally, this alternative would result in a split campus solution, resulting in a less efficient and effective delivery of medical care and would increase internal on-base traffic.

Therefore, as Alternatives 1, 2, and 3 were dismissed from further consideration based on the evaluation, these alternatives were not analyzed in the EIS.

2.2.4.2 University Expansion

The two alternatives analyzed in the EIS were the only alternatives considered for the University Expansion. Both alternative sites meet each of the selection criteria and were carried forward for the full analysis in this document. Therefore, no alternatives were considered but dismissed for the University Expansion.

2.3 Staff, Patients, and Visitors

2.3.1.1 Medical Facilities Development

The Medical Facilities Development is anticipated to result in an increase of approximately 50 support staff at WRNMMC, with no increase in patients or visitors because the proposed action only right-sizes existing facilities to world-class standards and would not change the mission or function of WRNMMC.

The total number of construction workers on any given day for the Medical Facilities Development plus University Expansion would vary, but is estimated to average 600 per day with a peak of up to 1,000 per day during the construction phases. This is based on the total area that would be constructed, demolished, and renovated. It should be noted that this is a conservative estimate because it includes both the Medical Facilities Development and University Expansion, and the various components of these proposed actions would likely be constructed in different phases.

2.3.1.2 *University Expansion*

Under either of the two alternative sites for the University Expansion, approximately 220 incoming staff from off-base facilities would be consolidated at NSA Bethesda. These personnel are already

part of the institution in the area and currently travel back and forth to the installation. No increase in student population is anticipated because the University Expansion would consolidate already existing activities that are dispersed in various locations on- and off-base.

As noted previously, the total number of construction workers on any given day would vary but is estimated to average 600 per day with a peak of up to 1,000 per day during the construction phases. This is based on the total area that would be constructed, demolished and renovated. It should be noted that this is a conservative estimate because it includes both the Medical Facilities Development and University Expansion and the various components of these proposed actions would likely be constructed in different phases.

2.3.1.3 Schedule

The schedule for implementing the proposed actions must balance facility construction timeframes and patient care continuity. Implementation of all components of the proposed actions is also dependent on the timing of the EIS ROD. Table 2-4 lists the tentative execution schedule for the Medical Facilities Development and the University Expansion.

Table 2-4: Tentative Execution Schedule for the Medical Facilities Development and University Expansion

Project Component	Estimated Construction Award Date	Estimated Construction End Date
Accessibility and Appearance Projects	Feb-13	Aug-14
Temporary Medical Facilities	Aug-13	Oct-14
Electrical Improvements	May-13	Jan-15
Medical Facilities Parking Garages	Dec-13	Dec-15
Building C*	Oct-14	Oct-18
Mechanical (back-up water)	Dec-13	Aug-15
University Expansion (Building F and Parking Garage)	2017	2018

*Building 13 renovations are anticipated to occur within the same timeframe; however, the project would be of shorter duration because it only involves renovations.
Source: Pers. Comm., Sadlon, 2011a.

2.4 Construction Material Storage

Three areas at NSA Bethesda have been identified as potential locations for construction storage and staging as shown in Figure 2-5: 1) the ball field areas in the east; 2) N-lot during 2013-2015; and 3) the area between the helipad and the Navy Exchange towards the southwest. Erosion and sediment control measures would be required and the areas would be restored to original conditions after construction

is completed. The construction contractors would also take measures to control/minimize the visual intrusion of the construction staging area in the surroundings. The University Gate (Gate #5) with the commercial vehicle inspection facility (CVIF) would provide primary access and egress to the construction storage and staging sites.

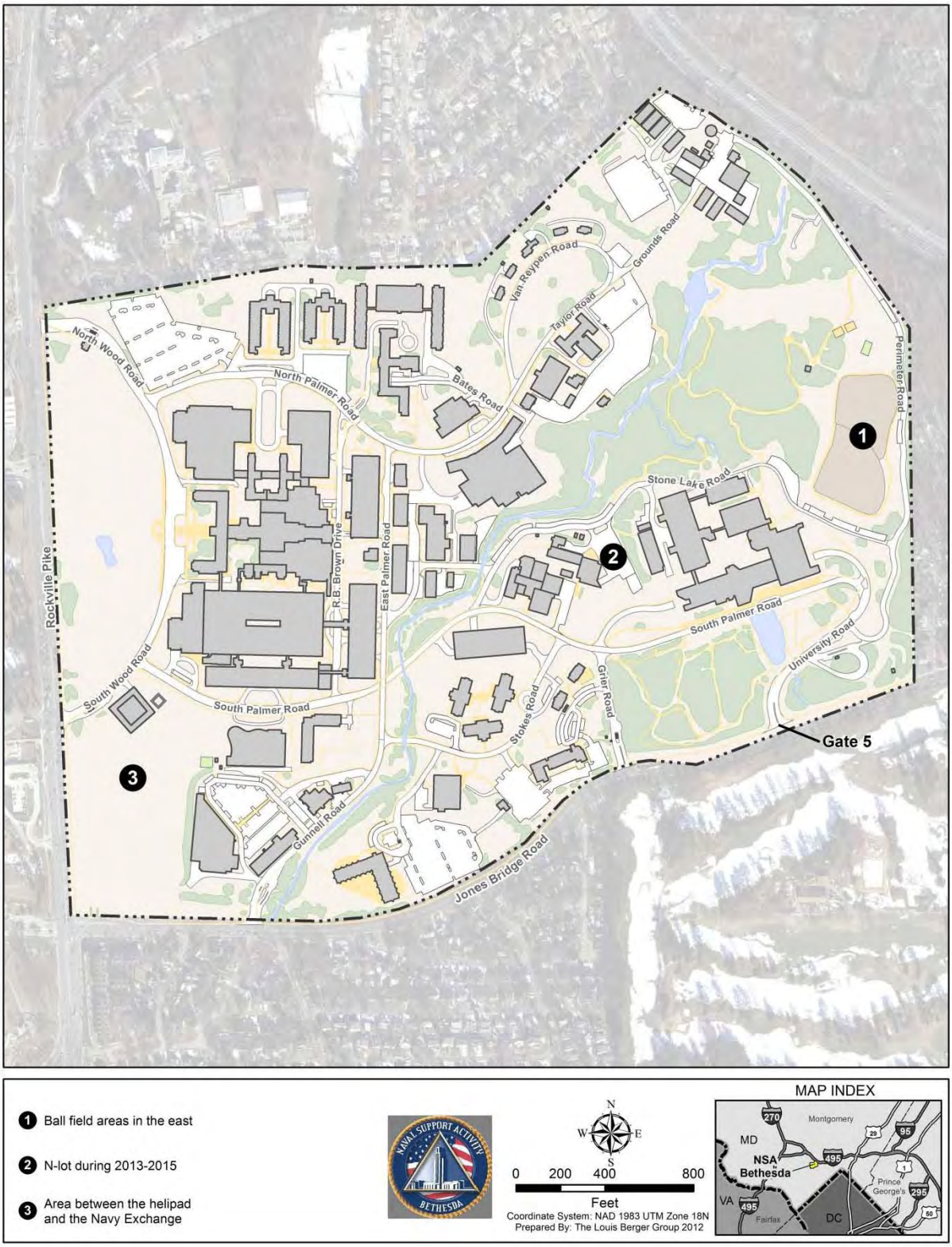
2.5 Cumulative Impacts

A cumulative impact is defined in the CEQ NEPA regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions" (see 40 CFR 1508.7). This section goes on to note that "such impacts can result from individually minor but collectively significant actions taking place over a period of time." Implementation of the No Action Alternative would not involve any proposed actions onsite and therefore, would not result in any additional cumulative impacts. The Medical Facilities Development and University Expansion would involve actions and therefore, would have the potential for adding to cumulative impacts through their impacts on the environmental resources examined in this EIS.

As discussed, the proposed actions are two components of the 2012 NSA Bethesda Master Plan that DoN is currently updating and this EIS analyzes the implementation of these components. The 2011 WRNMMC Master Plan is integrated with the 2012 NSA Bethesda Master Plan. As shown in Figure 2-6, the 2012 NSA Bethesda Master Plan distinguishes the short-term planned projects and long-term opportunity areas at the installation.

In addition, the EIS analyzes the cumulative impacts from the proposed actions when added to impacts from other Federal, state, and local initiatives as appropriate. Chapter 5, Cumulative Impacts, discusses both on- and off-installation impacts and impacts from construction and operations.

Figure 2-5: Potential Construction Staging Sites



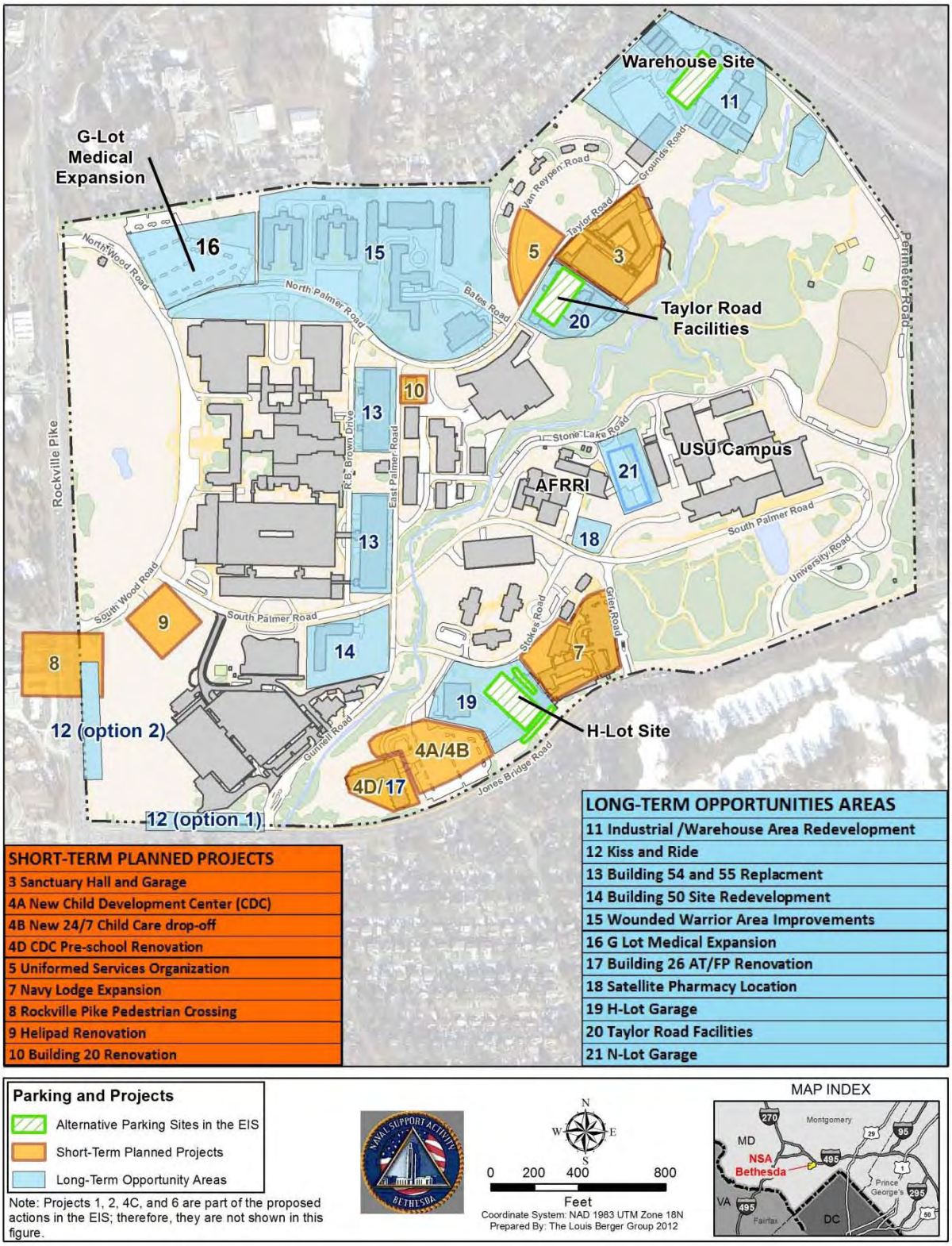
2.5.1 Short-Term Planned Projects

The 2012 NSA Bethesda Master Plan defines short-term planned projects as the projects of known scope that address specific plans, goals, or challenges in the near term. As discussed, the proposed Medical Facilities Development and the University Expansion are part of the short-term planned projects. Therefore, the EIS evaluates the cumulative impacts of the proposed actions in the context of the known, ongoing activities (or short-term planned projects) and identify the potential programmatic impacts of the proposed actions in the context of potential future development opportunities (Figure 2-6) (NAVFAC, 2011d). In addition to the proposed actions, the short-term planned projects include the following projects (Numbers indicate the project location on Figure 2-6 and the projects start at Number 3 because in the 2012 NSA Bethesda Master Plan, the proposed actions Medical Facilities Development and University Expansion are projects numbers 1 and 2, respectively):

- **3 - Sanctuary Hall and Garage**: This project is the construction of a new Wounded Warrior Transition Lodge (WWTL or Sanctuary Hall), which would become Building 64. The building is planned to accommodate 100 two-bedroom hotel-style suites to house wounded warriors and their caregiving family members. Sanctuary Hall is proposed as a 139,285 SF facility to be built to LEED® Silver standards. A 5-story, 470-space, parking garage would be provided as part of this project.

- **4 - Child Development Center**
    - 4A - New Child Development Center (CDC): A new 34,291 SF CDC for 300 children would be built near the existing daycare center (Building 26).
    - 4B - New 24/7 Child Care Drop-Off: A new 20-child 24/7 care residence would be built near the CDC. This 5,262 SF residential home structure would accept children at any time of day or night.
    - 4C – Renovation of Hourly Drop-Off Center: The facility is currently located in Buildings 3 and 5 and the action would be addressed as part of the proposed Building C construction.
    - 4D - CDC Pre-school Renovation: Existing CDC renovation would address space issues in the current daycare center, adding space for a 24-child preschool room.

Figure 2-6: Short-Term Planned Projects and Long-Term Opportunities



- **5 - United Services Organization:** The USO building would be a destination for recreation and support for military personnel at NSA Bethesda. The building is expected to be 3 stories at its tallest section and up to approximately 20,700 SF located in the lawn in front of the Flag Housing area. Figure 2-6 shows the suggested location of the project; however, the final site would be subject to change as the program is further refined.

- **7 - Navy Lodge Expansion:** An expansion of a new 7-story lodging structure, approximately 62,812 SF, is planned for construction adjacent to the existing 6-story Navy Lodge (Building 52). Supporting facilities include new surface parking to serve the lodge addition and improvements to the existing parking to meet current AT/FP standoff distances. The existing U-Lot, currently with 57 spaces, would be reconfigured to provide 95 spaces. The Best Management Plan (BMP - stormwater pond) would need to be improved to accommodate the increase in impervious area.

- **8 - Rockville Pike Crossing:** This project consists of a shallow pedestrian tunnel under Rockville Pike, connecting the east side of Rockville Pike at South Wood Road to the Medical Center Metro station on the west side of Rockville Pike, outside of the NSA Bethesda fence line. Designs also call for deep elevators on the east side of Rockville Pike that connect to the Metro Platform underneath. It should be noted that this project would be constructed by Montgomery County and is included in the 2012 NSA Bethesda Master Plan for coordination purposes only; MCDOT would be the action proponent for this project.

- **9 - Helipad Expansion:** The existing helipad would be reconfigured and expanded. The renovation would add 22,500 SF of bituminous pavement and require significant grading in order to level the new primary surface area. A new retaining wall would be required along South Palmer Road and numerous trees would need to be removed to ensure that primary surfaces of the helipad are free of obstructions.

- **10 - Building 20 Renovation:** The existing fire station located in Building 20 is proposed for relocation and expansion, as current facilities do not meet the station's needs and requirements. Renovation of Building 20 is proposed for community uses such as woodworking shops, commissary services, or indoor recreation and social opportunities. The existing fire station would be relocated to the warehouse area in northeastern NSA Bethesda.

2.5.2 Long-Term Opportunity Areas

The 2012 NSA Bethesda Master Plan also identifies the long-term opportunity areas, facilities, or strategies that are not currently planned, but which should be recognized as part of the larger installation improvement context. For potential future development opportunities, DoN would ensure the appropriate NEPA review is completed when the projects are proposed for implementation. As shown in Figure 2-6, these long-term opportunity areas include:

- **11 - Industrial/Warehouse Area Redevelopment and Fire Station:** A new consolidated 40,000 SF warehouse facility would allow existing warehouse space to be consolidated and could accommodate the anticipated need for an additional 2,000 SF of future growth and provide space for storage relocated from Buildings 13 and 143. Approximately 25,000 SF of outdoor storage area could be located north in the former Z-Lot. This outdoor storage would need to be appropriately screened from the neighboring residential area and every attempt would be made to preserve existing vegetation at the edges of this area. Possible uses for this outdoor storage area are emergency services and security equipment storage, emergency vehicle storage, blood bank and other tenant special vehicle storage, and other typical maintenance uses. This area would replace several smaller storage and laydown areas across the installation. Consolidating warehouse space would allow the area between Grounds Road and Stoney Creek to be redeveloped as a hub for administrative functions, labs, and office space for tenants that do not need to be near the medical center to provide patient care and educational services.

  The new Fire Station building is projected to be approximately 27,600 SF and house a 2-story, three company firehouse.

  A new parking garage may be built on the north side of Grounds Road and would provide parking for the administrative hub and general parking for the installation. The same parking garage location is also analyzed in the EIS as an alternative site to the underground parking garage in the Front Lawn. The Master Plan considers this area in case it is not selected for parking for the Medical Facilities Development.

- **12 - Kiss and Ride:** A kiss and ride facility would address several community and security issues related to transportation to the installation. It should be noted that this project would be constructed by Montgomery County and is included in the 2012 NSA Bethesda Master Plan for

coordination purposes only; MCDOT would be the action proponent for this project.

- A kiss and ride outside the gates would allow car pool commuters to be dropped off near the Medical Center Metro station without entering the secured perimeter of the installation.
- This would allow northbound commuters on Rockville Pike to use a kiss and ride without having to make a left turn into the Metro station kiss and ride.
- This would also address a community desire for a kiss and ride facility.
- As indicated in Figure 2-6, there are two potential locations for this facility. The kiss and ride is included in the Master Plan for coordination purposes only. The Navy would not be responsible for the kiss and ride project.

- **13 - Building 54 & 55:** These garages are nearing the end of their useful life and require substantial annual investment and emergency repair. As part of this long-range plan, these buildings would be demolished and replaced. Replacement buildings would preserve the sky-bridge connections to Buildings 9 and 10 and implement additional connections to America Garage (Building 63) and the future Medical Center Building C.

- **14 - Building 50 Site:** Building 50 (Mercy Hall) is a residential building used for housing wounded warriors receiving care at the Medical Center. Although it was recently renovated, the building will be 50 years old in 2018 and is a candidate for redevelopment to improve both the use of and circulation through this difficult site. Redevelopment of this site presents an opportunity to upgrade an aging building while improving the circulation along this primary pedestrian route.

- **15- Wounded Warrior Area Improvements:** Several enhancements are proposed for the areas surrounding Building 60, 61, 62, and 11. These improvements are part of the Wounded Warrior Area Plan. The goal of this project is to improve the quality of the outdoor environment for wounded warriors and their families by improving pedestrian safety and circulation, incorporating new outdoor amenities, and enhancing natural features.

- **16 - G-Lot Medical Expansion:** The Master Plan states that G-Lot presents a good opportunity for future medical

facility expansion development because of its proximity to the medical center.

- **17 - Building 26 AT/FP Renovation:** Current AT/FP guidelines require occupied buildings using conventional construction to maintain a 148-foot standoff from the installation's controlled perimeter. The current CDC, Building 26, does not meet this requirement. The proposed development that would increase the capacity of NSA Bethesda's CDC system does not address this issue.

- **18 - Satellite Pharmacy Relocation:** The Satellite Pharmacy, currently located east of the Bowling Center off Stokes Road, is a small facility that has potential to be relocated in the long term to free up valuable space for larger-scale development. The current Satellite Pharmacy building also does not meet the architectural standards of the IAP. A potential location for the pharmacy is along South Palmer Road adjacent to AFRRI.

- **Structured Parking Opportunities:** Opportunities for structured parking at NSA Bethesda would provide parking necessary to support future development. As surface lots are developed through a combination of buildings and open space, the displaced parking and the new requirements of development could be accommodated in structured parking. The Master Plan identifies the following structured parking opportunities that could help meet the potential future development demands:

    - **19 - H-Lot Site:** A new above-ground parking garage with approximately 495 spaces in H-Lot would provide accessible parking centralized within the southern half of the installation. This garage may be up to 6 stories, which is consistent with the height of the adjacent Navy Lodge. The same parking garage location is also analyzed in the EIS as a site for an above-ground parking structure as an alternative to the underground parking garage in the Front Lawn.

    - **20 - Taylor Road Facilities:** This site, currently occupied by Buildings 53, 28, 79, 59 and 69, is adjacent to the proposed WWTL and its associated parking garage. This area is planned for an additional 3-story structure and potential utilities expansion. The structure could serve as a 300-space multi-use above-ground garage as an expansion of the existing WWTL garage, or as a stand-alone structure. Final type and use of structure is subject to change as the program is developed. This project requires the demolition of Buildings 53, 28, 79, 59 and 69. The

same parking garage location is also analyzed in the EIS as a site for an above-ground parking structure as an alternative to the underground parking garage in the Front Lawn.

- **21 - N-Lot Site:** This area is identified for an additional 2-story above-ground parking structure and potential utilities expansion. This location is also analyzed in the EIS as an alternative site (Alternative 2) for the University Expansion.

2.5.3 Projects External to NSA Bethesda

The EIS Traffic Study includes the approved background development off installation. These projects are discussed in Section 4.7, Transportation and Traffic Consequences, as well as under Future Background Conditions (Year 2018) in Appendix D – Traffic Study. These projects are also discussed in Section 5, Cumulative Impacts.

2.6 Environmental Consequences

Section 4.0, Environmental Consequences, presents the impacts that would result from the Medical Facilities Development and the University Expansion. The section also discusses appropriate measures to avoid, minimize, or mitigate impacts that would result from the implementation of the proposed actions. Section 4.0 also includes discussion of the No Action Alternative, which would not implement the Medical Facilities Development or the University Expansion. Section 5.0 presents cumulative impacts and analyses of the short-term planned projects and long-term opportunity areas identified in the 2012 NSA Bethesda Master Plan, which includes the Medical Facilities Development and the University Expansion.

Tables 2-5 and 2-6 provide comparison of the environmental consequences for Medical Facilities Development and University Expansion, respectively.

Table 2-5: Environmental Consequences of Medical Facilities Development

Resource Area	Medical Facilities Development					No Action Alternative
Geology and Topography	Building C would be on developed area. Excavation of approximately 18,810 cubic yards would be needed to prepare the building foundation. No impacts from internal renovations. Minimal impacts from temporary medical facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched for utility lines for temporary medical facilities. Water tanks for the backup water system would cause minimal impacts on geology and topography. Excavation of approximately 1,020 cubic yards would be required. Approximately 50,792 SF or 1.17 acres would be trenched for other utility upgrades. Approximately 300 cubic yards of excavation would be required for the cooling towers. Stoney Creek Trail System would require intensive, localized grading. Approximately 450 cubic yards would be excavated for all the accessibility and appearance improvement projects. External renovations to Building 13 would involve minimal ground disturbance within the area of the existing structure. Excavation of approximately 110 cubic yards would be required. No impacts on geology or topography. No impacts from temporary construction material storage; these areas are already flat and disturbed.	**Underground Garage**	**Warehouse Area Garage**	**H-Lot Garage**	**Taylor Road Facilities Garage**	No impacts.
		Would require rock excavation (approximately 27,400 cubic yards of rippable rock); would interact with groundwater and would require dewatering system. The Front Lawn would be restored after construction; impacts would be minimal.	Located in developed area; minimal impacts. 670 cubic yards of excavation would be needed.	Located in developed area; minimal impacts. 630 cubic yards of excavation would be needed.	Located in developed area; minimal impacts. Excavation comparable to warehouse area garage and H-Lot garage.	
Soils	Building C would be on developed area. Excavation of approximately 18,810 cubic yards would be needed to prepare the building foundation. Temporary and minimal impacts from	**Underground Garage**	**Warehouse Area Garage**	**H-Lot Garage**	**Taylor Road Facilities Garage**	No impacts.
		2.6 acres would be disturbed	Mostly developed area; 0.68 acre	Mostly developed area; 0.9 acre	Mostly developed area; 0.65 acre	

Resource Area	Medical Facilities Development					No Action Alternative
	digging a trench for utility lines for the temporary medical facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched. No impacts anticipated for the internal renovations. Construction from utilities upgrades would have temporary and minimal impact on soils. Approximately 9,255 linear feet, or an area of 37,020 SF (0.85 acre) of soil would be trenched to upgrade or replace the existing condensate utility lines. Approximately 2,463 linear feet, or an area of 9,848 SF (0.23 acre) of soil would be trenched for the water line connection between the proposed backup water tanks and Building 16. An additional 980 linear feet, or 3,920 SF (0.09 acre) would be trenched for electrical upgrades. Approximately 4,450 SF (0.1 acre) of impervious area would result from the demolition and replacement of the cooling towers. Excavation would be required for the water tanks (approximately 1,020 cubic yards). Stoney Creek Trail System would require intensive, localized grading and construction of a new foot-bridge and replacement of an existing bridge, which would disturb soils under the foundations. The total estimated amount of excavation needed for all of the accessibility and appearance improvements projects is approximately 450 cubic yards. Minimal impacts from external renovations to Building 13. Excavation of approximately 110 cubic yards would be required. Minimal and temporary impacts from temporary construction material	during construction; the Front Lawn would be restored after construction; impacts would be minimal. Excavation would be required; see Geology and Topography. General construction permit would minimize impacts.	new impervious surface. General construction permit would minimize impacts. Excavation would be required; see Geology and Topography.	new impervious surface. General construction permit would minimize impacts. Excavation would be required; see Geology and Topography.	new impervious surface. General construction permit would minimize impacts. Excavation would be required; see Geology and Topography.	

Resource Area	Medical Facilities Development					No Action Alternative
	storage; these areas are already disturbed. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures. If any contaminated soils are discovered, they would be remediated in accordance with Federal and state regulations.					
Water Resources	Surface Water Building C would result in 0.2 acre gain in pervious surface because of Buildings 2, 4, 6, 7, and 8 demolitions. New impervious surfaces: 0.14 acre - accessibility and appearance improvements projects, 0.6 acre – water tanks for the backup water system. Pervious pavement would be utilized for the Stoney Creek Trail System improvements, which would minimize impacts. None or minimal impacts on surface water from internal renovations, temporary medical facilities, and Building 13 renovations. Temporary impacts from construction material storage from potential runoff; minimal impacts due to use of BMPs. New impervious surface would increase stormwater runoff and pollutants. An approved Stormwater Management Plan and BMPs would be required to control runoff. Groundwater See parking options. Minimal or no impacts on groundwater from other	**Underground Garage** Surface Water 2.6 acres would be disturbed during construction. Groundwater Would interact with groundwater and dewatering system required. General construction permit would minimize impacts and potential for impacts from oil, grease and antifreeze would be minimized with BMPs and Standard Operating Procedures.	**Warehouse Area Garage** Surface Water Would result in total 0.68 acre of impervious surface (0.1 acre new); mitigation measures similar to underground garage. Operational impacts could result from runoff from petroleum, oils, lubricants, and from vehicles. BMPs and stormwater management controls would minimize impacts. No impacts on floodplains or wetlands. Minimal impacts on groundwater.	**H-Lot Garage** Surface Water Would result in total 0.9 acre of impervious surface (between 0.334 and 0.1 acre of new depending on design); mitigation measures similar to underground garage. Operational impacts would be similar to warehouse area garage. No impacts on floodplains or wetlands. Minimal impacts on groundwater.	**Taylor Road Facilities Garage** Surface Water Would result in total 0.65 acre of impervious surface (0.06 acre new); mitigation measures similar to underground garage. Operational impacts would be similar to warehouse area garage. No impacts on floodplains or wetlands. Minimal impacts on groundwater.	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	project components. Floodplains A portion of Stoney Creek Trail System would be constructed within the 100-year floodplain (but this is not a Federal Emergency Management Agency regulated floodplain); a Maryland Department of the Environment (MDE) permit would be required, and adherence to permit stipulations would minimize impacts. No impacts on floodplains from other project components. Wetlands A small portion of Stoney Creek Trail System would be near potential wetlands; final design layout would avoid the areas to the extent possible and if unavoidable would comply with DoD's no net loss policy. Navy would coordinate with the U.S. Army Corps of Engineers as needed. No impacts on wetlands from other project components.					
Biological Resources	USFWS has determined that, except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project areas for the proposed actions. MDNR has determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites. Should transients be encountered during the construction/demolition process, the Navy would take appropriate actions and comply with requirements under the ESA. Building C would impact 0.1 acre of landscaped vegetation in developed area and would not be significant. Minor impacts on wildlife and wildlife	**Underground Garage** 2.6 acres of the Front Lawn would be disturbed during construction; would be restored to landscaped area after completion. Wildlife, particularly urbanized species that would likely be present, may be temporarily impacted during	**Warehouse Area Garage** 0.05 acre of landscaped lawn and 0.04 acre of forest would be permanently converted to impervious surface; would likely involve the use of vegetative barriers and landscaping.	**H-Lot Garage** 0.3 acre of landscaped lawn and 0.05 acre of forest would be permanently converted to impervious surface; protection measures similar to warehouse garage.	**Taylor Road Facilities Garage** 0.04 acre of landscaped lawn and 0.01 acre of forest would be permanently converted to impervious surface; protection measures similar to warehouse garage.	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	habitat; mainly to urbanized species. Some juvenile or non-mobile species could be permanently lost. None or minimal impacts from internal renovations, construction of temporary medical facilities, and Building 13 renovations. Utilities upgrades would have temporary impacts on landscaped vegetation; wildlife may be temporarily displaced. Some juvenile or non-mobile species could be permanently lost. The accessibility and appearance improvements projects would increase the amount of landscaping on NSA Bethesda. There would be minor vegetation impacts and minor impacts on wildlife and aquatic habitats and species. Temporary construction material storage areas are already disturbed. Only one area contains some grassy vegetation that would be temporarily affected; species inhabiting the area would relocate. Some juvenile or non-mobile species could be permanently lost. Minor operational impacts could occur to wildlife from the Medical Facilities Development. There could be some disturbance to wildlife including migratory birds in some areas, but noise levels would not be expected to increase to a level that would result in permanent disturbance of these species. Impacts on migratory birds overall would be minor.	construction.				

Resource Area	Medical Facilities Development					No Action Alternative
Air Quality	Emissions from the construction and operation of the proposed actions, including any of the parking alternatives do not exceed *de minimis* levels for moderate nonattainment for ozone, nonattainment for $PM_{2.5}$ and CO maintenance and therefore, would not have significant adverse impacts on air quality. The Record of Non-Applicability is included in Appendix B of this EIS. Minor modifications to Title V permit expected due to Building C and parking garage requirements for new emergency generators. No significant impacts from GHGs expected.					No impacts.
Noise	Noise impacts related to traffic would occur in areas already experiencing vehicular noise; therefore, no additional impacts are expected. During construction of Building C, sensitive receptors adjacent to and outside the southern wall of Building 19, and the northern walls of Buildings 9 and 9A would experience noise impacts. Some combination of noise attenuating measures could be needed during construction including scheduling construction activities during business hours. Internal renovations would occur inside existing buildings and would not use heavy construction equipment. No impacts on sensitive receptors. For utilities upgrades, some combination of noise-attenuating measures could be required if construction occurs outside of business hours. It is anticipated that construction would occur during daylight hours, but the contractor could request to work outside of those hours, in compliance with the Montgomery County Noise Control Ordinance. Minor, short-term impacts could occur from accessibility and appearance improvement projects to populations located in the northern extent of Building 19 and Building 63, portions	**Underground Garage** Noise impacts on nearby sensitive receptors not anticipated during construction.	**Warehouse Area Garage** Noise impacts on nearby sensitive receptors not anticipated during construction.	**H-Lot Garage** During construction of the H-Lot Parking Garage, Navy Lodge patrons would experience noise impacts. Some combination of noise attenuating measures could be needed during construction including scheduling construction activities during business hours.	**Taylor Road Facilities Garage** Noise impacts on nearby sensitive receptors not anticipated during construction.	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	of the northern extent of Building 9, the southern extent of Building 61, and the western extent of Building 17. If construction would occur less than 50 feet from these buildings and noise levels exceed adopted levels, noise mitigation measures would be required. No significant impacts on sensitive receptors. No impacts from Building 13 renovations. Temporary and intermittent noise from vehicles delivering and picking up construction materials from temporary storage areas are not expected to create significant noise impacts.					
Utility/ Infra-structure	Building C would require a net increase of 10,803 pounds per hour of steam, 1,445 gpm of chilled water, and 1,095 tons of cooling capacity over the existing buildings that would be demolished. Relocation required for utilities lines in crawl space of Buildings 2, 7, and 8. The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers and would ensure no impact on regional service provision. Although Building C is larger than the combined area of the buildings it replaces, it is not expected to have an increased demand for potable water or sewer due largely to the water conservation measures that would be incorporated into the new LEED® Silver designed building. The installation would require 6.5 MVA of additional power for the construction of new facilities, as well as for the proposed upgrades and	**Underground Garage** Power demands for the parking garage alternative (underground or above-ground) would be relatively minor and accommodated within the proposed electrical upgrade. There would be no sewer or natural gas service to the parking garage. Water line would be needed for fire suppression system, and stormwater management systems would be required.	**Warehouse Area Garage** Similar to underground garage. Water line relocation may be required to allow the construction. The specific relocation route is not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers.	**H-Lot Garage** Similar to underground garage. Water and natural gas lines relocation may be required to allow the construction. The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service	**Taylor Road Facilities Garage** Similar to underground garage.	The existing condensate return lines would continue to fail and decrease the overall reliability of the system. The existing electrical and steam, and chilled water systems would not be able to support additional development or redevelopment at the installation.

Resource Area	Medical Facilities Development					No Action Alternative
	renovations. This additional power would be provided through the proposed upgrade in the power capacity. No or minimal impacts from internal renovations. The temporary medical facilities are a replacement of the existing functions within the buildings (2, 4, 6, 7, and 8) to be demolished. Because the temporary medical facilities would not house additional functions beyond what was displaced from these locations, there would be no net change to the utilities associated with the operation of this project. Construction of cooling tower upgrades, and replacement of condensate return lines would all have a positive impact on the steam and chilled water system by increasing the capacity of these systems. Replacement of existing failing condensate lines would eliminate substantial leaks and increase the efficiency of the central steam heating system. Building 13 renovations would result in minor increases in usage for utilities including water, sewer, heating/cooling, telecommunications, and electricity due to the increased occupancy that would result from the renovations. Specific load requirements are not known as design has not progressed; however, it would be accommodated within the upgrades occurring under the proposed actions. The Navy is coordinating with the utilities service providers (Washington Suburban Sanitary Commission [WSSC], Washington Gas, and PEPCO) to ensure that these proposed changes do not affect service delivery to the larger			providers.		

Resource Area	Medical Facilities Development					No Action Alternative
	community by verifying that system can accommodate the additional load.					
Transporta-tion	The proposed action would generate truck trips for transporting of construction materials to the installation and construction and demolition debris for off-site disposal. Operation of any of the components of the Medical Facilities Development would generate between 14 and 17 staff trips during the AM peak hour and between 14 and 16 staff trips during the PM peak hour and would also either shift between 149 and 294 staff trips during the AM peak hour and between 177 and 306 staff trips during the PM peak hour or shift 176 patient trips during the AM peak hour and 83 patient trips during the PM peak hour within the installation roadway network. New staff trips and shifted staff trips would be able to more safely access Building C as a result of the accessibility and appearance improvements. There would be no increase in patient or visitor trips (See Section 2.3). No significant impacts on traffic would occur as a result of any of the components under this proposed action. It is also recommended that the Installation TMP continue to be implemented to reduce the number of vehicle trips on the external and internal roadway system by using the Metro, Montgomery County transit system, vanpools, carpools, and bicycle trails.	**Underground Garage** Patient trips would be shifted to this facility in Traffic Study Alternatives 1, 2, 6, and 7; however, no significant impact on installation roadways would occur.	**Warehouse Area Garage** Staff trips would be shifted to this facility in Traffic Study Alternatives 3 and 8; however, no significant impact on installation roadways would occur.	**H-Lot Garage** Staff trips would be shifted to this facility in Traffic Study Alternatives 4 and 9; however, no significant impact on installation roadways would occur.	**Taylor Road Facilities Garage** Staff trips would be shifted to this facility in Traffic Study Alternatives 5 and 10; however, no significant impact on installation roadways would occur.	Does not add to projected traffic growth.
Cultural Resources	Demolition alone of Buildings 2, 4, 6, 7, and 8 would not have direct impacts on cultural resources because these buildings have all been determined to be ineligible for NRHP. However, the replacement Building C would be	**Underground Garage** No adverse effect is anticipated if ingress/egress on	**Warehouse Area Garage** Determinations of Eligibility for Building 149 and	**H-Lot Garage** No impacts.	**Taylor Road Facilities Garage** DOEs would be required for Buildings 59,	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	attached to the rear or east of the Central Tower Block (Building 1) and be engaged with Buildings 3 and 5. A design parameter has been set that the height of Building C would be generally consistent with the height of the tallest building to be demolished. Future design reviews by MHT and NCPC under their respective legal authorities would be expected to result in the avoidance, minimization, and/or mitigation of any potential adverse effects on the Central Tower Block or Buildings 3 and 5 as historic properties. Internal Renovations: Section 106 would be required only if there are changes to the grand multi-level Art Deco entrance hall of the Central Tower Block; otherwise, the interior renovations would have no adverse effect upon historic properties. Temporary facilities: No adverse impacts. Utilities Upgrades: No adverse impacts. Accessibility and Appearance Improvements: North Palmer Road – Review of the detailed design drawings by MHT and NCPC would be required to ensure avoidance of adverse effects to Building 1, the Lawn, and Building 11, as NRHP resources. Building 17 Connector - Review of design drawings by MHT and NCPC would be required to ensure avoidance of adverse effects to Building 17 and the Flag Quarters. Stoney Creek Trail System - Further archaeological investigations may be required once the bridge footprints and ground disturbance potential of the project have been identified. The appropriate course of action to achieve compliance with the NHPA and other relevant cultural resource laws would	Wood Road at the Building 1 Entrance is sensitively designed in accordance with the Secretary of Interior standards.	152 are underway; preliminary indications are that the two buildings are ineligible; however, the determination process would require concurrence by the MHT before being considered final.		69, and 79 prior to their demolition, and Section 106 consultation with MHT if determined NRHP eligible; no adverse to adjacent historic properties (Flag Quarters and Building 17) are expected because of the limited scale and distance.	

Resource Area	Medical Facilities Development					No Action Alternative
	be determined and implemented by the Navy, following consultation with the MHT. Building 13 Renovation: No adverse effect on cultural resources; Navy would consult with the MHT on the development of a design that would not negatively impact the remaining character defining features such as the fenestration, materials, rhythm of openings, and period details such as the entrance canopy. Construction Material Storage: Some physical impacts on the ground surface, but impacts would be temporary and the areas would be restored to existing conditions. None of the areas fall within any known zone of archaeological sensitivity. The proposed laydown area between the helipad and Navy Exchange is located within an NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.					
Land Use and Aesthetics	All proposed land uses are consistent with current plans and precedence. No direct effects outside the NSA Bethesda boundaries to land use are expected and the proposed actions are consistent with the installation Master Plan. A temporary alteration of the visual character of the G-Lot parking area would occur as a result of the temporary medical facilities; however, these impacts would cease upon completion of construction, and there would be no long-term, permanent impacts on the visual character of these areas. Beneficial impacts on land use and aesthetics are anticipated as a result of the accessibility and appearance improvement projects.	**Underground Garage** Short term visual impacts during construction.	**Warehouse Area Garage** Compatible with their respective functional land use zones and would be visually compatible with surrounding buildings. Short term visual impacts during construction.	**H-Lot Garage** Compatible with their respective functional land use zones and would be visually compatible with surrounding buildings. Short term visual impacts during construction.	**Taylor Road Facilities Garage** Compatible with their respective functional land use zones and would be visually compatible with surrounding buildings. Short term visual impacts during construction.	Accessibility and appearance needs would not be addressed.

Resource Area	Medical Facilities Development					No Action Alternative
	There would be a temporary impact on the visual character from the temporary construction material storage areas; however, these impacts would cease upon completion of construction, and there would be no long-term, permanent impacts on the visual character of these areas. No impacts from internal renovations, Building C, utilities upgrades, and Building 13 renovations.					
Socio-economics	Beneficial economic effects to the local economy would be expected as a result of the proposed action; however, none of the proposed action's alternatives would have a significant impact on the local economy. Construction costs for the Medical Facilities Development depend on the final selection of a parking facility alternative. The proposed action would allow implementation of the FY 2010 NDAA Congressional mandate to achieve the new statutory world-class standards for military medicine at WRNMMC and "right-size" the facilities. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**Underground Garage** Total estimated construction cost for Medical Facilities Development: $629,462,000. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**Warehouse Area Garage** Total estimated construction cost for Medical Facilities Development: $617,648,337. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**H-Lot Garage** Total estimated construction cost for Medical Facilities Development: $617,609,000. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	**Taylor Road Facilities Garage** Total estimated construction cost for Medical Facilities Development: $618,484,650. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	"Right-sized" facilities would not be provided. New statutory, world-class standards for military medicine would not be met. There would be no dis-proportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.
Human Health and Safety	Demolition of buildings and internal renovations has the potential for ACM and lead-based paints and increase in hazardous material and hazardous waste; adherence to SOPs and applicable regulations would avoid impacts. The Navy received No Further Action	**Underground Garage** Fuel tank for a backup generator for the dewatering system would be	**Warehouse Area Garage** Fuel tank for backup generator; adherence to SOPs and applicable regulations would	**H-Lot Garage** Fuel tank for backup generator; adherence to SOPs and	**Taylor Road Facilities Garage** Fuel tank for backup generator; adherence to SOPs and	No impacts.

Resource Area	Medical Facilities Development					No Action Alternative
	determinations for SWMUs 4, 5, and 35. Work plans for remediation have been developed for SWMUs 32 and 33. Development in or around SWMUs or Areas of Concern (AOC) under the RCRA Corrective Action Permit would occur only with concurrence from USEPA.	required; adherence to SOPs and applicable regulations would avoid impacts.	avoid impacts. Building 99 would require the removal of two USTs, one AST and one OWS. Demolition of Building 149 would occur in area of SWMUs 4, 34, 32, and 33; development would occur only with concurrence from the USEPA. Adherence to SOPs and applicable regulations would avoid impacts. Activities at sites designated as SWMUs/AOCs would occur only with USEPA concurrence.	applicable regulations would avoid impacts.	applicable regulations would avoid impacts. Demolition of Building 53 would require the removal of one UST and one AST; Building 53 includes AOC 2 and occur in the vicinity of SWMU 5. AOC 2 covers multiple sites, including the area at Taylor Road, and overall clean-up actions are ongoing. The Taylor Road area is finished and full close-out of AOC is anticipated prior to ROD signature. Demolition of two buildings that may contain lead-based paints or ACM would occur. Demolition of Building 53. Adherence to SOPs and applicable regulations would avoid impacts. Activities at sites designated as SWMUs/AOCs would occur only with USEPA	

Resource Area	Medical Facilities Development					No Action Alternative
					concurrence	
Cumulative Impacts	Not expected to have incremental impacts significantly greater than those determined in the assessment of the proposed actions.	**Underground Garage**	**Warehouse Area Garage**	**H-Lot Garage**	**Taylor Road Facilities Garage**	No impacts.
		Not expected to have incremental impacts significantly greater than those determined in the assessment of the proposed actions.	Same as underground parking garage alternative.	Same as underground parking garage alternative.	Same as underground parking garage alternative.	

Table 2-6: Environmental Consequences of University Expansion

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
Geology, Topography, and Soils	Site has greater than 15 percent slopes; extensive cut and fill and grading would be required for construction; 2.8 acres of soils would be disturbed for construction. Approximately 1,115 linear feet, or an area of approximately 4,460 SF (0.1 acre) would need to be trenched for associated utilities upgrades. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures.	Site mostly developed and has a parking lot; between 0.6 and 1.6 additional acres of soil would be disturbed for construction. Approximately 500 linear feet, or an area of approximately 2,000 SF (0.05 acre) would need to be trenched for associated utilities upgrades. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures.	No impacts.
Water Resources	Would result in 2.8 acres of new impervious surface in a previously forested area. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures. The increase in impervious surface could increase both the volume of stormwater runoff and the amount of sediments and pollutants transported offsite. However,	Between 0.6 and 1.6 acres new pervious surface in a mostly developed area. General construction permit with Maryland approved erosion and sediment control plan would be obtained prior to construction and would reduce impacts from sedimentation using approved measures. This site is located less than 200 feet south of Stony Creek; therefore, NSA Bethesda would ensure strict adherence to the BMPs and SOPs with planning and stormwater management improvements to minimize direct impacts on	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	the LID required by the new stormwater regulations is intended to minimize impacts occurring as a result of impervious footprints. Stormwater controls would also be implemented for the proposed action. University Pond could also be used as a stormwater control for the new site. However, use of this basin to accommodate runoff from the site would have to be specifically considered during the Maryland Department of the Environment (MDE) permitting process. Increases in parking would increase the amount of oil, grease, and antifreeze that could be carried into the waters through runoff, affecting the water quality of Stoney Creek. However, the potential for runoff of oil, grease, and antifreeze would be minimized by following BMPs and SOPs with planning and stormwater management improvements. The conversion of forested area to impervious surfaces would permanently impact the previously undisturbed infiltration area. However, NSA Bethesda would ensure that precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system. This alternative site is not located within the Stoney Creek floodplain.	surface waters. These impacts are anticipated to be minor. The proposed construction activities, the increase in impervious area, and new parking facilities would all generate small quantities of pollutants such as petroleum, oils, and lubricants that would be treated when proper water quality controls are implemented during construction and once the facilities become operational. This site is not located within the Stoney Creek floodplain or near the potential wetlands at NSA Bethesda.	
Biological Resources	Up to 4.2 acres of forested area and trails could be impacted. The loss of forested area would result in a direct loss of wildlife and wildlife habitat. No impacts on threatened and endangered species (see Biological Resources, Medical Facilities Development).	Up to 1.7 acres of landscaping and 0.3 acre with scattered trees could be impacted. Wildlife impacts in the area would be minimal. No impacts on threatened and endangered species (see Biological Resources, Medical Facilities Development).	No impacts.
Air Quality	Emissions from the construction and operation of the proposed actions, including any of the parking alternatives do not exceed *de minimis* levels for moderate nonattainment for ozone, nonattainment for PM2.5 nonattainment and CO maintenance and would have no	Same as Alternative 1.	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	significant adverse impacts on air quality. The Record of Non-Applicability is included in Appendix B of this EIS. Minor modifications to Title V permit could occur for potential parking garage emergency generator. No significant impacts from GHGs expected.		
Noise	Noise impacts related to traffic would occur in areas already experiencing vehicular noise and would not be expected to cause additional impacts. Noise impacts not anticipated during construction.	Noise impacts related to traffic would occur in areas already experiencing vehicular noise and would not be expected to cause additional impacts. During construction, noise impacts expected at the western wall of the University and at AFRRI. Some combination of noise attenuating measures could be needed during construction including scheduling construction activities during business hours.	No impacts.
Utilities/ Infrastructure	The proposed action would increase USU's demand for power, telecommunications, potable water, sewage treatment, and natural gas. There is sufficient available capacity on the data and telecommunications systems to support expansion of the University without adverse impacts on existing users. There is ample available capacity to support power demands of the University Expansion alternatives via an independent feeder that supplies electricity to the USU and AFRRI complexes. However, the Navy will coordinate with PEPCO to confirm the capacity once the design work is completed and the exact utility requirements are known. The increase in demand for natural gas to heat steam for the University Expansion would be minor compared to the overall gas demand on the installation. The Navy is coordinating with Washington Gas on the capacity and because design work in not yet complete, the initial coordination is based on the square feet estimates for	Same as Alternative 1; steam/chilled water utilities would have to travel a shorter distance from the current USU buildings compared to Alternative 1. An existing WSSC sanitary sewer line may have to be relocated for Alternative 2 site.	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	Building F and the parking garage. The Navy will confirm the capacity once the design work is completed and the exact requirements are known. Based on the building sizes for Building F and the parking garage, the University Expansion is expected to increase the demand for potable water by approximately 20,460 gallons per day (gpd). A WSSC sanitary sewer line currently exists adjacent to each of the alternative University Expansion sites. The expansion is expected to increase the demand for sewer service by approximately 20,460 gpd. The Navy is coordinating with WSSC on the capacity. The Navy will confirm the capacity once the design work is completed and the exact requirements are known. Either location for the University Expansion would require stormwater management systems and mitigation measures to comply with Maryland Stormwater Management Guidelines for state and Federal projects. Steam/chilled water utilities would have to travel a longer distance from the current USU buildings compared to Alternative 2. The Navy is also coordinating with the service providers to ensure that these proposed changes do not affect service delivery to the larger community by verifying that system can accommodate the additional load.		
Transportation	The proposed action would generate truck trips for transporting construction materials to the installation and construction and demolition debris for off-site disposal. Operation of the University Expansion would generate between 135 and 161 new staff trips during the AM peak hour and between 163 and 193 new staff trips during the PM peak hour within the installation roadway network. There would be no	Same as Alternative 1.	No impacts.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
	increase in visitor trips (See Section 2.3). No significant impacts on traffic would occur as a result of any of the components under this proposed action. It is also recommended that the Installation TMP continue to be implemented to reduce the number of vehicle trips on the external and internal roadway system by using the Metro, Montgomery County transit system, vanpools, carpools, and bicycle trails.		
Cultural Resources	No impacts are anticipated. Phase I Archaeological Survey was conducted in 2007, and MHT determined that none of the sites found warranted further work to determine NRHP eligibility.	Would not have any adverse impact on the integrity of AFRRI as a historic property or to any other cultural resource. Phase I Archaeological Survey was conducted in 2007, and MHT determined that none of the sites found warranted further work to determine NRHP eligibility.	No impacts.
Land Use and Aesthetics	Forested areas and trails would be impacted and the visual character of the area would be altered and the proposed new structures would have long-term impacts on the existing visual character of the area. NSA Bethesda would ensure that the removal of the forested area would be minimized to the extent possible during the design of this alternative.	The alternative would offer the potential for fostering a continuous campus feel between the two tenants and a direct connection to the AFRRI buildings, where shared laboratories are located. The alternative would not noticeably change the visual character of the area.	No impacts.
Socioeconomics	Beneficial economic effects to the local economy would be expected. The construction spending for this proposed action is estimated to be $252,800,000. The proposed action would provide adequate education and research space to meet Military Health System commitments and address the most recent LCME accreditation requirements for student-centered learning, small-group teaching, and technological innovation. There would be no disproportionate high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations or children.	Similar to Alternative 1.	The institution would continue to operate sub-optimally with various dispersed departments and activities. Additionally, LCME accreditation of the university would be in jeopardy.

Resource Area	University Expansion Alternative 1	University Expansion Alternative 2	No Action Alternative
Human Health and Safety	By moving facilities that currently reside off campus to facilities on campus it is anticipated that the authorized user list of the hazardous materials and hazardous waste would grow. The amount of regulated medical waste produced would also increase. However, the increase would be managed in compliance with all applicable Federal and state regulations and would adhere to the NSA Bethesda Hazmat Program.	Same as Alternative 1. A special provision for parking below the occupied building would need to be provided in order to meet AT/FP criteria so that there would be no impact on human health and safety.	No impacts.

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3.0 EXISTING ENVIRONMENT

3.1 Geology, Topography, and Soils

This subsection describes the geology, topography, and soils in the areas for the proposed actions. Assessment of the existing soils is based on the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service 2007 Soil Survey for Montgomery County, Maryland (USDA, 2007a).

3.1.1 Geology and Topography

NSA Bethesda is located on the eastern side of the Piedmont physiographic province. The Piedmont lies between the Atlantic Coastal Plain, which begins about 5 miles to the southeast within Washington DC, and the Blue Ridge Province, which begins at Catoctin Mountain about 30 miles to the northwest. The Piedmont Province extends from New York to Georgia and traverses a 30- to 45-mile wide swath through Maryland.

The Piedmont Plateau Province is composed of hard, crystalline igneous and metamorphic rocks. Bedrock in the eastern part of the Piedmont consists of schist, gneiss, gabbro, and other highly metamorphosed sedimentary and igneous rock of probably volcanic origin. Deep drilling has revealed that similar metamorphic and igneous rock underlie the sedimentary rocks of the Coastal Plain.

The Sykesville Formation and igneous rocks that flowed upward through the Sykesville Formation are the two geologic formations that underlie NSA Bethesda. The eastern half of NSA Bethesda is underlain by the rock of the Sykesville Formation. Meta-sedimentary rocks within this formation were originally deposited as sediments, but have been transformed by high heat and pressure into crystalline rocks. The western half of NSA Bethesda is underlain by younger rocks that represent an igneous intrusion in the Sykesville Formation; they flowed as molten material up through the already crystallized Sykesville Formation (NNMC, 2000). No unique geological features occur within NSA Bethesda.

The topography of NSA Bethesda is generally rolling with the steepest slopes occurring along Stoney Creek. The highest elevation on NSA Bethesda, 330 feet above mean sea level (MSL), is found near the southwest corner of the installation where Rockville Pike intersects with Jones Bridge Road, in the vicinity of the Navy Exchange. The lowest elevation, 210 feet above MSL, is along Stoney Creek. The creek is a tributary to Rock Creek located on NSA Bethesda and leaves NSA Bethesda in the northeast portion and passes into a culvert under I-495. Net relief throughout the installation is approximately 120 feet (NNMC, 2000). Slopes are shown in Figure 3-1, with portions of the proposed actions requiring soil disturbance overlaid (Note: the

interior renovation areas are not shown on Figure 3-1, as no ground disturbance would be required for those components).

3.1.1.1 Geology and Topography - Medical Facilities Development

The site for the main component of the Medical Facilities Development, which consists of phased demolition and replacement of existing buildings in the core of the developed portion of the medical center, is relatively flat, having been graded prior to the development of existing buildings. Similarly, the sites for the H-Lot garage, the Taylor Road Facilities parking garage, the warehouse area garage, and the temporary medical facilities in G-Lot are also relatively flat, having been graded in the past to accommodate existing parking areas or other structures. Stoney Creek does flow near the proposed warehouse area garage site; therefore, there are steep slopes down to the creek around the southeastern side of this site. Improvements to water, CATV, steam, condensation, and electrical utilities would occur throughout the campus on slopes of varying degrees. Demolition and construction of cooling towers would occur in areas of relatively flat land that have been previously graded prior to the development of existing buildings. Accessibility and appearance improvement projects would consist of improvements to existing infrastructure and for the majority of the projects would be completed in areas that have already been graded.

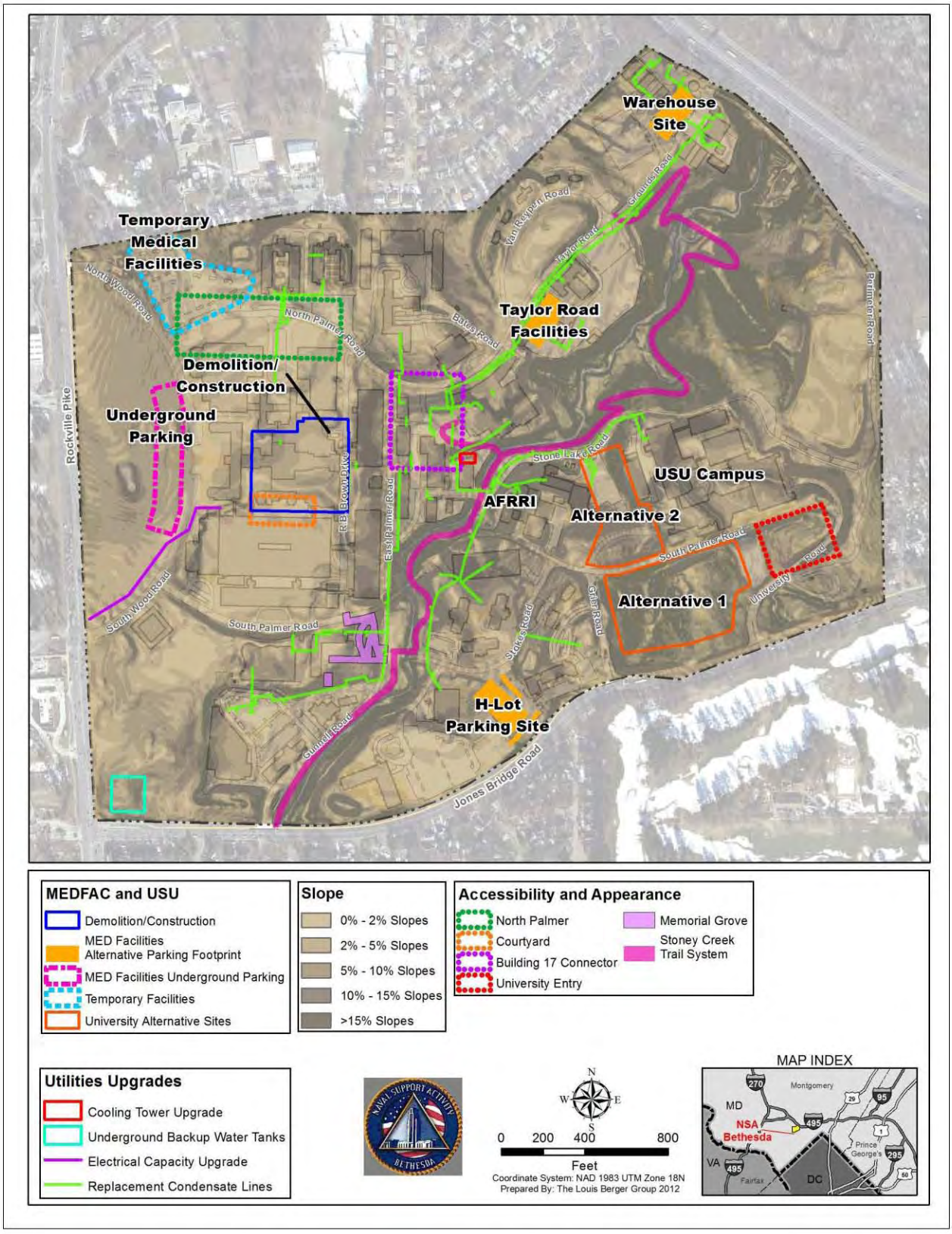
The Front Lawn of Building 1 is the site of a proposed underground parking garage and the area slopes gently down to Rockville Pike and the gate at North Wood Road and Rockville Pike. A geotechnical study, which also included a hydrogeological investigation and detailed topography study, was conducted to help determine feasibility of the underground parking garage located under the Front Lawn. The study concluded that the site has geology and hydrogeology suitable for construction of an underground parking garage. Additionally, the study found that the bedrock subsurface profile dips from south to north and there is a relatively shallow aquifer in this area (NAVFAC, 2011k).

3.1.1.2 Geology and Topography - University Expansion

There are two sites associated with alternatives for the University Expansion. Alternative 1, south of South Palmer Road across from Building 71, has a steep and varied topography, with several areas on the western half of the site exceeding 15 percent slope, and several other areas at 10 to 15 percent slope. The flattest area on the site is a rectangular area immediately south of the southwest end of Building 71.

Alternative 2, between the existing AFRRI facility and the USU campus, is mostly flat; it had been graded to accommodate the existing N-Lot. However, there are some 10 to 15 percent slopes at the edge of the site adjacent to the existing USU campus.

Figure 3-1: Slopes and Topography at NSA Bethesda



3.1.2 Soils

The soil survey map for Montgomery County, Maryland indicates that the surface deposits within NSA Bethesda are composed of a combination of urban land and native soils (USDA, 2007a). Urban land is found in developed areas while the predominant native soil type is Glenelg. The surface and subsurface layers of each of the native soils on NSA Bethesda are silt loam in texture. These soils have a high proportion of fine particles, silts, and clays and are rated as having either a moderate or severe hazard of erosion. Where these fine soils are disturbed or are not covered with sufficient vegetation, they are subject to excessive erosion (NNMC, 2000).

With the exception of soils in the floodplain of Stoney Creek, all of the natural soils on NSA Bethesda are residual soils, which developed in place due to the weathering of the underlying rock (saprolite). Saprolites contain predominantly quartz and a high percentage of kaolinite with other clay minerals that are formed by chemical decomposition of primary minerals (NNMC, 2000). Within NSA Bethesda, there are 12 soil mapping units representing seven different soil types. The predominant native soil type on the property is Glenelg silt loam; it occupies almost 50 percent of the land area on the property. Other soil types found include Gaila, Glenville, Baile, Brinklow, Blocktown, and Urban Land. The distribution of these soils is shown in Figure 3-2 with the areas of the proposed actions that would require soil disturbance overlain (USDA, 2007a). Table 3-1 only describes the characteristics of the soil types associated with the components of the proposed actions (USDA, 2007b). This table does not describe the types of soil that reside on NSA Bethesda that are not anticipated to be impacted by the Medical Facilities Development or the University Expansion. However, all soil types occurring within in NSA Bethesda are shown in Figure 3-2.

Figure 3-2: Soil Map Units Occurring within NSA Bethesda

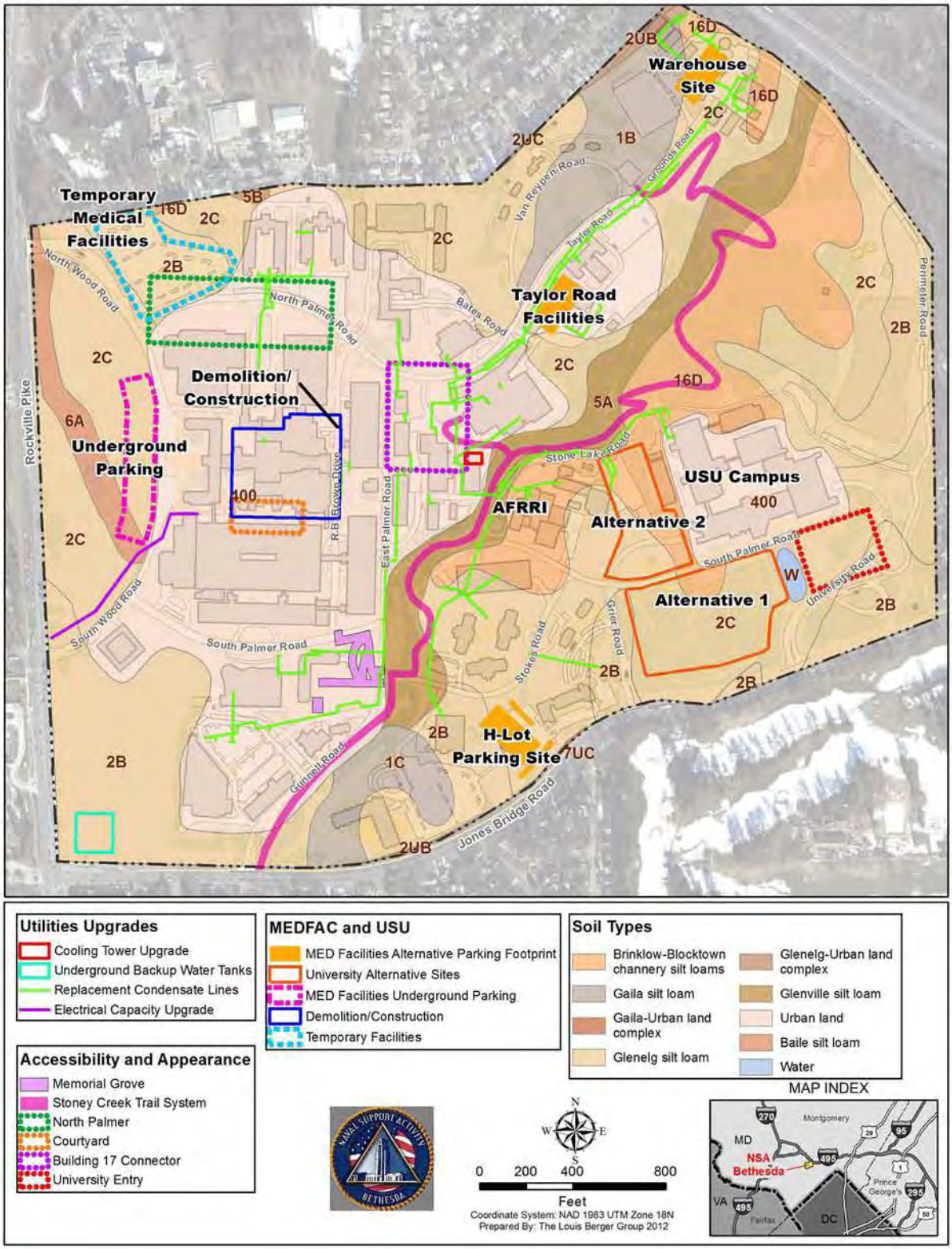


Table 3-1: Descriptions of the Soil Types Associated with the Components of the Proposed Actions

Map Symbol	Map Unit Name	Soil Map Unit Description	Proposed Actions' Components Associated with Soil Type
6A	Baile Silt Loam 0 to 3 percent slopes	The Baile series consists of very deep, poorly drained, moderately low to moderately high saturated hydraulic conductivity, soils on upland depressions and foot slopes. Depth to a root restrictive layer is greater than 60 inches. Water movement in the most restrictive layer is moderately low. Shrink swell potential is low. This soil is not flooded or ponded; it meets hydric criteria. Organic matter content in the surface horizon is about 2 percent.	This type of soil unit is found on a small portion of the southwestern-most corner of the proposed underground parking garage site for the Medical Facilities Development.
16D	Brinklow/Blocktown Channery silt loam 15 to 25 percent slopes	Brinklow/Blocktown soils consist of shallow to moderately deep, well-drained soils with moderately slow to moderate permeability. The natural drainage class for Brinklow/Blocktown soils is well-drained, the soil is not flooded or ponded, and there is no zone of water saturation within a depth of 72 inches. There are minor differences between the components' depth to bedrock, water movement, and shrink swell potential. The Brinklow component's depth to a root restrictive layer (lithic bedrock) is 20 to 40 inches. Water movement in the most restrictive layer is	This type of soil unit is found on: - Portions of all of the Medical Facilities Development's proposed parking garage sites. - Small portions of the University Expansion: Alternative 1 site. - Half of the University Expansion: Alternative 2 site. - Approximately half of the improvements which would occur to Stoney Creek pathway and portions of the University Entry improvements, which are a part of the accessibility and appearance improvements under the Medical Facilities Development.

Map Symbol	Map Unit Name	Soil Map Unit Description	Proposed Actions' Components Associated with Soil Type
		moderately high. Available water to a depth of 60 inches is low; and shrink swell potential is moderate. Organic matter content in the surface horizon is about 2 percent. The Blocktown component's depth to a root restrictive later (in this instance paralithic bedrock) is only 10 to 20 inches. Water movement in the most restrictive layer is moderately high, and available water to a depth of 60 inches is very low. Shrink swell potential is also low. These soils can be highly erodible with very shallow bedrock.	
1B	Gaila silt loam 3 to 8 percent slopes	Gaila silt loams are very deep and well drained, with depth to a root restrictive layer greater than 60 inches. Water movement in the most restrictive layer is moderately high. Shrink swell potential is low. This soil is not flooded or ponded. There is no zone of water saturation within a depth of 72 inches. Available water to a depth of 60 inches is moderate. Organic matter content in the surface horizon of Glenelg soils is about 2 percent. Gaila soils are generally not well suited for development (USDA, 2007).	This type of soil unit is found on: - Some of the site for the warehouse area parking garage alternative for the Medical Facilities Development. - A small portion of the Building 17 connector, which is a part of the accessibility and appearance improvements under the Medical Facilities Development.
2B	Glenelg silt loam 3 to 8 percent	The Glenelg component's depth to a root restrictive layer is	This type of soil unit is found on:

Map Symbol	Map Unit Name	Soil Map Unit Description	Proposed Actions' Components Associated with Soil Type
	slopes	greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent.	- Portions of all of the Medical Facilities Development's proposed parking garage sites. - Some of the site for the University Expansion: Alternative 1. - The proposed temporary medical facilities and the utilities that would support these facilities, which would be part of the Medical Facilities Development. - A portion of University Entry improvements, which are part of the accessibility and appearance improvements under the Medical Facilities Development. - The area of land where the cooling tower upgrades would occur, which are a part of the utility upgrades under the Medical Facilities Development.
2C	Glenelg silt loam 8 to 15 percent slopes	The Glenelg component's depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon	This type of soil unit is found on: - Portions of all of the Medical Facilities Development's proposed parking garage sites. - The site for the University Expansion: Alternative 1. - Half of the University Expansion: Alternative 2 site. - A small portion of the Building 17 connector site and a small portion of the Stoney Creek pathway improvements, which are a part of the

Map Symbol	Map Unit Name	Soil Map Unit Description	Proposed Actions' Components Associated with Soil Type
		is about 2 percent.	accessibility and appearance improvements under the Medical Facilities Development.
5A	Glenville silt loam 0 to 3 percent slopes	The Glenville component's depth to a root restrictive layer is 60 to 99 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink swell potential is low. This soil is not flooded, nor ponded. Organic matter content in the surface horizon is about 3 percent. Glenville soils are wet soils and are not well suited for development due to poor drainage.	This type of soil unit is found on approximately half of the Stoney Creek pathway improvements, which are a part of the accessibility and appearance improvements under the Medical Facilities Development.
400	Urban land	These mapping units are formed in manmade cut and fill areas, which are generally near industrial sites, urban developments, or other construction sites. This unit is excessively-drained to moderately well-drained, with considerable variation in the depth to the seasonal high water table, and permeability that is dependent on topography, degree of compaction, soil texture, and other related factors. The texture, stone content, soil pH, and depth to bedrock varies considerably from one area to another; but in	This type of soil unit is found on: - The site of building demolitions and renovations and the construction of building C for the Medical Facilities Development as well as the Taylor Road Facilities site. - A small area of the site for the warehouse area parking garage for the Medical Facilities Development. - The courtyard and memorial grove as well as a majority of the North Palmer Road improvements and a majority of the Building 17 connector

Map Symbol	Map Unit Name	Soil Map Unit Description	Proposed Actions' Components Associated with Soil Type
		general, bedrock is at depths greater than 60 inches. This unit is generally poorly suited for farming or recreation. Onsite investigation is needed to determine feasibility for any purpose.	as well as a small portion of the Stoney Creek pathway and the University Entry improvements, which are a part of the accessibility and appearance improvements under the Medical Facilities Development.
Source: USDA, 2007b.			

3.2 Water Resources

3.2.1 Surface Water

NSA Bethesda is located within the Rock Creek watershed, which is the second largest watershed in Montgomery County with a drainage area of approximately 60 square miles. Distinct geologic characteristics along the MD Route 28 corridor, approximately 6 miles north of NSA Bethesda, divide the watershed and form the upper and lower watersheds of Rock Creek (MDEP, 2001). The Lower Rock Creek Watershed, where NSA Bethesda is located, is highly developed and densely populated and many of the headwater areas have been piped, impacting aquatic habitat and stream systems. The high level of development and lack of stormwater controls have led to unmitigated flows that have damaged Rock Creek and its tributaries, including Stoney Creek, a portion of which traverses NSA Bethesda. The Maryland Department of the Environment (MDE) has identified the Rock Creek Watershed in Montgomery County in the State's 303(d) regulation as impaired by nutrients, sediments, bacteria, and impacts on biological communities (MDE, 2008). The District of Columbia has also established a fecal bacteria total maximum daily load for the portion of the Rock Creek within the District's boundaries (USEPA, 2004).

Stoney Creek enters the southwest portion of NSA Bethesda near the intersection of Jones Bridge Road and Wisconsin Avenue and flows northeast to the property boundary where it crosses under I-495 and ultimately flows into Rock Creek (Figure 3-3). Stoney Creek is designated as a Class I surface water by MDE. Uses for Class I waters include water contact, recreation, aquatic life, and agricultural and industrial water supply. The Stoney Creek Watershed is approximately 565 acres and includes portions of NSA Bethesda, the Bethesda Central Business District (CBD), NIH, and residential areas. The 182 acres of NSA Bethesda property within the Stoney Creek Watershed comprise approximately 32 percent of the watershed (NNMC, 2000). The northwest portion of NSA Bethesda, outside of the Stoney Creek Watershed, drains

to another smaller tributary of Rock Creek outside the campus boundary.

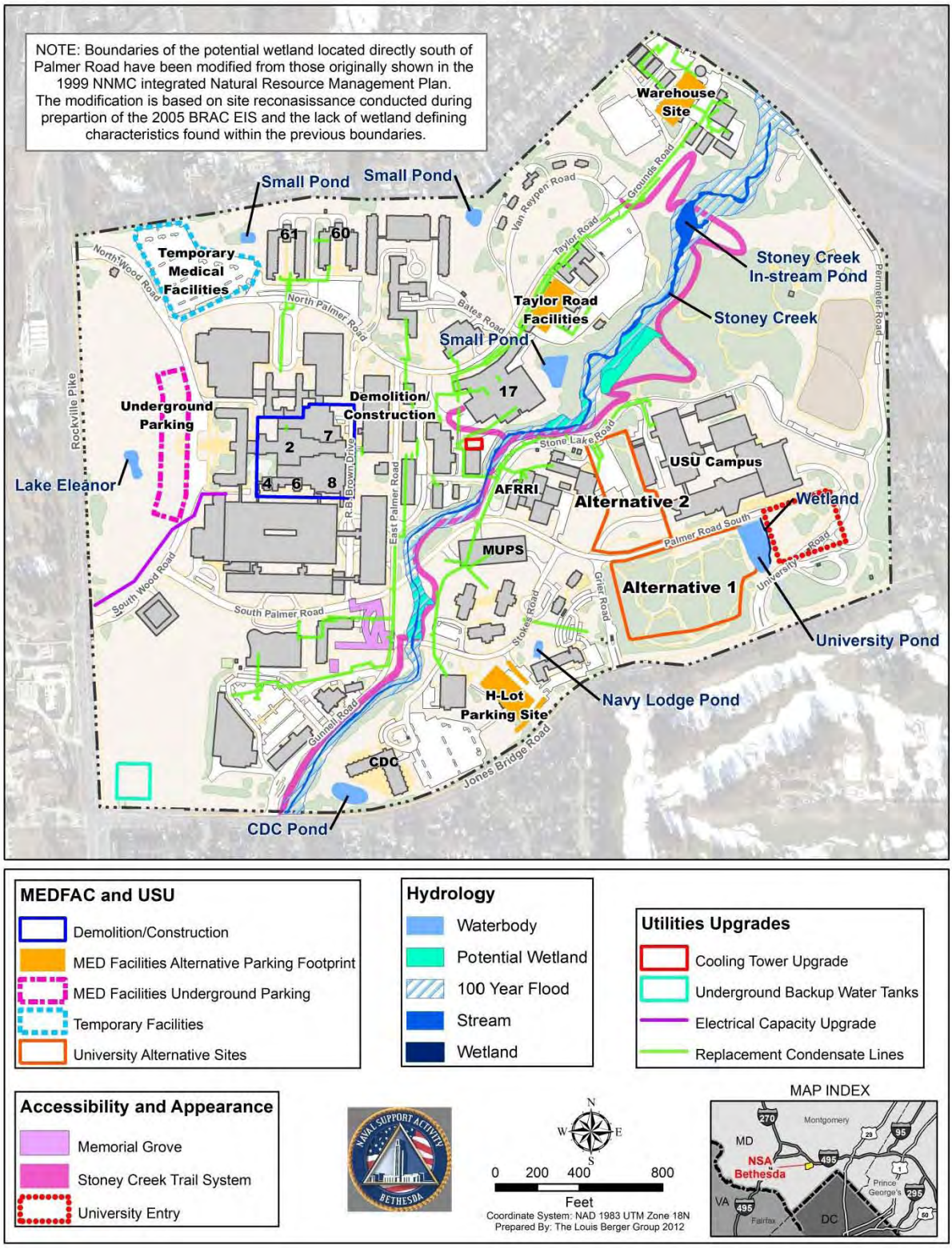
The watershed (both inside and outside of NSA Bethesda) of Stoney Creek is urbanized and a largely impervious surface. Within NSA Bethesda, approximately 103 acres of a total of 243 acres are currently considered impervious including pavement, sidewalks, and rooftops. Impervious surfaces decrease the amount of rainfall allowed to infiltrate into the soil and increase the volume and velocity of stormwater runoff entering surface drainages during storm events. Flow within Stoney Creek peaks at a relatively high rate of discharge during rainfall events and over time the increased stream flow velocities have eroded the stream banks and widened the creek (NAVFAC, 2010b). NSA Bethesda has attempted to stabilize portions of the stream banks through the use of gabions and armoring, thereby decreasing the overall erosion to Stoney Creek.

In addition to Stoney Creek, there are six freshwater ponds on NSA Bethesda used for stormwater management. They include ponds southwest of CDC, north of the Navy Lodge, east of Building 17, west of Building 61, east of Building 62, and one located on the northwest side of the Multi-Use Parking Structure. Additionally, there are three freshwater ponds that are not used for stormwater retention; these ponds are Lake Eleanor, University Pond, and the in-stream pond located on the northeast end of the installation along Stoney Creek. See Figure 3-3 for the locations of these ponds.

As Figure 3-3 shows, Lake Eleanor is located in front of Building 1 just west of the proposed underground parking garage. This lake, the only natural pond on NSA Bethesda, existed as a spring-fed pond when the installation was first constructed. The pond was later made into a small lake, christened Lake Eleanor, and is still spring-fed to some degree (see Section 3.2.1, Groundwater, for a more detailed description of its water sources). All other ponds are manmade.

As Figure 3-3 shows, University Pond is located between Jones Bridge Road and USU and is fed primarily by off-campus runoff. It is adjacent to the proposed University Expansion Alternative 1 site.

Figure 3-3: Hydrology at NSA Bethesda



None of the proposed projects are located in the vicinity of the CDC pond or the pond near Building 62, while the proposed temporary medical facilities would be located to the east of Building 61. The proposed H-Lot parking structure would be near the Navy Lodge pond, and the proposed upgrades to the Stoney Creek Trail System would be near the in-stream pond created by a dam across Stoney Creek, as well as in proximity to two bioretention ponds in Stoney Creek. The pond east of Building 17 would be located directly south of the Taylor Road Facilities parking garage if it is constructed.

3.2.2 Groundwater

In areas such as NSA Bethesda where the terrain is underlain by crystalline bedrock, there are typically two aquifers: a principal aquifer located within the fractured bedrock matrix and a shallow aquifer located at and slightly above the overburden/bedrock interface. The shallow aquifer provides water to the principal aquifer by diffuse recharge through openings at the bedrock interface (NAVFAC, 2011). However, a study undertaken by the U.S. Geological Survey in 2004 in the vicinity of the Medical Center Metro station, located adjacent to NSA Bethesda along Rockville Pike, found very low hydraulic conductivity between the shallow and principal aquifers; possibly because the fractures in the bedrock in proximity to the overlying saprolites are filled with byproducts of rock weathering, resulting in reduced flow (Greene et al., 2004).

Groundwater at NSA Bethesda occurs in the overlying saprolites, at a depth ranging from 10 to 50 feet below the natural ground surface. Boring data from properties adjacent to NSA Bethesda indicate that this most frequently occurs 20 to 30 feet below the surface (NIH, 2005). The saprolites act as one uniform groundwater storage reservoir, and do not respond to precipitation events. Wells or excavations encountering the stored groundwater do not produce much drawdown (Green et al., 2004).

In 2011, a hydrogeological investigation was conducted in the vicinity of Lake Eleanor where the new underground parking garage is proposed. This investigation found groundwater levels were greater than 30 feet (NAVFAC, 2011k). Groundwater flow in the area is generally to the north, and the recharge zone for the shallow aquifer is located in the upland south of Lake Eleanor, near Jones Bridge Road (NAVFAC, 2011k). Several sources recharge and maintain the water level in Lake Eleanor. The majority of the recharge is from rain water and infiltration from the shallow (saprolite) aquifer, while a limited amount is provided by a spring located in the fractured bedrock aquifer (Pers. Comm., Hillis, 2012 and NAVFAC, 2011k).

3.2.3 Floodplains

No developed area of NSA Bethesda is located within a FEMA regulated 100-year floodplain (FEMA, 2011). While not FEMA regulated, Stoney Creek has a 100-year floodplain that was modeled in 1998 (NNMC, 2000). The extent of the floodplain is very limited as it is constrained by

the steep slopes of the creek banks (Figure 3-3). While this protects the majority of the installation from flooding impacts, a 100-year flood event in Stoney Creek would flood some structures, including the foot-bridge just downstream of Jones Bridge Road where Stoney Creek enters NSA Bethesda, and the foot-bridge over the in-stream dam (NNMC, 2000). Prior to its redesign in 2012, the Perimeter Road Bridge where Stoney Creek leaves NSA Bethesda at the northeast boundary was subject to flooding. As part of the redesign, the road was raised 5 feet and the culverts were increased in size. Though flood mapping for this area has not been reevaluated, the redesign of the bridge likely would prevent flooding of the structure in the future (Pers. Comm., Hillis, 2012). The only proposed project that would be located within the floodplain of Stoney Creek is the improvement to the Stoney Creek Trail System.

3.2.4 Wetlands

Wetlands are jointly defined by USEPA and the U.S. Army Corps of Engineers as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include "swamp marshes, bogs and similar areas" (40 CFR 230.3[t] and 33 CFR 328.3[b]). Freshwater wetlands in Maryland are protected by the Nontidal Wetlands Protection Program, which sets a state goal of no overall net-loss of non-tidal wetlands acreage and functions.

Activities in non-tidal wetlands require a non-tidal wetland permit or a letter of exemption, unless the activity is exempt by regulation. Any activity that involves excavating, filling, changing drainage patterns, disturbing the water level or water table, grading, and removing vegetation in a non-tidal wetland or within a 25-foot buffer, requires a permit.

Within NSA Bethesda, there is only one area that has been delineated as a wetland. In 2008, the perimeter of University Pond, which is east of the University Expansion Alternative 1 site, was investigated and it was determined that there is approximately 0.03 acre of non-persistent palustrine emergent wetland along the northeastern edge of the pond (NNMC, 2008). No other wetlands associated with the pond were found. There are several areas along Stoney Creek, one directly south of South Palmer Road and two north of Stone Lake Road, that are considered potential wetlands in the 1999 NNMC Integrated Natural Resources Management Plan (INRMP) (NNMC, 2000) (Figure 3-3). The area south of South Palmer Road and a small area north of Stone Lake Road are in the vicinity of the proposed improvements to the Stoney Creek Trail System.

3.3 Biological Resources

NSA Bethesda has natural (unlandscaped) vegetated areas that provide habitat for wildlife occurring in the area, and extensive landscaped areas that provide aesthetic beauty to the installation.

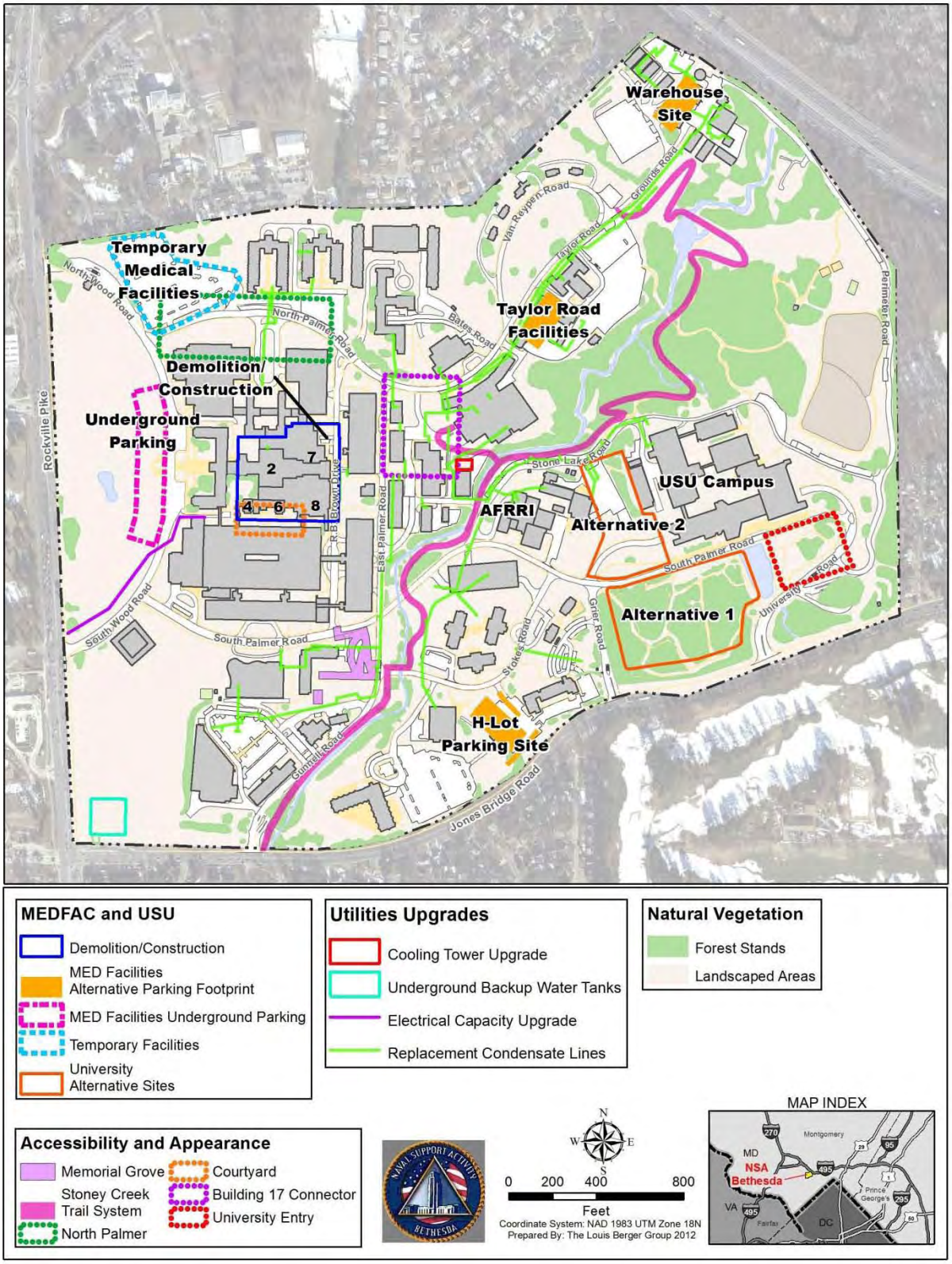
3.3.1 Vegetation

3.3.1.1 Natural Vegetation Areas

NSA Bethesda includes approximately 32.2 acres of forested habitat. The largest natural areas at NSA Bethesda are the forests situated to the north and south of the University (see Figure 3-4). Other smaller natural areas include the in-stream pond, the stream corridor areas, and 20 acres of forested buffers along roads and Stoney Creek (NNMC, 2000). The forested areas at NSA Bethesda were previously disturbed and are generally the result of natural reforestation and/or planting following the purchase of the property by the Navy. The forested areas at the installation resemble many others in suburban Montgomery County.

A biological survey in 2008 to document native and non-native plant species at NSA Bethesda resulted in the identification of a total of 160 species. Much of the natural area at NSA Bethesda is dominated by mature, mixed hardwood forests that have a dense overstory, a moderate to dense shrub layer, and a sparse to moderate herbaceous layer, depending on site conditions. The forested areas primarily consist of tulip tree (*Liriodendron tulipifera*), white oak (*Quercus alba*), and northern red oak (*Q. rubra*) on dry to mesic sites; and boxelder (*Acer negundo*), syacamore (*Platanus occidentalis*), and sweetgum (*Liquidambar styraciflua*) on wetter sites and floodplains. Common understory trees include dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), red maple (*Acer rubra*), and American holly (*Ilex opaca*). Several of the steep slopes adjacent to Stoney Creek support masses of mountain laurel (*Kalmia latifolia*), whereas other areas have scattered shrubs such as witchhazel (*Hamamelis virginiana*), spicebush (*Lindera benzoin*), and several viburnums (*Viburnum acerifolium, V. dentatum, and V. prunifolium*). A large variety of spring wildflowers, including bloodroot (*Sanguinaria canadensis*), spring beauty (*Claytonia virginica*), early saxifrage (*Saxifraga virginiensis*), cut-leaved toothwort (*Dentaria laciniata*), mayapple (*Podophyllum peltatum*), and rue anemone (*Thalictrum thalictroides*), were evident during the early spring site visits (NAVFAC, 2009a). The complete results of the survey are found in *Biological Surveys and Management Plan National Naval Medical Center Bethesda, Maryland* (NAVFAC, 2009a).

Figure 3-4: Forested Stands at NSA Bethesda



Forested Area Adjacent to the Warehouse Site: This small triangular patch of forest (approximately 4.8 acres) along the northeast boundary of NSA Bethesda is located between Perimeter Road and a former golf fairway, now a mowed field. Dominant tree species include large white oaks and red oaks. Shrubs and herbaceous species include spring beauty (*Claytonia virginica*), star chickweed (*Stellaria pubera*), cut-leaved toothwort, trout-lily (Erythronium americanum), and lady fern (*Athyrium filix-femina*).

Forested Area South of USU (University Expansion Alternative 1 Site): This forested area containing approximately 7.4 acres is located south of USU towards Jones Bridge Road. This area contains mature woods with many large trees, including several yellow poplars that are over 100 feet tall and about 3 feet in diameter. Spicebush is the dominant native shrub, with bush honeysuckle crowding out the spicebush in many places.

Forest Buffers and Maintained Trees: In addition to the forested areas, 20 acres of natural and maintained forested buffer areas occur at NSA Bethesda. These edge habitats generally occur along fence rows, beside roadways, and generally follow the perimeter of the campus. The buffer areas contain a combination of the predominant hardwood tree types plus an abundance of shrubby vegetation, sometimes forming dense thickets.

Stream Corridor: The stream corridor areas along Stoney Creek contain a diversity of native and naturalized plant species mixed in with cultivated plants. Species occurring near the stream include poison ivy (*Toxicodendron radicans*), pokeweed (*Phytolacca americana*), common milkweed (*Asclepias syriaca*), black cherry (*Prunus serotina*), and American holly (*Ilex opaca*). Many wildflowers occur on the slope including the native wild sarsaparilla (*Aralia nudicaulis*), spring beauty, false Solomon's seal (*Smilacina racemosa*), squawroot (*Conopholis americana*), spotted wintergreen (*Chimaphila maculata*), and bluestem goldenrod (*Solidago caesia*). Open grassy areas contain planted specimens of native trees such as yellow poplar, white oak, black walnut (*Juglans nigra*), black willow, and white pine (*Pinus strobus*), as well as non-native trees such as Norway spruce (*Picea abies*) and European larch (*Larix decidua*).

3.3.1.2 Landscaped Vegetation Areas

Landscaped areas at NSA Bethesda include turf lawns, flower beds, individual shrubs, hedges, groundcover areas, a Bay Scapes demonstration area, and landscaped trees. Presently, maintenance crews mow and trim the lawn throughout the growing season and apply a pre- and post-emergent herbicide and fertilizer. Leaves are raked and/or blown. Roses are sprayed, fertilized, and pruned. Beds are weeded, planted, and mulched.

Large tracts of land at NSA Bethesda maintained as turf lawns are scattered throughout the installation. The largest open lawn is in

front of Building 1, along Rockville Pike. This was used for BRAC construction staging, but is being returned to open lawn upon conclusion of that construction. Interspersed throughout the improved lawns and maintained areas at NSA Bethesda are numerous individual landscaped trees, including cedar (*Chamaecyparis sp.*), red oak, willow oak (*Quercus phellos*), yellow poplar, white pine, red pine (*Pinus resinosa*), southern magnolia (*Magnolia grandiflora*), Saucer magnolia (*Magnolia soulangiana*), maple (*Acer* sp.), cypress, larch (*Larix* sp.), and spruce (*Picea* sp.). Invasive species occur throughout the landscaped areas of NSA Bethesda and include common mulberry (*Morus nigra*), Japanese honeysuckle, Amur honeysuckle (*Lonicera maackii*), Porcelain-berry vine (*Ampelopsis brevipedunculata*), English ivy, and euonymus.

Tables 3-2 and 3-3 summarize where the proposed project sites, under the Medical Facilities Development and Alternatives 1 and 2 for University Expansion, would occur - in areas that are developed or have been previously developed with landscaped vegetation or in areas of natural vegetation. It is noted again that forested areas at NSA Bethesda were previously disturbed and have been reforested. Figure 3-4 shows the proposed project sites under the proposed actions in relation to NSA Bethesda's forested stands.

3.3.2 Wildlife

Natural and landscaped vegetated areas on NSA Bethesda provide habitat to wildlife occurring in the area. A terrestrial vertebrate faunal survey was conducted in 1999 to document wildlife species that inhabit NSA Bethesda. The complete list of species observed during the 1999 survey is found in Appendix C of the *NNMC Draft Integrated Natural Resources Management Plan* (NNMC, 2000). Additionally, a biological survey was conducted in 2008 to document migratory birds, threatened and endangered species, benthic species, and nuisance wildlife species at NSA Bethesda. The complete results of the survey are found in *Biological Surveys and Management Plan National Naval Medical Center Bethesda, Maryland* (NAVFAC, 2009a).

3.3.2.1 Hardwood Forest Community

Hardwood forest communities, such as the forested areas found on NSA Bethesda, provide food and cover for both game and non-game species, including: mammals such as white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), gray squirrel (*Sciurus niger*), beaver (*Castor canadensis*), red fox (*Vulpes vulpes*) and gray fox (*Urocyon cinereargenteus*); birds such as hairy and downey woodpecker (*Picoides villosus, P. pubescens*), wood thrush (*Hylocichla mustelina*), and Carolina chickadee (*Poecile carolinensis*); amphibians such as eastern spadefoot toad (*Scaphiopus holbrookii*) and red backed salamander (*Plethodon cinereus*); and reptiles such as eastern hognose snake (*Heterodon platirhinos*) and copperhead (*Agkistrodon contortrix*). The gray fox has not been observed recently, but is indigenous to this area of Maryland.

Table 3-2: Description of Terrestrial Vegetation for Proposed Project Sites (Medical Facilities Development)

Project Sites	Vegetation Type
Construction of Building C	Mostly developed area with a small landscaped area with a few trees; currently site of Buildings 2, 4, 6, 7, and 8 of Main Hospital Complex.
Demolition of Buildings 2, 4, 6, 7, and 8 of Hospital Complex	Developed area of the Hospital Complex.
Construction of underground parking garage	Mowed lawn area west of Building 1.
Warehouse area above-ground parking	Developed area; located within existing industrial and warehouse area in the northeast corner of the installation.
H-Lot above-ground parking	Developed area with asphalt surface containing H-Lot parking.
Taylor Road Facilities above-ground parking	Developed area; currently occupied by Buildings 28, 53, and 59 on the northeast portion of the installation.
Internal renovations of Buildings 1, 3, 5, 9, 10, and 13	Interior renovation only; does not require external construction.
G-Lot Temporary Medical Facility	Developed area, G-Lot.
Accessibility and improvement projects	Mostly developed and landscaped areas throughout the installation in addition to the maintained natural forest areas around the Stoney Creek Trail.
Demolition/Construction of Cooling Towers	Developed area, current site of three existing cooling towers.
Utilities upgrades	Developed area, along roads and landscaped areas throughout the installation.
External and internal renovations of Building 13	External renovation would not affect natural or landscaped vegetation.

Table 3-3: Description of Terrestrial Vegetation for Proposed Project Sites (University Expansion)

Project Site	Alternative 1	Alternative 2
Construction of University Expansion (proposed future USU Building F)	Forested area east of Grier Road and south of USU campus.	Previously developed N-Lot parking lot and landscaped green space between USU and AFRRI with trees along the slope.
Construction of 400-space parking structure	Forested area east of Grier Road and south of USU campus.	Previously developed N-Lot parking lot and landscaped green space between USU and AFRRI with trees along the slope.
Renovation and modernization in Buildings A, B, C, and ground floor	Internal renovation of Buildings A, B, C, and ground floor.	Same as Alternative 1.

3.3.2.2 Shrub Habitat

A number of species use or require shrub habitat. The shrub habitat found on NSA Bethesda includes both those shrubby areas of the large tracts of forested areas and the riparian buffer areas. It also includes ornamental and maintained shrubs and hedgerows. Wildlife use these areas for shelter and protection, as well as for nesting among bird species. Shrub areas also provide foraging areas for many species that eat insects, berries, or seeds. Wildlife occurring in this habitat include: mammals such as white-footed mouse (*Peromyscus leucopus*), meadow vole (*Microtus pennsylvanicus*), red fox, and shorttail shrew (*Blarina brevicauda*); birds such as American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), goldfinch (*Carduelis tristis*), and eastern bluebird (*Sialia sialis*); amphibians such as American toad (*Bufo americanus*), green frog (*Rana clamitans*), and spotted salamander (*Ambystoma maculatum*); and reptiles such as eastern mud turtle (*Kinosternon subrubrum*), six-lined racerunner (*Cnemidophorus sexlineatus*), and Eastern banded water snake (*Nerodia fasciata*).

3.3.2.3 Developed Community

Many wildlife species use the lawns, gardens, and a variety of ornamental trees and shrubs within the developed areas on NSA Bethesda. These species include mammals such as opossum, gray squirrel, and raccoon; birds such as house sparrow (*Passer domesticus*), common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), and northern cardinal (*Cardinalis cardinalis*); amphibians such as chorus frog (*Pseudacris triseriata*) and Fowler's toad (*Bufo fowleri*); and reptiles such as eastern box turtle (*Terrapene carolina*), and black rat snake (*Elaphe obsoleta*). The developed areas are in proximity to the forested and landscaped areas, lending to a situation in which wildlife species occurring on the site are close to humans on a regular basis. The majority of the project components occur within this cover type/community.

3.3.2.4 Neotropical Migratory Birds and Forest Interior Dwelling Species

Migratory birds are those species that migrate south each fall for the winter and return north in the spring to their breeding grounds. The 2008 Biological Survey observed several migratory bird species at NSA Bethesda, with the five most abundant species observed being American robin, European Starling, Canada goose, northern cardinal, and mourning dove (*Zenaida macroura*). Other migratory birds observed included the wood thrush (*Hylocichla mustelina*), Eastern kingbird (*Tyrannus tyrannus*), Ruby-crowned Kinglet (*Regulus calendula*), gray catbird (*Dumetella carolinensis*), Acadian flycatcher (*Empidonax virescens*), eastern wood-pewee (*Contopus virens*), Carolina chickadee (*Poecile carolinensis*), eastern towhee (*Pipilo erythrophthalmus*), gray catbird (*Dumetella carolinensis*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), great blue heron (*Ardea herodias*), peregrine falcon (*Falco peregrinus*), red-shouldered hawk (*Buteo lineatus*), and Eastern phoebe (*Sayornis phoebe*). The 2008 survey results showed an average of approximately 33 resident Canada geese (*Branta canadensis*) at NSA Bethesda, while an average of approximately 65 migrants were observed during the months of September through February. The complete results of the survey are found in *Biological Surveys and Management Plan National Naval Medical Center Bethesda, Maryland* (NAVFAC, 2009a).

Migratory birds are protected under the Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. 703-712; 40 Stat. 755) as amended. "[I]t shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof…"(16 U.S.C. 703). Any take of a migratory bird would require a permit from the USFWS. The regulations governing migratory bird permits are found in 50 CFR part 13 (General Permit Procedures) and 50 CFR part 21 (Migratory Bird Permits).

In addition, pursuant to EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), an MOU between the DoD and the USFWS outlines a collaborative approach to promote the conservation of migratory bird populations (DoD and USFWS, 2006). This MOU identifies specific activities that would contribute to the conservation of migratory birds and their habitats but does not authorize the take of migratory birds.

Beginning in 2007, NSAB began implementing Canada goose population control under the USFWS Nest and Egg Depredation Order (NAVFAC,

2009a). This allows NSAB to take eggs or nests of resident geese to prevent overpopulation. Nests and eggs may be taken only between March 1 and June 30.

Many neotropical migrants are also forest interior dwelling species (FIDS) and require relatively large contiguous forest areas (greater than 100 acres) to sustain viable breeding populations. Although a formal survey for FIDS has not been conducted on the installation, there is a low possibility that some of these species could nest at NSA Bethesda, due to the fact that FIDS require mature forests with a closed canopy that remains fairly undisturbed (NNMC, 2000). The forested areas at NSA Bethesda are not contiguous and are further fragmented by asphalt paths. In addition, human activity in the wooded areas and in their immediate vicinity might discourage birds in need of interior forest conditions from nesting there.

3.3.3 Aquatic and Wetland Habitat

Aquatic habitats on NSA Bethesda consist of Stoney Creek, University Pond, the in-stream pond on Stoney Creek, and Lake Eleanor (see Section 3.2, Water Resources). The majority of the proposed project sites for Medical Facilities Development and the University Expansion are not located in areas that provide habitat for aquatic species, except for a few small areas (0.11 acre) designated for the proposed Stoney Creek Trail System.

Within NSA Bethesda there are three areas along Stoney Creek that have the potential to be wetlands. To date, these potential wetland areas have not been delineated and no jurisdictional determination has been conducted (NNMC, 2000). Species using these areas would primarily include amphibians and invertebrates such as worms, snails, insects, and crustaceans (NNMC, 2000).

3.3.4 Threatened and Endangered Species

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species or their critical habitat are known to exist within the project areas at NSA Bethesda. Coordination with USFWS and MDNR regarding rare, threatened, and endangered species is included in Appendix A. USFWS has responded that, except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area and, therefore, Section 7 consultation is not required (USFWS, 2011). MDNR has determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites and, therefore, the agency does not have specific comments or requirements pertaining to protection measures at this time (MDNR, 2011).

3.4 Air Quality

USEPA defines ambient air in 40 CFR 50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has

access." In compliance with the 1970 Clean Air Act and the 1977 and 1990 Clean Air Act Amendments, USEPA has promulgated National Ambient Air Quality Standards (NAAQS). The NAAQS were enacted for the protection of the public health and welfare, allowing for an adequate margin of safety. To date, USEPA has issued NAAQS for the following criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (particles with a diameter less than or equal to a nominal 10 micrometers [PM_{10}] and particles with a diameter less than or equal to nominal 2.5 micrometers [$PM_{2.5}$]), ozone (O_3), nitrogen dioxide (NO_2), and lead. The USEPA classification for the Metropolitan Washington, DC, area, which includes Montgomery County and NSA Bethesda, is discussed in detail in Section 3.4.1.

3.4.1 Air Quality General Conformity

Federal regulations designate Air-Quality Control Regions (AQCRs) in violation of the NAAQS as nonattainment areas. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme. Severity categories have not yet been applied to $PM_{2.5}$ nonattainment areas. USEPA classified the Metropolitan Washington, DC area (AQCR 47), which includes Montgomery County and NSA Bethesda, as in moderate nonattainment for the 8-hour ozone NAAQS and in nonattainment for $PM_{2.5}$. Montgomery County was also previously in nonattainment for CO, but has since come into attainment. To prevent slipping back into nonattainment, the county is listed as in maintenance for CO. Additionally, AQCR 47 is in the ozone transport region, which is the northeastern section of the United States where ozone is transported by air currents into regions from other areas of the United States. AQCR 47 is in attainment for all other criteria pollutants.

Table 3-4 shows the NAAQS for ozone, $PM_{2.5}$, and carbon monoxide.

Table 3-4: Ambient Air Quality Standards

Pollutant	Federal Standard	Maryland Standard
Ozone (O_3)*		
8-Hour Average	0.075 ppm	0.075 ppm
Particulate Matter ($PM_{2.5}$)*		
24-Hour Average	35 µg/m^3	35 µg/m^3
Annual Geometric Mean	15 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)*		
8-Hour	9 ppm	9 ppm
1-Hour	35 ppm	35 ppm

* Federal primary and secondary standards for this pollutant are identical.
(Sources: USEPA, 2011; MDE, 2007)
Ug/m3 – micrograms per cubic meter
ppm – parts per million

To regulate the emission levels resulting from a project, Federal actions located in nonattainment or maintenance areas are required to demonstrate compliance with the general conformity guidelines established in 40 CFR Part 93, Determining Conformity of Federal Actions to State or Federal Implementation Plans (the Rule). Section 93.153 of the Rule sets the applicability requirements for projects subject to the Rule through the establishment of *de minimis* levels for annual criteria pollutant emissions. These *de minimis* levels are set according to criteria pollutant nonattainment area and maintenance area designations. For projects below the *de minimis* levels, a full conformity determination is not required. Those at or above the levels are required to perform a conformity analysis as established in the Rule. The *de minimis* levels apply to emissions that can occur during construction or operation phases of the action.

3.4.2 Air Permit Requirements

3.4.2.1 Title V Permit

NSA Bethesda operates under a Title V permit (Part 70 Draft Permit No. 24-031-01124; 8 August 2011). There are significant emission sources within the installation: 5 large commercial boilers, a large water heater, 17 emergency generators of sizes ranging from 400 to 1750 kilowatts and one 10,000-gallon and two 20,000-gallon gasoline tanks. Additionally, NSA Bethesda emissions are limited to less than 50 tons per year (TPY) total of NO_x from four of its five large boilers and 25 TPY from the fifth during any rolling 12-month period (MDE, 2011). The permit also requires that the installation take reasonable precautions to prevent PM from becoming airborne due to construction and demolition activities.

3.4.2.2 Prevention of Significant Deterioration Permits

MDE also requires Prevention of Significant Deterioration (PSD) approval for major modifications to an existing major facility that would result in a net operating emissions increase above the following levels: CO, 100 TPY; NO_x, 40 TPY; SO_2, 40 TPY; PM_{10}, 15 TPY; VOCs, 40 TPY; and Lead, 0.6 TPY.

3.4.2.3 Existing Ambient Air Quality Concentrations

Ambient air quality is monitored in Montgomery County by a station meeting USEPA's design criteria for state and local air monitoring stations and national air monitoring stations. The monitoring station, located at the Lothrop E Smith Environmental Education Center in Rockville, Montgomery County, Maryland, has been in operation for measuring ozone, $PM_{2.5}$, and meteorological conditions in the county. The highest and second highest values recorded at these stations during the period 2006 through 2010 are shown in Table 3-5, which shows a general decline in the pollutant concentration over the last 3 years.

Table 3-5: Two Highest Ozone and $PM_{2.5}$ Values, 2006 to 2010

Monitoring Station	Year				
	2006	2007	2008	2009	2010
#240313001 – Lothrop E Smith Environmental Education Center, Montgomery County – $PM_{2.5}$ (µg/m^3) 24-hour (1st / 2nd Maximum)	32/31	35.6/ 33.7	36.4/ 34.3	29.21/ 22.7	18.6/ 17.7
#240313001 – Lothrop E Smith Environmental Education Center, Montgomery County – $PM_{2.5}$ (µg/m^3) Annual Average Concentrations	11.4	11.75	9.4	10.20	9.12
#240313001 – Lothrop E Smith Environmental Education Center, Montgomery County – Ozone (ppm) 8-hour (1st / 2nd Maximum)	0.101/ 0.091	0.103/ 0.091	0.094/ 0.085	0.074/ 0.072	0.081/ 0.08

Source: USEPA, 2011c.

3.4.3 Meteorology/Climate

Temperature is a parameter used in calculations of emissions for air quality applicability. Climate at NSA Bethesda can be characterized as humid, continental with an average high temperature of 88 degrees Fahrenheit in July and an average low temperature of 25 degrees Fahrenheit in January. Summers are warm with periods of high humidity, and winters are cold, with periods of snow cover (City-data, 2011).

3.4.4 Air Emissions at Installation

As part of the Title V permit, NSA Bethesda monitors permanent stationary sources as well as generator emissions annually. Construction emissions are not included into the calculation of annual emissions. Table 3-6 shows total emissions at NSA Bethesda in 2010.

Table 3-6: Criteria Air Pollutant Emissions at NSA Bethesda, 2010

Year	NO_x (TPY)	SO_x (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	CO (TPY)	VOCs (TPY)
2010	8.89	9.15	0.91	0.90	20.90	4.23

Source: NSAB, 2010a.

3.4.5 Regional Air Quality Index Summary

USEPA calculates the Air Quality Index (AQI) for five major air pollutants regulated by the Clean Air Act: ground-level O_3, PM, CO, SO_2, and NO_2. The Metropolitan Washington Council of Governments collects data daily to determine air quality for the region and releases it in the form of the AQI. The AQI ranges from zero to 500, with zero being no air pollution and 500 representing severely unhealthy air pollution levels. An AQI value between 101 and 150 indicates that air quality is unhealthy for sensitive groups, who may be subject to negative health effects. Sensitive groups may include those with lung or heart disease, who would be more negatively affected by lower levels of ground level ozone and particulate matter than the rest of the general public. An AQI value between 151 and 200 is considered to be unhealthy, and may result in negative health effects for the general public, with more severe effects possible for those in sensitive groups. AQI values above 200 are considered very unhealthy. An AQI over 300 represents hazardous air quality (CAP, nd).

Table 3-7 displays the recent AQI data for Montgomery County and shows that an AQI over 300 has not been recorded in the area in the 2006 through 2010 period.

Table 3-7: AQI Data for Montgomery County, Maryland

Year	AQI - 101 to 150 Unhealthy for Sensitive Groups (days)	AQI - 151 to 200 Unhealthy (days)
2006	9	1
2007	16	1
2008	5	0
2009	0	0
2010	5	0

Source: USEPA, 2011d.

3.4.6 Greenhouse Gases

There is broad scientific consensus that humans are changing the chemical composition of Earth’s atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accumulation of trace greenhouse gases (GHGs), such as carbon dioxide (CO_2), in our atmosphere. An increase in GHG emissions is said to result in an increase in the Earth’s average surface temperature, which is commonly referred to as global warming. Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates,

precipitation rates, etc., all of which is commonly referred to as climate change. The Intergovernmental Panel on Climate Change best estimates are that the average global temperature rise between 2000 and 2100 could range from 0.6 degrees Celsius (with no increase in GHG emissions above year 2000 levels) to 4.0 degrees Celsius (with substantial increase in GHG emissions). Even small increases in global temperatures could have considerable detrimental impacts on natural and human environments.

GHGs include water vapor, CO_2, methane (CH_4), nitrous oxide (N_2O), O_3, and several hydrocarbons (HCs) and chlorofluorocarbons (CFCs). Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth's surface. A gas's global warming potential provides a relative basis for calculating its carbon dioxide equivalent (CO_2e), which is a metric measure used to compare the emissions from various GHGs based upon their global warming potential. CO_2 has a global warming potential of 1, and is therefore the standard to which all other GHGs are measured.

Water vapor is a naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO_2 is the second-most abundant GHG. Uncontrolled CO_2 emissions from power plants, heating sources, and mobile sources are a function of the power rating of each source, the feedstock (fuel) consumed, and the source's net efficiency at converting the energy in the feedstock into other useful forms of energy (e.g., electricity, heat, and kinetic). Because CO_2 and the other GHGs are relatively stable in the atmosphere and essentially uniformly mixed throughout the troposphere and stratosphere, the climatic impact of these emissions does not depend upon the source location on the earth (i.e., regional climatic impacts/changes are a function of global emissions).

3.4.6.1 Regulatory Climate

There have been no significant environmental regulations enacted in the United States at the national level to specifically address increasing concentrations of GHGs or climate change. In April 2007, the U.S. Supreme Court determined that USEPA has the regulatory authority to list GHGs as pollutants under the Federal Clean Air Act. USEPA sought comments from the public and other Federal agencies, but has not yet proposed or adopted any regulations pertaining to GHGs. Numerous proposals and bills have been circulated and have been considered in the U.S. Congress to regulate GHGs, but no legislation has been adopted.

Currently, Federal agencies address emissions of GHGs by reporting and meeting reductions mandated in laws, EOs, and policies. The most recent of these are EO 13514 Federal Leadership in Environmental, Energy, and Economic Performance of 5 October 2009 and EO 13423 Strengthening Federal Environmental, Energy, and Transportation Management of 26 January 2007.

The EPAct, EISA 2007, and EOs 13514 and 13423 require the installation to adhere to specific energy improvements, which address waste reduction and improvements in efficiency. Specifically, the DoD Strategic Sustainability Performance Plan contains strategies to reduce energy waste and improve efficiency. GHGs for the proposed actions would be reduced by incorporating LEED® Silver standards, design standards for military construction projects for FY 2013 and beyond. This plan requires that sources of renewable energy be used by Navy projects, if it can be done within programmed costs, which would aid in achieving a LEED® Silver rating.

3.4.6.2 Baseline GHG Emissions at NSA Bethesda

GHG emission sources at NSA Bethesda include boilers, chillers, water heaters, daily commuters, and emergency generators. Currently, NSA Bethesda monitors GHG emissions for CO_2, CH_4, and NOx for all stationary sources. Table 3-8 provides total GHG emissions from 2010.

Table 3-8: GHG Emissions at NSA Bethesda (2010)

Year	CO_2 (Tons)	Methane (Tons)	NO_x (Tons)
2010	32,544.28	0.59	0.55

Source: NSAB, 2010b.

3.5 Noise

Noise is generally perceived as unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. It may consist of intermittent or continuous sources. Noise can be nondescript, involving a broad range of sound sources and frequencies, or it can have a specific, clearly identifiable sound source. The characteristics of sound include such physical parameters as intensity, frequency, and duration.

The Noise Control Act of 1972 was enacted to establish noise control standards and to regulate noise emissions from commercial products such as transportation and construction equipment. In 1981, USEPA concluded that noise issues were best handled at the state or local government level, and in the early 1980s the primary responsibility of regulating noise was transferred to state and local governments. However, the Noise Control Act of 1972 and the Quiet Communities Act of 1978 remain in effect today.

The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum. A 3-dB increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear.

Noise levels vary continuously with time and various measurable descriptions of noise are used to account for this variance with time. Leq is the average mean square sound level measured in decibels over a time period of consideration, usually 1 hour. L_{10}, L_{50}, and L_{90} are sound

pressure levels that are exceeded 10, 50, and 90 percent of the time, respectively, while L_{MIN} and L_{MAX}, represent the minimum and maximum sound pressure levels recorded during the monitoring period.

According to their regulatory setting, many Federal agencies have developed their own standards, which are often used to determine acceptable noise levels. For example, USEPA has established both indoor and outdoor levels that aim to protect public health and welfare by taking into account levels that would prevent hearing damage, sleep disturbance, and communication disruption. An outdoor limit of 55 dB and an indoor limit of 45 dB would protect against speech interference and sleep disturbance for residential, educational, and health care areas, which are considered noise sensitive receptors.

The sensitivity of the human ear to sound depends on the frequency or pitch of the sound. People hear some frequencies better than others. If a person hears two sounds of the same sound pressure but different frequencies, one sound may appear louder than the other. This occurs because people hear high frequency noise much better than low frequency noise. A-weighting of noise levels provides a standard for noise measurement that takes into consideration the human ear's sensitivity to different frequencies. The Occupational Safety and Health Administration developed a noise exposure standard in the workplace of 90 dBA for the duration of an 8-hour period, with a maximum of 140 dBA for impulsive noise, such as a siren. The Navy has set a noise standard of 84 dBA for 8 hours of constant noise (Navy, 2005[OPNAVINST 5100.23G]).

Traffic noise impact criteria have been established by the Federal Highway Administration (USDOT, 1995). Impacts are expected to occur if the peak hour Leq exterior noise level exceeds 67 dBA for activity areas such as residences, schools, churches, libraries, hospitals, hotels, motels, parks, playgrounds, and recreation areas, or if there is an increase of 5 dBA or more. Other Federal agencies define noise criteria in terms of Ldn (FICUN, 1980).

Maryland state noise level criteria are given in the Code of Maryland Regulations (COMAR) 26.02.03.03, Control of Noise Pollution, and Montgomery County criteria are in the Montgomery County Noise Ordinance. Although the Montgomery County Noise Ordinance is only applicable outside the NSA Bethesda fence line, it is used in the EIS as a proxy to evaluate the impacts of construction noise at receptors located on the installation. The state and county have the same daytime and nighttime noise criteria, but apply them to different day and night hour intervals. The maximum allowable noise levels for the state and county are shown in Table 3-9.

Table 3-9: Maximum Allowable Noise Levels (dBA) for Receiving Noise Areas

	Daytime	Nighttime
Commercial	67 dBA	62 dBA
Residential	65 dBA	55 dBA

Sources: COMAR 26.02.03.03, Control of Noise Pollution. Montgomery County criteria are in the Montgomery County Noise Ordinance.

Maryland regulations define daytime hours as the period between 7 AM and 10 PM. A person may not cause or permit noise levels emanating from construction or demolition site activities that exceed:

(a) 90 dBA during daytime hours

(b) The levels specified for nighttime hours

The Montgomery County ordinance defines daytime as the period between 7 AM and 9 PM on weekdays, and 9 AM and 9 PM on weekends. According to its Noise Level and Noise Disturbance Standards for Construction, the maximum allowable noise levels for construction from 7 AM to 5 PM on weekdays are:

(a) 75 dBA if the Department (Montgomery County Department of Environmental Protection) had not approved a noise-suppression plan for the activity

(b) 85 dBA if the Department has approved a noise-suppression plan for the activity

For all other times the maximum levels listed above for commercial and residential land uses are applicable. The Ordinance also requires construction noise levels be measured at the location, at least 50 feet from the source, on a receiving property where noise from the source is greatest.

3.5.1 General Noise Conditions at NSA Bethesda

Most of the northern, eastern, and southern perimeter of NSA Bethesda is lined with deciduous trees and shrubs with some evergreen trees as well. Some areas, especially in the eastern portion of the installation, have a well-developed understory of vegetation. As such, noise emanating from NSA Bethesda is attenuated to some degree, depending on the density of the vegetation and time of year.

Noise sensitive locations at NSA Bethesda and in the immediate vicinity most likely to be affected by the proposed actions were identified based on land use, analysis of aerial photographs, and field reconnaissance. Noise sensitive receptors adjacent to the installation consist primarily of residences, outdoor recreation facilities, and a school. Land use south of Jones Bridge Road (the southern installation boundary) consists of residential uses to the west and a golf course to the east. Residences are located along the southern portion of the eastern boundary of NSA Bethesda. Forested land is located along the northern portion of the eastern boundary.

Along the northern boundary are residences at the eastern end and a school at the western end. West of the installation, across Rockville Pike, are institutional uses including medical facilities, the Medical Center Metro station, and open space.

3.5.2 Noise Monitoring Methodology

Noise monitoring was conducted at eight locations within NSA Bethesda to identify existing noise levels (Figure 3-5). Although the monitoring sites were all within NSA Bethesda boundaries, measurements from these sites are representative of ambient noise at receptors located outside the installation boundaries because the measurements were taken at the boundary line near the off-installation receptors. The eight locations were selected to establish existing conditions at sensitive receptors that could be affected by the project. The monitoring sites and the recorded measurements are described below. Because of the distance (600 feet) and intervening land use and land cover (major highway) between the sites proposed for project elements and receptors located to the west of the installation, no locations along the western boundary of the installation were selected for ambient noise measurements.

Short-term (20 minute) measurements were conducted at all eight sites during the weekdays of November 2 and 3, 2011. Streets and other impervious surfaces were dry, and little or no wind was experienced during the measurements. During all measurements, parameters recorded consisted of the Leq, L10, L50, L90, L_{MIN}, and L_{MAX}.

Existing A-weighted noise levels were monitored in general accordance with procedures outlined in the Federal Highway Administration's *Measurement of Highway-Related Noise: Final Report* (FHWA-PD-96-046). A Bruel & Kjaer 2236 sound level meter (SLM) was used for field measurement. The meter meets or exceeds the requirements set forth in the ANSI S1.4-1983 Standards for Type 1 and 2 quality and accuracy. An acoustical calibrator (Bruel & Kjaer 4231) was used to calibrate the SLM every 2 hours during the duration of the measurement effort.

The SLM was operated on the A-weighting network and slow-meter response, as recommended by the Federal Highway Administration. A porous windscreen was used on the SLM during all measurement periods. All of the measurements were taken by mounting the SLMs approximately 5 feet above the ground surface at each receptor, which is generally considered representative of the ear level of an average person. Wherever possible, measurement sites were located in open areas away from buildings or other potentially reflective surfaces, in areas that were representative of the outdoor use area of a given receptor.

During the noise measurements, Field Noise Monitoring Sheets were completed, which noted variables such as site surface, pavement type, nearby landmark, distance to landmark, lane direction, grade difference (if any), temperature, wind speed, and any dominant, unusual, or uncharacteristic noise sources during the measurement

(e.g., dogs barking, emergency vehicle sirens, truck idling, and aircraft flyover). These notes also included a sketch of the measurement site.

3.5.3 Existing Noise Levels

Noise levels were measured at eight locations indicated on Figure 3-5 around the perimeter of NSA Bethesda. The eight locations and the ambient conditions during the measurement periods are described below.

1 - North of Jones Bridge Road Residences

The monitoring site north of the Jones Bridge Road Residences was located along the southern perimeter of the installation, northeast of the intersection of Jones Bridge Road and Gunnell Road. The meter was situated with a clear line-of-sight to both Jones Bridge Road, approximately 80 feet to the south, and Gunnell Road, approximately 30 feet to the west. Wind velocity was less than 5 miles per hour (mph). Building construction was in progress at a site approximately 250 feet west of the meter location; however, the minimal construction activity at the time did not generate significant levels of noise. A residential area is located to the south of the monitoring site, across Jones Bridge Road, and a forest is located to the east of this monitoring site.

The major contribution to noise experienced during the measurement came from vehicle traffic on Jones Bridge Road, and from traffic on Gunnell Road. Delivery trucks accessed the installation via the gate at this intersection (Gate 3), stopping to pass through security screening. Table 3-10 provides noise levels recorded during a 20-minute period starting at 1:27 PM.

2 - Navy Lodge

The Navy Lodge monitoring site was located along the southern perimeter of NSA Bethesda on a grass strip between the parking lot for the Navy Lodge and Jones Bridge Road. The meter was situated in a sparse stand of trees approximately 25 feet from Jones Bridge Road, with a clear line-of-sight to the roadway. Grier Road, leading into the installation, is located approximately 150 feet east of this monitoring location. A golf course is located to the south of this location, across Jones Bridge Road, and a strip of land is situated to the east and west of the monitoring location, between the parking lot and the roadway.

For the duration of the measurement, there was little or no wind. The dominant noise source at the time of the measurement was traffic along Jones Bridge Road. Approximately 14 minutes into the measurement a helicopter flew overhead, adding to the noise produced by traffic along the road. Table 3-10 provides noise levels recorded during a 20-minute period starting at 2:10 PM.

Figure 3-5: Monitoring Sites - Existing Noise Levels

Table 3-10: Sound Pressure Levels

Monitoring Site	L_{eq}	L_{Min}	L_{Max}	L_{90}	L_{50}	L_{10}
North of Jones Bridge Residences	64.6 dBA	56.3 dBA	78.0 dBA	60.0 dBA	63.0 dBA	67.5 dBA
Navy Lodge	65.3 dBA	49.4 dBA	77.8 dBA	56.6 dBA	63.0 dBA	68.0 dBA
West of Hawkins Lane	70.2 dBA	47.8 dBA	93.7 dBA*	58.5 dBA	66.5 dBA	70.0 dBA
Warehouse	59.2 dBA	53.3 dBA	71.9 dBA	54.5 dBA	55.5 dBA	61.5 dBA
Stone Ridge West	58.1 dBA	50.8 dBA	76.2 dBA	52.0 dBA	53.5 dBA	56.5 dBA
Stone Ridge East	56.0 dBA	50.5 dBA	71.5 dBA	52.0 dBA	54.0 dBA	57.0 dBA
Flag Housing	59.7 dBA	46.8 dBA	81.2 dBA*	48.5 dBA	52.0 dBA	58.0 dBA
Hospital Courtyard	56.6 dBA	52.4 dBA	66.2 dBA	54.0 dBA	56.0 dBA	58.0 dBA

Source: LBG, 2011b.
* Helicopter fly-over during the measurements at these locations.

3 - West of Hawkins Lane

The Hawkins Lane monitoring site was located at the southeast corner of NSA Bethesda near the intersection of Hawkins Lane and Jones Bridge Road. The meter was situated on a grassy area approximately 35 feet north of Jones Bridge Road and 50 feet west of Hawkins Lane. A few trees are scattered near the monitoring location. Residences are located east of the monitoring location along Hawkins Lane, and a golf course is located to the south, across Jones Bridge Road. Perimeter Road is west of the monitoring station and a stand of scattered trees is located to the north of the monitoring station.

For the duration of the measurement there was little or no wind. The dominant noise source at the time of the measurement was traffic along Jones Bridge Road. At the time of the measurement, South Palmer Road was closed and was not used. A helicopter fly-over occurred during the monitoring session, as indicated in the high L_{MAX} in Table 3-10. Table 3-10 provides noise levels recorded during a 20-minute period starting at 2:50 PM.

4 - Warehouse Site

The warehouse monitoring site was located on at the northeast corner of NSA Bethesda atop a grassy hill approximately 100 feet south of the installation’s perimeter fence. Three warehouse buildings are located approximately 150 feet northeast of this site, and beyond the warehouses is I-495. A parking lot is located south of the monitoring location and a stormwater detention pond is to the southwest. A line of trees separates this location from the residences across the perimeter fence to the north.

For the duration of the measurement there was little or no wind. The dominant noise source at the time of the measurement was traffic along I-495. Occasionally, an automobile parked in the nearby lot was started and driven away, and sound pressure from a helicopter flyover

was recorded. Table 3-10 provides noise levels recorded during a 20-minute period starting at 3:37 PM.

5 - Stone Ridge West

The Stone Ridge West monitoring site was located along the northern border of NSA Bethesda, approximately 20 feet south of the perimeter fence in the area of the Stone Ridge School. North Palmer Road /North Wood Road is located approximately 375 feet south of the Stone Ridge West monitoring site. The monitor was situated on a level grassy area approximately 50 feet east of the large parking lot in the northwest corner of the installation. A thin line of trees is situated along the perimeter fence in this area, and two Stone Ridge School buildings abut the property line. An asphalt drive is situated between the two school buildings.

For the duration of the measurement there was little or no wind. The dominant noise source at the time of the measurement was indeterminate, although traffic noise was audible along North Palmer Road/North Wood Road. Little or no noise was audible from automobile activity in the parking lot. Table 3-10 provides noise levels recorded during a 20-minute period starting at 10 AM.

6 - Stone Ridge East

The Stone Ridge East monitoring site was located approximately 5 feet south of the perimeter fence in a sparse stand of trees situated between a Stone Ridge School athletic field and the newly constructed NSA Bethesda facilities (Building 62) north of Bates Road. A residential community is located directly northeast of the Stone Ridge East site and older NSA Bethesda facilities are southwest of the site.

There was little or no wind for the duration of the measurement. The dominant noise source at the time of the measurement was indeterminate, although a class at the school was being conducted at the time and noise from the class was audible. Little or no noise was audible from activity at either NSA Bethesda facilities. Table 3-10 provides noise levels recorded during a 20-minute period starting at 10:30 AM.

7- Flag Housing

The Flag Housing monitoring site was located approximately 6 feet south of the perimeter fence in the grass-covered back yard of one of NSA Bethesda flag houses situated on Van Reypen Road. The residence is located approximately 100 feet south of the Flag Housing monitoring site, beyond which is Van Reypen Road. Although the immediate area of the site is level, elevations dropped steeply to the west and abruptly to the north. A line of trees separates the site from the residential community to the north and a stand of bamboo is located to the west of the site.

For the duration of the measurement there was little or no wind. The dominant noise source at the time of the measurement was indeterminate. Little or no noise was audible from to traffic along Van Reypen Road or from activity at either NSA Bethesda residence or the residences located north of the property line. A helicopter fly-over occurred during the monitoring session, as indicated in the high L_{MAX} in Table 3-10. Table 3-10 shows noise levels recorded during a 20-minute period starting at 10:58 AM.

8 - Hospital Courtyard

The Hospital Courtyard monitoring site was located in the courtyard which is located west of Building 8 and north of Building 4. The courtyard, approximately 120 feet in length on the north/south axis and 150 feet in length on the east/west axis, is enclosed by multi-story buildings on the north, east, and west sides while the south side is partially enclosed. The surface is composed of masonry honeycomb paving stones that allow approximately half the area to support grass.

For the duration of the measurement there was little or no wind. The dominant noise source at the time of the measurement was construction activity occurring south and west of Building 1. Little or no noise was audible due to traffic. Table 3-10 shows noise levels recorded during a 20-minute period starting at 12:01 PM.

With the exception of one monitoring location, existing sound pressure levels (Table 3-10) do not exceed the adopted maximum daytime noise levels. Existing daytime noise levels adjacent to Jones Bridge Road and west of Hawkins Lane did exceed the daytime levels more than 50 percent of the 20-minute monitoring period. The predominant noise source at this location was traffic moving along Jones Bridge Road. The measurement was also influenced by a helicopter fly-over, possibly skewing the normal noise levels.

3.6 Utility/Infrastructure

3.6.1 Telecommunications

NSA Bethesda has a Nortel CS1000M Private Branch Exchange (PBX) with a Nortel CallPilot voice mail system. Verizon provides service to the PBX via twenty T-1 circuits; 6,000 ports are currently in use and the PBX has the capacity of 10,000 ports (NAVFAC, 2011d). The installation phone service is run on copper frames and the main telecommunication equipment is furnished by Nortel.

Data, alarm, and voice communication lines run throughout NSA Bethesda in an underground duct bank and manhole system. The Medical Center’s data systems are managed at a central location.

3.6.2 Electrical

PEPCO supplies electric power to NSA Bethesda via four high-voltage (3-phase, 13.8 kilovolts [kV]) feeders from its Woodmont substation 80 located due west of the installation on Wisconsin Avenue. PEPCO service enters the installation via an underground duct bank, located north of the South Wood Road and Rockville Pike intersection that terminates into a metering switchgear in Vault 243 (between Buildings 1 and 9). Each PEPCO feeder to the site is capable of delivering at least 8.5 MVA of power for a total normal capacity of 35 MVA. However, the fourth feeder is for redundancy and is only used when one of the other three feeders is out of service. This allows for 31.5 MVA firm capacity demand to be delivered to the site while retaining one feeder for redundancy (Pers. Comm., Padgett, 2011). Firm capacity is the available service from PEPCO for three feeders in an emergency situation.

New metering switchgear was installed in Vault 243 ahead of the existing metering switchgear in August 2010 so the existing switchgear only acts as a primary distribution switchgear to the rest of the installation and no longer provides utility metering. The new switchgear provides 13.8 kV to the new BRAC Buildings 9A and 19, as well as the primary distribution switchgear. The primary distribution switchgear has four 1,200 ampere (A) buses, sections 1 through 4. The new metering switchgear has four 2,000 A buses, sections 5 through 8, that are connected in a ring via normally closed tie breakers. The four main breakers in the new metering switchgear are sized and installed to be able to connect to parallel PEPCO feeders (NAVFAC, 2011f).

PEPCO also provides two 13.2 kV feeders from its NIH Substation 167 to the USU Complex. The USU switchgear serves both the USU and AFRRI complexes. These two feeders are interconnected to two of the Vault 243 bus sections via normally open tie breakers. Because these feeders come from a different PEPCO substation, they can only be closed by PEPCO personnel. Therefore, they are not available under normal conditions to supply loads to the remainder of NSA Bethesda (NAVFAC, 2011z).

WRNMMC medium voltage switchgear distributes power via 15 kV feeders through duct banks and manholes to 15 kV sectionalizing switches, load switches, and substations located throughout the installation. Most of the distribution system operates as a primary selective system with several loops. Air insulated switches provide a means to disconnect the transformers and to select between distribution feeders.

The central plant (Building 16) is provided with four 13.8 kV feeders. Each feeder originates from a different bus section of the 15 kV primary redistribution switchgear in Vault 243 (NAVFAC, 2011l).

3.6.3 Natural Gas

Washington Gas supplies and distributes natural gas to the installation. A dedicated 8-inch, 50 pound per square inch (psi) line serves the boilers in the central plant (Building 16). This line enters the installation from Rockville Pike. The 8-inch line has interruptible service and carries a majority of the overall gas load for the installation. The central plant boilers are duel fuel and can operate on either natural gas or fuel oil. Fuel oil serves as the backup in the event that Washington Gas needs to interrupt service on the 8-inch line due to high peak winter demands. A 6-inch, 20 psi line also enters the installation from Rockville Pike, north of the 8-inch line, and serves numerous buildings on the western portion of the installation. The 6- and 8-inch lines are fed from two different Washington Gas regulator stations. Two additional small-diameter, low-pressure lines enter the installation from the north and south and serve the housing units on Van Reypen Drive (Buildings 34 through 38) and the CDC (Building 26), respectively (NAVFAC, 2011d).

There are approximately five buildings at the installation that use individual gas furnaces for heat and/or hot water, while the remaining buildings are provided with heat/hot water from the central plant. Other buildings with direct gas connections utilize natural gas for kitchen services, laundry, and laboratory functions.

According to information provided by Naval Facilities Engineering Command (NAVFAC), the installation demand averages approximately 4,475,801 therms annually (Pers. Comm., Sadlon, 2012a).

The Navy is coordinating with Washington Gas to ensure that any additional demand does not affect service delivery to the larger community by verifying that the system has capacity to accommodate the increase.

3.6.4 Potable Water

Potable water is supplied to the complex by the Washington Suburban Sanitary Commission (WSSC) through four metered connections. The connections are located at Rockville Pike (part way between the northern and southern intersections of Wood Road), Building 26 (CDC), the Naval Exchange, and Jones Bridge Road (near USU). Each connection has a dual metered arrangement. A small meter measures the normal water flow, and a second meter measures high demand flows, such as fire flows (NSAB, 2012).

WSSC’s supply lines in the area consist of a 12-inch line within Rockville Pike, a 12-inch line along Jones Bridge Road, and a 10-inch line that traverses the southern portion of the installation from Rockville Pike to Perimeter Road.

WSSC operates and maintains two water filtration plants with a combined treatment capacity of 355 million gallons per day (MGD). The Pawtuxent Plant produces a maximum of 70 MGD; the Potomac Plant was

recently upgraded to produce a maximum of 285 MGD. The average demand on WSSC's system from the 1.8 million residents served is 170 MGD. Source water for the Potomac Plant, which supplies NSA, is drawn from the Potomac River and undergoes treatment including: coagulation and flocculation, sedimentation, filtration, chlorination, lime addition, fluoridation, and ultraviolet disinfection. Potable water supplied by WSSC reportedly meets or exceeds all USEPA standards for safety and quality (WSSC, 2010).

The water distribution system within NSA Bethesda consists of approximately 44,000 linear feet of predominantly ductile iron pipe. Nearly 40 percent of the lines are 10 inches or greater in diameter. Pressure in the system is provided by the direct connections to the WSSC distribution system. NSA Bethesda system pressures are not altered by booster pumping or pressure reduction. Water system pressures under normal operating conditions are reported to be above 40 psi and below 100 psi, which meet NSA Bethesda's service level criteria. NSA Bethesda currently does not have water storage on installation and relies solely on WSSC distribution system to meet all peak and fire flow demands (NSAB, 2012).

Table 3-11 summarizes historical water usage at the installation based on water meter readings. The average daily water use over the last 10 years of available records is approximately 657,000 gallons per day (gpd); however, the annual averages have varied due to changes at the installation (NSAB, 2012).

Table 3-11: Water Consumption History

Year	Annual Average Daily Demand	Annual Average Daily Demand Rate
2010	617,000 gpd	428 gpm
2009	609,000 gpd	422 gpm
2008	550,000 gpd	384 gpm
2007	579,000 gpd	402 gpm
2006	733,000 gpd	509 gpm
2005	802,000 gpd	557 gpm
2004	629,000 gpd	437 gpm
2003	904,000 gpd	628 gpm
2002	531,000 gpd	369 gpm
2001	619,000 gpd	430 gpm
Ten year Average	595,400 gpd	457 gpm
Source: NSAB, 2012.		

3.6.5 Wastewater

Wastewater generated at NSA Bethesda is discharged to the WSSC's collection system for treatment at the District of Columbia's Blue Plains Advanced Wastewater Treatment Plant. NSA Bethesda's portion of the collection system consists of approximately 20,000 linear feet of gravity sewer lines and force mains ranging from 4 to 18 inches in diameter. In addition, NSA Bethesda's system includes 100 service

laterals, 150 manholes, three small pump stations, four exterior grease interceptors, and an oil/water separator.

WSSC's sanitary sewer mains generally run through the center of the installation flowing from southwest to northeast along the Stoney Creek corridor. The onsite WSSC system consists of approximately 13,000 linear feet of gravity sewer lines ranging in size from 8 to 24 inches in diameter and 63 manholes (NSAB, 2012).

The Blue Plains Advanced Wastewater Treatment Plant has a treatment capacity of 370 MGD and a peak wet weather capacity of more than 1 billion gpd. The existing wastewater treatment processes at the Blue Plains Advanced Wastewater Treatment Plant consist of: preliminary and primary treatment; secondary treatment; nitrification/denitrification; effluent filtration; chlorination/dechlorination; and post aeration. Treated water is discharged to the Potomac River (WASA, 2011).

3.6.6 Stormwater

A majority of the stormwater runoff from the installation is collected by a series of inlets and catch basins that convey storm water through a pipe network to Stoney Creek. Stoney Creek flows in a northeast direction across the installation and discharges into Rock Creek, which in turn discharges into the Potomac River. Some surface runoff flows directly into Stoney Creek, and runoff from a few selected areas is directed to onsite stormwater detention basins. The storm drainage system is separate from the sanitary sewer collection system and was designed to accommodate a 10-year storm event (NAVFAC, 2011d).

NAVFAC Washington and NSA Bethesda Environmental Programs Division oversee the stormwater management program for the installation. The installation is covered by two different state stormwater permits. One permit covers stormwater discharges associated with industrial activity (Individual Permit MD0025670) and the second covers all other stormwater discharges associated with municipal activities (General Permit for Discharges from State and Federal Small Municipal Separate Storm Sewer Systems [MS4]). The installation has a Stormwater Pollution Prevention Plan in place and a Stormwater Management Action Plan, which combines both the Industrial and General discharge permit requirements into one comprehensive document (NAVFAC, 2011m).

Projects at NSA Bethesda are required to comply with Maryland Stormwater Management Guidelines for State and Federal Projects (updated 15 April 2010). These guidelines establish minimum stormwater quality standards and maximum stormwater discharges from a given site. Impacted projects include new construction greater than 5,000 SF of disturbed area and redevelopment of existing impervious areas of 5,000 SF or more. The goal of the guidelines is to manage stormwater by using environmental site design to the maximum extent practical to reduce stream channel erosion, siltation, sedimentation, and local flooding. Environmental site design means using small-scale stormwater management practices, nonstructural techniques, and better site

planning to mimic natural hydraulic runoff characteristics and minimize the impact of land development on water resources.

3.6.7 Solid Waste Management

Solid waste generated at the installation is collected and disposed through a contract with a private waste hauler, F&L Construction of Washington, DC. NSA Bethesda has policies and programs in place that address integrated solid waste management, recycling, and green procurement. In general NSA Bethesda policy is to reduce, properly manage, and recycle non-hazardous solid waste and to purchase environmentally preferable products when feasible. NSA Bethesda currently recycles paper, cardboard, aluminum, steel, plastic and glass containers, toner cartridges, cooking oil, motor oil, car/truck batteries, wood pallets, and yard debris (NSAB, 2011a).

Disposal of construction and demolition materials for a specific project are handled by the contractor through the project specifications. Typically, debris is removed from the site and hauled off of the installation by the general provisions of the project specifications and is included in the cost of the project. Hazardous materials associated with demolition are still handled by the contractor, but are disposed of in accordance with applicable Federal and state regulations. The 2011 Solid Waste Report indicates that more than 5,500 tons of construction and demolition waste were recycled this past year (NSAB, 2011a). Solid waste generated in Montgomery County is transported to the Brunswick Waste Management Facility landfill located near Lawrenceville, Virginia.

3.6.8 Steam/Chilled Water Systems

Steam is generated at the central plant (Building 16) for domestic hot water and heating of more than 60 buildings at the installation. Building 16 contains five steam boilers that are each rated to provide 60,000 pounds per hour of steam at 125 psi gauge pressure. The boilers are duel fuel and are capable of burning either natural gas or No. 2 fuel oil. The high-pressure steam distribution system comprises a variety of underground conduits that vary in size from 1.5 to 10 inches in diameter. All condensate returned to the central plant is via pumps located in building mechanical rooms or in manholes at low points in the piping system. The central plant is configured with four condensate transfer pumps that transport condensate from two existing concrete-lined carbon steel condensate surge tanks to two de-aerators. The central plant is also equipped with five boiler feed pumps, which are connected together in a manifold pipe configuration for redundancy. The feed pumps deliver water from the de-aerators to the economizer and boiler drums. Boiler make-up water is introduced into the condensate receiver tanks (NAVFAC, 2011n).

The steam distribution and condensate return system consist of six operational loops:

- Loop #1 serves Buildings 9, 10, 14, 50, 51, 55, and 57.
- Loop #2 serves Buildings 1 through 8, 11, 13, 15, 20, 54, 60, and 61. (This loop has the ability to serve the Buildings in Loop #1 as well.)
- Loop #3 serves Buildings 9A and 19.
- Loop #4 serves Buildings 27, 28, 53, 59, the Roads and Grounds area, and the Wounded Warrior Lodging.
- Loop #5 serves AFRRI and USU.
- Loop #6 is abandoned.
- Loop #7 serves Buildings 17 and 62.

Deteriorating condensate return lines have been identified throughout the installation. NSA Bethesda plans to replace these lines and address other deficiencies identified by the 2011 Steam and Condensate Distribution Study (NAVFAC, 2011n).

Chilled water for air conditioning is also produced at the central plant (Building 16). The central plant currently has nine functioning electric centrifugal chillers and an inoperative duel fuel gas/oil-fired absorption Chiller 1A. Chillers 1 through 8 were manufactured between 1995 and 1999 and each is rated to provide 1,440 tons of cooling when producing 42-degree Fahrenheit chilled water. Chiller 9 was manufactured in 1990 and is rated to provide 1,100 tons of cooling. Currently a minimum of two chillers operate in the winter and a maximum of six chillers operate in the summer. Two chillers are held in reserve to meet the reliability requirements for medical military facilities (NAVFAC, 2011o).

Building 252 supports the operations of the central plant and is located immediately east of Building 16. Building 252 contains a three cell cooling tower, condenser water pumps, fuel oil storage tanks, and fuel oil pumps.

The distribution system for chilled water consists of underground conduit varying in size from 10 to 24 inches in diameter. There are five main chiller loops serving the installation:

- Loop #1 serves Buildings 1 through 10, 14, 50, 54, and 55.
- Loop #2 serves Buildings 11, 60, and 61.
- Loops #3 and #4 serve Buildings 17 and 62.
- Loop #5 serves the 40s series buildings (AFRRI complex), the 70s series buildings (USU Complex), and Buildings 56 and 57.

In 2010, a Chilled Water Distribution Pipeline System Study was performed to determine whether the existing system could support planned expansion. The study identified deficiencies and corrective

measures to improve and expand the system. NSA Bethesda plans to implement these measures as further described in the impacts section.

3.7 Transportation & Traffic

This section discusses the existing study area roadways and installation gates, data gathering techniques, traffic operational analysis methods and results, and comparisons to 2008 traffic forecasts. To ensure the analysis complies with all state and county requirements, agreement was sought from the M-NCPPC, MSHA, and MCDOT on the study area, analysis methods, and future external roadway distribution of new NSA Bethesda trips. The analysis methods agreed upon for the external roadway intersections followed the Montgomery County and MSHA requirements. A separate more commonly accepted traffic analysis method was used for the internal roadway network because these roadways are not under the County or State jurisdiction, but would be reviewed by NCPC. To provide additional traffic operation measurements beyond the MSHA and Montgomery County requirements, this same commonly accepted traffic analysis method was also used to evaluate the external roadways.

The chapter also discusses installation trucking access, pedestrian and bicycle facilities and volumes, and transit availability. Trucking access provides an overview of which route trucks would be required to use when accessing the installation and where they might be destined once inside. In addition to motor vehicle conditions, pedestrian and bicycle facilities and volumes provide a description of the existing pedestrian and bicycle network and the current volume. Transit availability discusses the different transit options connecting the installation facilities to the local neighborhood and regional transit centers. As the installation is in an urban area (less than one mile north of downtown Bethesda), these alternative transportation modes are an important part of the transportation system serving the installation.

3.7.1 External Roadway Conditions

NSA Bethesda is situated just south of the Capital Beltway (I-495) in Bethesda, Maryland. The western and southern boundaries of the installation are formed by Rockville Pike and Jones Bridge Road, respectively. The remaining borders of the installation include various residential, educational, and community uses. The roadway network and external study intersections are shown in Figure 3-6.

NSA Bethesda is a secure site that can only be accessed via five security gates. These gates are shown in Figure 1 and are:

- Gate #1 or North Wood Road Gate (North Gate): Accessed from Rockville Pike.
- Gate #2 or South Wood Road Gate (South Gate): Accessed from Rockville Pike.
- Gate #3 or Gunnell Road Gate: Accessed from Jones Bridge Road.

- Gate #4 or Grier Road Gate: Accessed from Jones Bridge Road.
- Gate #3 or University Road Gate: Accessed from Jones Bridge Road.

The five gates are referred to as Gates #1, #2, #3, #4, and #5 in this EIS.

3.7.1.1 External Roadway Network

The principal roadways in the vicinity of NSA Bethesda include the following:

Rockville Pike (MD 355)

This six-lane divided roadway is classified as a principal arterial by MSHA. An arterial is defined as a roadway serving regional traffic movements and regional land uses (e.g., medical center, shopping center, and research park), traveling between cities, and connecting Interstates or other arterials to local roadways serving local land uses (e.g., residential homes and small businesses). Rockville Pike provides direct access to NSA Bethesda through Gates #1 and #2. It is oriented north-south along the western edge of the installation, connecting the installation with Washington, DC to the south (it is called Wisconsin Avenue south of the installation) and the city of Frederick, Maryland to the north. This roadway also provides connections to other locations throughout Montgomery County and the surrounding metropolitan area via an interchange with the Capital Beltway (I-495) and the Washington National Pike (I-270) to the north. It also provides connections to major east-west arterial roadways along other segments to the north and south of the installation. Rockville Pike is therefore a major regional and commuter route. It is also the main artery for several bus routes operated by the Washington Metropolitan Area Transit Authority (WMATA) and the Montgomery County Ride On transit systems.

Rockville Pike is heavily traveled in the vicinity of NSA Bethesda. Traffic congestion and delays occur in the southbound direction during the morning peak period, with similar conditions occurring in the northbound direction during the evening peak period. Alternating bands of stopped and slowly moving traffic were observed stretching for several intersections in both directions from the installation along the peak direction of travel. These congested conditions are a result of high volumes of commuter traffic heading between suburban residential areas to the north of the installation and the employment centers of Bethesda-Chevy Chase and the District of Columbia to the south.

In response to increased traffic volumes along Rockville Pike, MSHA has proposed a series of improvements throughout this corridor to improve traffic flow. The most noteworthy of these is to widen Rockville Pike in the northbound direction to four lanes between the North Wood Road installation entrance and Locust Hill Road, just north

of Cedar Lane. These improvements are intended to improve traffic capacity at the Cedar Lane intersection, which serves as a primary location for delays.

Improvements are also planned at the intersection of Jones Bridge Road with Rockville Pike, which would widen each leg of the intersection in order to incorporate additional turning and through lanes at each approach. These improvements are intended to improve capacity in this heavily congested area. Fully actuated signals would also be implemented at this location through modifications to the traffic signal's operational scheme. Fully actuated signals would allow the signal to respond to varying traffic patterns in real time by reacting to the shifting ebb and flow of traffic along all intersection approaches, allocating green time based upon traffic demand up to a maximum limit. In this way, the signal would be able to accommodate fluctuations in traffic volume on a cycle-by-cycle (the time for a traffic signal to service each approach) basis.

Capital Beltway (I-495)

The Capital Beltway exists as a circumferential regional interstate facility around Washington, DC. In the vicinity of NSA Bethesda, I-495 runs east-west to the north of the installation with an eight-lane cross section, connecting to I-270 to the northwest and other radial arterials including Rockville Pike, Old Georgetown Road, and Connecticut Avenue in the immediate vicinity of the installation.

Jones Bridge Road

Jones Bridge Road is a four-lane divided arterial roadway, oriented east-west along the southern edge of NSA Bethesda. Jones Bridge Road provides direct access to NSA Bethesda via Gates #3, #4, and #5. The road begins at the NIH campus to the west and continues east to intersect with Connecticut Avenue and has a posted speed limit of 40 mph.

Cedar Lane

Cedar Lane is an undivided arterial roadway that ranges between two and four lanes in width, and is oriented east-west north of NSA Bethesda. Cedar Lane is separated from NSA Bethesda by the Stone Ridge School of the Sacred Heart and therefore does not connect directly to the installation. The posted speed limit is 30 mph.

Future improvements proposed by MSHA include the addition of several turn lanes at the intersection of Cedar Lane and Rockville Pike in order to increase the saturation flow rate at this intersection. By increasing the rate at which vehicles would be able to traverse this intersection from the east and west, more green time could be allocated to the approaches along Rockville Pike. As mentioned previously, the additional through lanes along Rockville Pike would also improve these operations.

Connecticut Avenue (MD 185)

Connecticut Avenue is a six-lane divided roadway and is classified as a major highway (same as an arterial) by Montgomery County. It is oriented north-south just east of NSA Bethesda, and extends from Washington, DC to Aspen Hill, east of Rockville in Montgomery County. Connecticut Avenue has an interchange with I-495 to the northeast of NSA Bethesda. This roadway serves regional and commuter traffic and is traversed by several WMATA and Ride On bus routes. The posted speed limit is 35 mph and in sections is enforced by speed cameras.

Future improvements proposed by MSHA at the intersection of Connecticut Avenue and Jones Bridge Road include widening of both roadways near the intersection in an effort to improve traffic flow and congestion.

Old Georgetown Road (MD 187)

Old Georgetown Road is a four-lane roadway that is classified as a major highway (same as an arterial) by Montgomery County and is oriented north-south to the west of Rockville Pike. Old Georgetown Road extends south from White Flint to downtown Bethesda. This roadway has interchanges with I-270 and I-495 and is traversed by several WMATA and Ride On bus routes. The posted speed limit is 40 mph.

Future improvements proposed by MSHA at the intersection of Old Georgetown Road and West Cedar Lane include the addition or lengthening of turning lanes and the widening of travel lanes, which would improve flow through existing intersections near the NIH campus.

Jones Mill Road

This is a two-lane roadway located east of Connecticut Avenue and is classified as a primary residential street by Montgomery County. Jones Mill Road is oriented primarily north-south between I-495 and the East-West Highway and serves to connect the northern and southern sections of Beach Drive as it travels through Rock Creek Park. The posted speed is 25 mph.

Woodmont Avenue

This roadway has a four-lane cross-section and is classified as an arterial street with a posted speed of 25 mph. Woodmont Avenue is parallel to Rockville Pike northward from downtown Bethesda, remaining one block west of Rockville Pike before finally curving east and intersecting with that roadway one block south of Jones Bridge Road. Woodmont Avenue assists in circulating traffic between NSA Bethesda, the NIH campus, and the downtown Bethesda.

3.7.1.2 External Study Intersections

The Montgomery County LATR Guidelines are set forth to establish a more precise and documented approach for evaluating the potential transportation-related impact for growth throughout Montgomery County, Maryland. Throughout the county, various areas are categorized based on their level of congestion and ability to accept a respective amount of additional development. The LATR assists in determining what additional development can be supported in the area and outlines the steps an applicant must take for determining the associated impact on the transportation network. Because NSA Bethesda is within Montgomery County, it would adhere to the LATR standards.

As part of the LATR evaluation, elements such as development size, trip generation, study area, adequacy of traffic flows, and other criteria are analyzed. One specific step of this evaluation is selecting a study area. As outlined in the LATR, the study area associated with a new or redeveloped parcel is directly related to the total number of new trips the development would add to the transportation network. Based on a scale provided by M-NCPPC, a total number of signalized intersections must be studied for a specific range of generated trips.

For this traffic study, the Navy initiated early coordination with the M-NCPPC, MSHA, and MCDOT to ensure that the agencies were in agreement with the methodology used in the traffic study. The intersections external to NSA Bethesda that were included in the traffic study were identified based on a preliminary site trip assignment through 17 intersections adjacent to the installation, in accordance with the M-NCPPC's LATR methodology. This list was expanded to include additional intersections identified by the public during the scoping period. Based on the site trip assignment and coordination with M-NCPPC, the original 17 intersections were determined to capture the majority of the traffic that would be generated by proposed actions; therefore, the additional intersections were not included (NAVFAC, 2011b and M-NCPPC, 2011a). The external roadway study intersections, shown in detail in Figure 3-6, are:

1. Rockville Pike and Grosvenor Lane
2. Rockville Pike and Pooks Hill Road
3. Old Georgetown Road and Oakmont Ave/Cedar Lane
4. Locust Ave/West Drive and Cedar Lane
5. Rockville Pike and Cedar Lane
6. Rockville Pike and North Drive/School Driveway
7. Rockville Pike and NIH Delivery Entrance/North Wood Road (Gate #1)
8. Rockville Pike and Wilson Drive
9. Rockville Pike and South Drive/South Wood Road (Gate #2)
10. Rockville Pike and Center Drive/Jones Bridge Road

11. Gunnell Road (Gate #3)/Glenbrook Parkway and Jones Bridge Road
12. Grier Road (Gate #4) and Jones Bridge Road
13. University Road (Gate #5) and Jones Bridge Road
14. Connecticut Avenue and Jones Bridge Road and Kensington Parkway
15. Manor Road and Jones Bridge Road
16. Jones Bridge Road and Jones Mill Road
17. Rockville Pike/Wisconsin Avenue and Woodmont Avenue/Glenbrook Parkway

Within the study area, intersections 7, 9, 11, 12, and 13 are the locations of security gates for NSA Bethesda.

3.7.1.3 External Existing Lane Geometry and Traffic Control

As part of the field data collected in the vicinity of NSA Bethesda, a detailed reconnaissance of lane geometry and traffic signal timings was conducted. Several visits were made to NSA Bethesda to ensure that accurate information was collected and available for this report. Based on those field visits, the lane geometry and traffic control were determined and can be found in Appendix D, Figures 3A and 3B.

While the information collected is expected to be the most accurate available, MSHA continues to monitor the corridor and adjust signal timings to optimize the traffic flow. These modifications are not expected to have a significant impact on the phasing or lane use at the external intersections.

3.7.1.4 External Existing Peak Hour Traffic Volumes

Manual turning movement counts were collected at the 17 external intersections shown in Section 3.7.1.2 over the course of 18, 19, 20, and 26 October 2011. These days were selected so that average mid-week (Tuesday through Thursday) data could be collected. Traffic volumes were collected at the 17 external study intersections from 5:30 – 9:00 AM and from 3:00 - 6:30 PM in order to provide a large range of data to properly identify the morning and afternoon peak hours of traffic.

In addition to manual turning movement counts, automatic traffic records were placed at eight locations throughout the study area to obtain 24-hour counts. These counters were placed between October 25th and November 2nd to provide a multiple day count history in 15-minute intervals.

Traffic count data at the 17 external study intersections were tabulated during 15-minute intervals within the AM and PM observational periods. The 1 hour periods associated with the highest volume of traffic during the AM and PM peaks are generally referred to as the peak hours. Based upon the manual turning movement and

automatic traffic record counts, the following conclusions can be drawn from the calculated peak hour data for NSA Bethesda:

- The traffic counts at the external intersections indicate a system peak hour of 7:45 – 8:45 AM in the morning and 4:45 – 5:45 PM in the evening.

- Along Rockville Pike/Wisconsin Avenue, the AM peak hour becomes gradually later as traffic progresses southbound through the study area. This finding shows the peak flow of commuter vehicles traveling southbound, peaking at the northernmost study area intersection between 7:30 – 8:30 AM, adjacent to NSA Bethesda between 7:45 – 8:45 AM, and finally to the south of the installation between 8:00 – 9:00 AM.

- The AM peak hour of traffic outside NSA Bethesda Gates #1, #2, #3, and #4 occurs between 7:30 – 8:30 AM and 8:00 – 9:00 AM at all intersections. Gate #5 experienced its peak hour between 6:30 – 7:30 AM.

- The PM peak hour occurs in a wider range of times across the study area, varying from 3:30 – 4:30 PM to 5:30 – 6:30 PM. However, the PM peak hour generally occurs later in the day on the major north-south commuter route of Rockville Pike/Wisconsin Avenue when compared to the side streets. This is consistent with the tendency for traffic from local area driveways to peak earlier than commuter traffic that must travel some distance to arrive in the study area.

These AM and PM system peak traffic volumes are shown on Figures 3-7 and 3-8 and are utilized to analyze capacity across the study area.

Figure 3-6: External Study Intersections

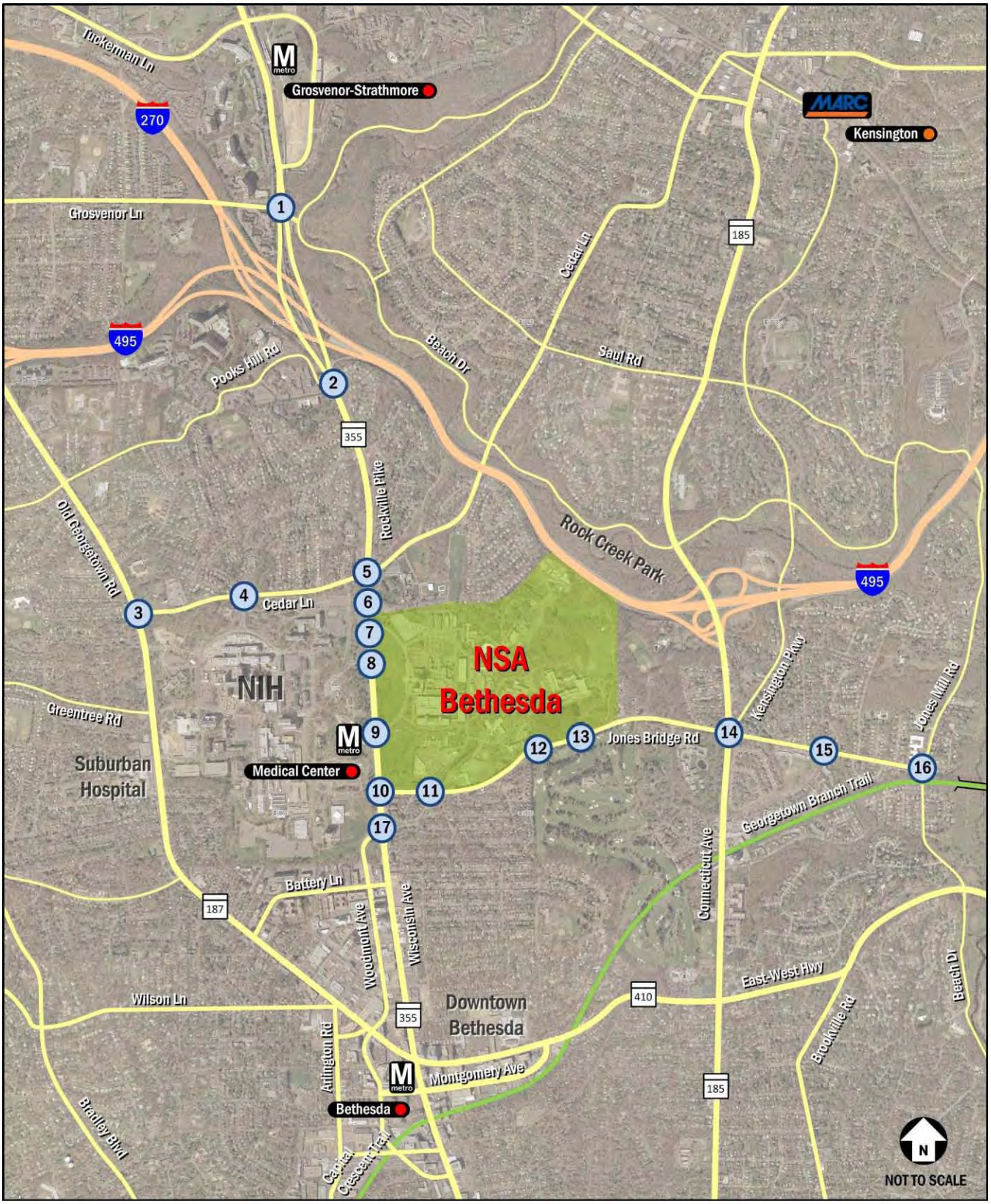


Figure 3-7: External Traffic Volumes - Existing (2011) Conditions

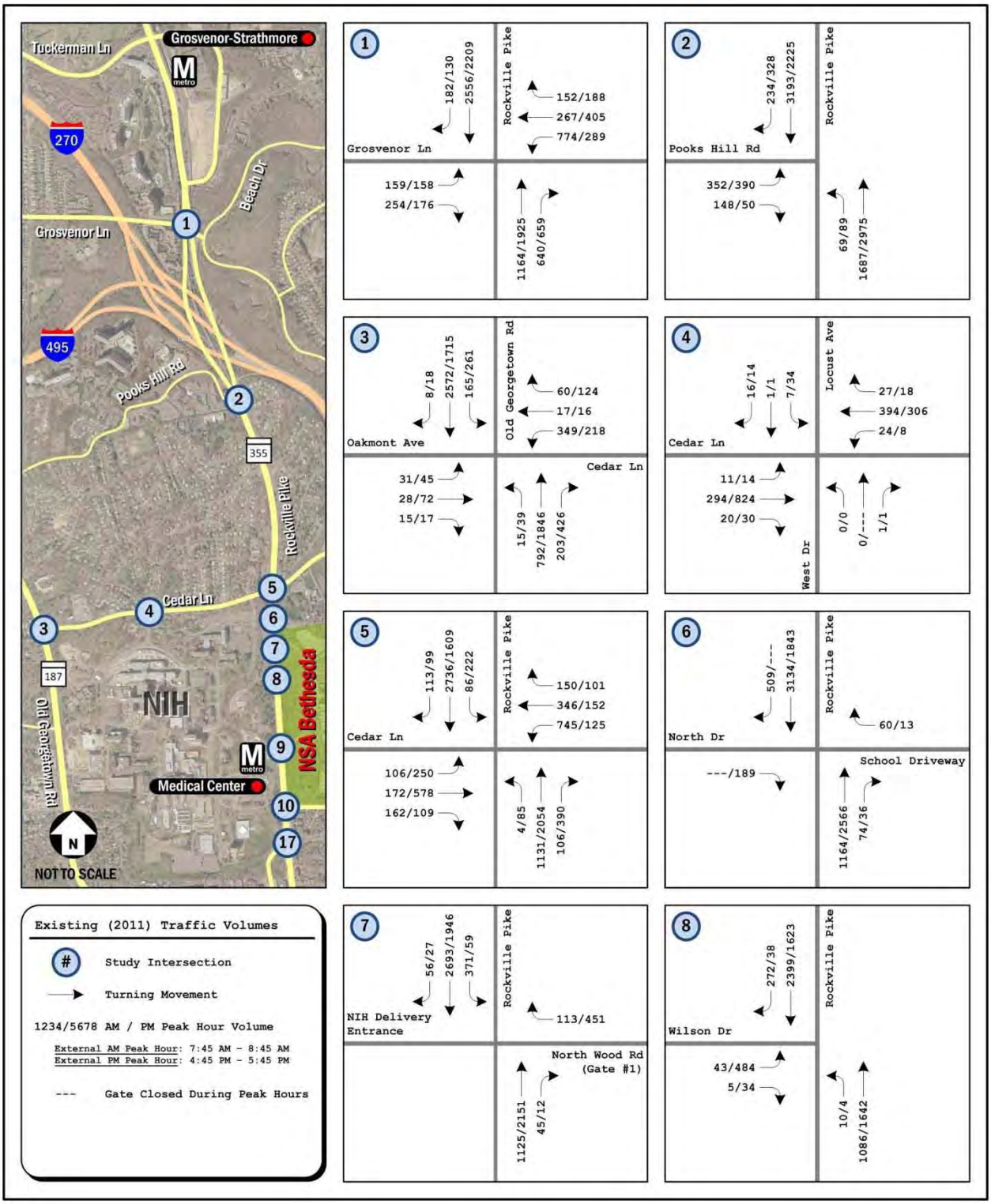
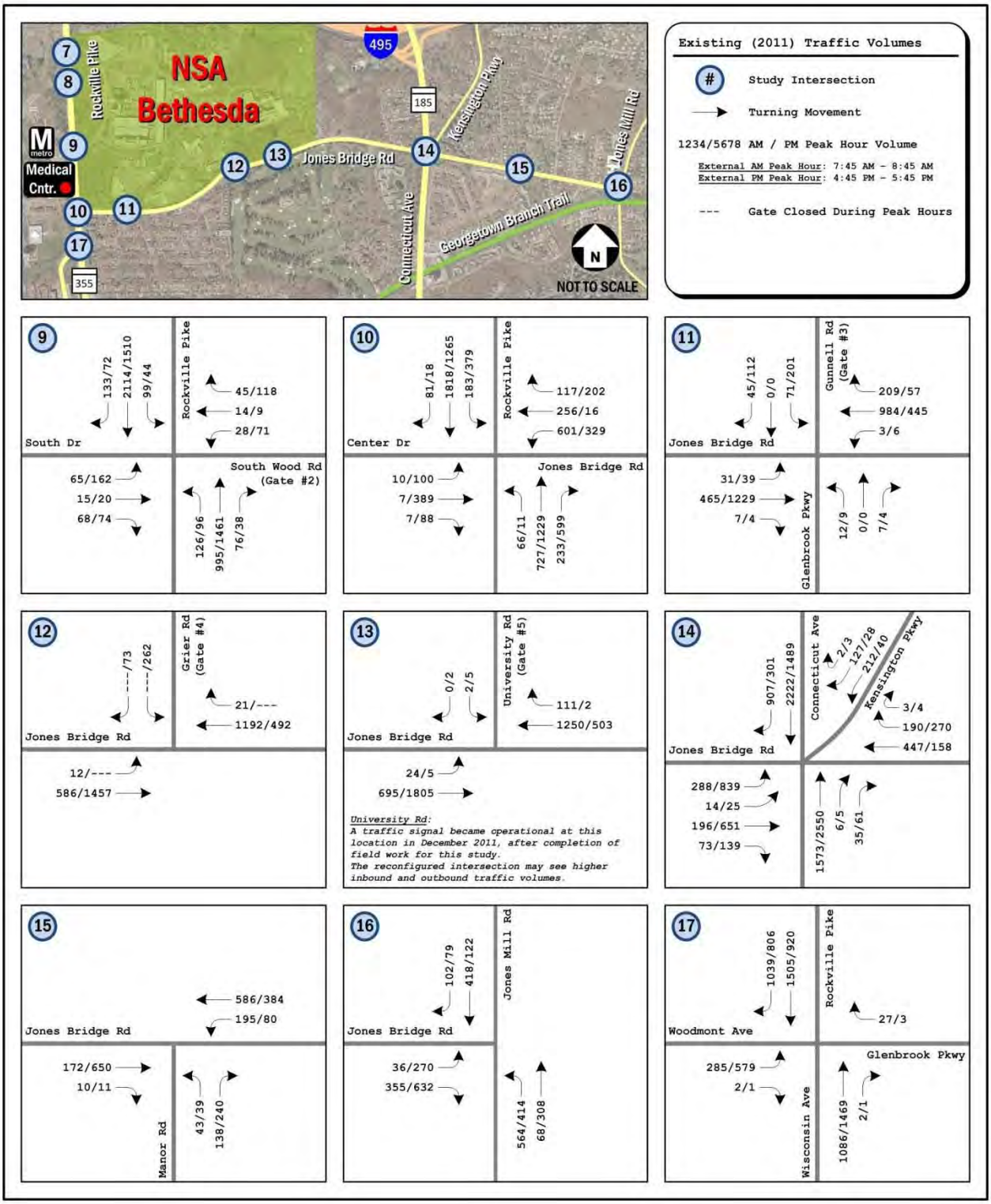


Figure 3-8: External Traffic Volumes - Existing (2011) Conditions



3.7.1.5 External Existing Capacity Analysis

A capacity analysis is a way of assessing the performance of an intersection or a network of intersections based on the observed traffic volumes, lane geometry, and intersection operation. By comparing these field-measured characteristics to established baselines using equations and tables published in industry-standard reference guides, an intersection can be graded based on its calculated LOS as indicated by a letter grade of A through F.

M-NCPPC's LATR specifies the use of the Critical Lane Volume (CLV) traffic analysis method in conducting vehicle capacity analyses within Montgomery County. While the LATR indicates that unsignalized intersections should also use the CLV method, the Highway Capacity Manual (HCM) provides a much more accurate measure for determining the operations of stop-controlled intersections.

Critical Lane Volume Method

Capacity analyses for each of the signalized intersections for the external network were conducted following the CLV method established by M-NCPPC LATR guidelines. The CLV method, as established by the HCM, is a basis for calculating the peak hour vehicular capacity of an individual intersection on the basis of its lane configuration and phasing, without incurring bias from adjacent intersections. Similar to other means of calculating intersection capacity, the intersection capacity results are expressed in terms of the LOS, which is indicated by a letter grade of A through F.

LATR guidelines define a specific congestion standard that determines the associated threshold for each LOS letter grade based on criteria for the specific policy area within Montgomery County. This congestion standard represents the sum of critical lane volumes that the intersection can theoretically handle while remaining within the tolerable limits of delay that exist in a given policy area. In the area associated with NSA Bethesda, each study intersection in the network is associated with the LATR defined Bethesda policy area, which establishes a CLV standard of 1,600 for LOS F. The only study intersection outside this policy area is the intersection of Rockville Pike and Grosvenor Lane, which is in the North Bethesda policy area and has a CLV standard of 1,550.

Given this criteria and the CLV method provided in the LATR, capacity analyses were conducted for each of the signalized intersections within the study area. The CLV results for each of the signalized intersections can be found in Table 3-12. According to the HCM when using the level of service (LOS) ratings, a LOS of D or better represents stable traffic operations, while a LOS of E or F represents unstable traffic operations with significant delays.

Table 3-12: NSA Bethesda External LOS Results (CLV Method)

	AM Peak Hour		PM Peak Hour		M-NCPPC Threshold	
	CLV	LOS	CLV	LOS	StandaRoac	Pass/Fail
1. Rockville Pike & Grosvenor Lane	1,356	D	1,306	D	1,550	Pass
2. Rockville Pike & Pooks Hill Road	1,283	C	1,308	D	1,600	Pass
3. Old Georgetown Road & Oakmont Ave/Cedar Lane	1,396	D	1,459	E	1,600	Pass
4. Locust Ave/West Drive & Cedar Lane	480	A	919	A	1,600	Pass
5. Rockville Pike & Cedar Lane	1,748	F	1,613	F	1,600	Fail AM+PM
6. Rockville Pike & North Drive/School Dwy	*unsignalized*		*unsignalized*		1,600	Pass
7. Rockville Pike & North Wood Road (Gate #1)	804	A	967	A	1,600	Pass
8. Rockville Pike & Wilson Drive	1,023	B	894	A	1,600	Pass
9. Rockville Pike & South Drive/South Wood Road (Gate #2)	1,081	B	970	A	1,600	Pass
10. Rockville Pike & Center Drive/Jones Bridge Road	1,098	B	1,287	C	1,600	Pass
11. Gunnell Road (Gate #3)/Glenbrook Pkwy & Jones Bridge Road	798	A	1,040	B	1,600	Pass
12. Grier Road (Gate #4) & Jones Bridge Road	644	A	1,034	B	1,600	Pass
13. University Road (Gate #5) & Jones Bridge Road	*unsignalized*		*unsignalized*		1,600	Pass
14. Connecticut Avenue & Jones Bridge Road & Kensington Pkwy	1,431	D	1,626	F	1,600	Fail PM
15. Manor Road & Jones Bridge Road	724	A	970	A	1,600	Pass
16. Jones Bridge Road & Jones Mill Road	1,018	B	1,024	B	1,600	Pass
17. Rockville Pike/Wisconsin Avenue & Woodmont Ave	708	A	851	A	1,600	Pass

The existing traffic capacity analysis shown above indicates three intersections operate with a critical lane traffic volume at or above acceptable M-NCPPC threshold limits during at least some portion of the day. These three intersections are:

- Intersection #3, Old Georgetown Road & Oakmont Avenue/Cedar Lane during the PM peak hour (LOS E)
- Intersection #5, Rockville Pike & Cedar Lane during both the AM (LOS F) and PM peak hours (LOS F)
- Intersection #14, Connecticut Avenue & Jones Bridge Road & Kensington Parkway during the PM peak hour (LOS F)

The remaining study area signalized intersections currently operate at an acceptable LOS during both the AM and PM peak periods. While the three intersections listed above operate at levels beyond the acceptable range, it is acknowledged that several of the intersections along Rockville Pike experience significant delay due to heavy congestion in the area and that as a result, traffic progression is compromised. Field observations of congestion conditions during both peak periods are discussed in a subsequent section.

Highway Capacity Manual Methods Using Synchro Traffic Analysis

While the CLV method provides procedures for determining the LOS of signalized intersections as required by the LATR, the HCM method provides a secondary signalized intersection analysis. Since the HCM method provides a more accurate analysis for unsignalized intersections, especially unsignalized intersections with stop signs posted on only the minor approaches, the procedures put forth in the HCM were used as a primary analysis method to complete the unsignalized capacity analysis.

The HCM method includes additional input factors such as lane width, truck percentage, pedestrian conflicts, and roadway grade in its calculation of the delay present at each intersection and also includes a progression factor to account for the interaction of adjacent intersections, so that the impacts of signalized progression along the Rockville Pike and Jones Bridge Road corridors can be better assessed. In this way, the HCM method is able to evaluate the capacity conditions across the entire network instead of individual intersections.

As with the CLV method, HCM techniques also express LOS conditions in terms of the letter grades A through F. However, instead of basing the LOS grade on the sum of the critical lane volumes across the entire intersection, results are then expressed as a LOS based on the delay experienced by an average vehicle at the intersection. The Synchro Traffic Analysis Software, which uses the HCM method, was used to calculate the results for the entire external network. As mentioned above, the HCM method is used as a primary analysis method to assess the capacity of the unsignalized intersections, specifically the #6, Rockville Pike and North Drive/School Driveway, and #13, Jones Bridge Road & University Road. For all others these results are only shown by way of comparison to the CLV results.

Based on the HCM analysis, the #6, Rockville Pike and North Drive/School Driveway intersection is operating at a LOS of A during the AM peak hour and a LOS of B during the PM peak hour for the minor approaches. Rockville Pike flows freely through this two-way stop controlled intersection and does not have a LOS assigned. The #13, Jones Bridge Road and University Road intersection is failing in the southbound direction during the AM peak and the same approach has a LOS of C during the PM peak hour, as two-way stop controlled intersections do not have an overall LOS.

3.7.1.6 External Roadway Operational Conditions

The capacity analysis results presented in Section 3.7.1.5 provide an indication of heavy volumes resulting in congestion; however, they do not reflect the full extent of this congestion and the resulting queuing that occurs along NSA Bethesda’s frontage.

High vehicular volumes were observed traveling southbound in the morning and northbound in the evening along major north-south roadways like Rockville Pike/Wisconsin Avenue, Connecticut Avenue, and Old Georgetown Road. These measurements are supported by field observations and match well with the expected commuter travel patterns in this portion of Montgomery County. However, because of high volumes in the peak direction and the lengthy distances between traffic signals along these roadways, traffic is able to disperse between the intersections. When peak direction traffic is more spread out, it becomes difficult to coordinate the traffic signals. As a result, the north-south approaches to intersections along Old Georgetown Road and Connecticut Avenue and the northern intersections along Rockville Pike

within the study area experience traffic arriving in a constant stream rather than in platoons (concentrated groups). Furthermore, given the long cycle lengths (the number of seconds for the traffic signal to service all approaches) present along these corridors, the cross-streets are allocated long periods of green time, sometimes upwards of 80 seconds out of a 180-second cycle. The combination of high vehicular volumes arriving at a generally uniform rate and these long delays of traffic along the main road result in queues that develop in the peak direction.

During the AM peak hour, queues were observed in the southbound lanes of Rockville Pike stretching north past the Capital Beltway. Similarly, stopped traffic exists along Rockville Pike throughout much of the study area during the PM peak hour. At NSA Bethesda Gate #2 (located at Rockville Pike and South Wood Road) queue spillback from adjacent intersections to the north at Cedar Lane and Gate #1, (located at Rockville Pike at North Wood Road) resulted in gridlock conditions, preventing vehicles from exiting the installation in either direction along Rockville Pike. Furthermore, the presence of high pedestrian volumes crossing Rockville Pike to access the Medical Center Metro station caused conflicts with left-turning traffic exiting via Gate #2, causing further delays. When the Medical Center Pedestrian Tunnel is constructed, pedestrians would cross below grade and this conflict point would be eliminated.

Although the primary east-west connectors in this section of Montgomery County are the Capital Beltway and the East-West Highway, the heavy traffic congestion present along these two routes causes a significant number of vehicles traveling east-west to divert to Jones Bridge Road. The Capital Beltway experiences major congestion during both peak periods because of the high traffic volumes it serves, while the location of East-West Highway in downtown Bethesda adds delay and congestion due to a higher level of traffic coming from the large commercial and residential area. Therefore, drivers in the vicinity of NSA Bethesda who seek to travel north-south on Rockville Pike, Connecticut Avenue, or Beach Drive may use Jones Bridge Road as an east-west connector.

As a result of these diverted volumes, heavy traffic volumes were observed traveling eastbound along Jones Bridge Road towards Connecticut Avenue during the evening peak. Vehicles traveling along this road encountered a queue in excess of 2,000 feet. The maximum observed queue stretched from Connecticut Avenue west as far as Grier Road (Gate #4 located at Jones Bridge Road and Grier Road), a distance of over half a mile.

In the morning, queues in the westbound direction were mostly averted because of the prohibition of northbound left turning traffic from Connecticut Avenue onto Jones Bridge Road. This restriction causes drivers to choose an alternate east-west route such as East-West Highway. As a result of these lower volumes, queues along Jones Bridge Road at the westbound approach of its intersection with Wisconsin

Avenue peak are approximately 400 feet in length, which is not unusual for an intersection with a long cycle length.

While these observations provide a fairly regular pattern during a typical work day, typical peak arrival and departure patterns at NSA Bethesda occur outside of the AM and PM peak hours, respectively. This pattern is discussed in later sections.

3.7.1.7 Commuter Traffic Growth

The intersection peak hour traffic counts collected in October 2011 after the completion of BRAC realignment and the volumes projected for 2011 in the 2008 NNMC BRAC EIS were compared to determine the level of growth of commuter traffic throughout the overall road network. (Note that the Jones Bridge Road and University Road intersection (Gate #5) was unsignalized during the 2011 existing conditions data collection and analysis time period, but is now operating with a signal).

As shown in Table 3-13, the 2008 NNMC BRAC EIS had generally projected higher traffic volume than the actual counts taken in October 2011. On MD 355 between Pooks Hill Road and Woodmont Avenue, the 2008 NNMC BRAC EIS projections were higher than the 2011 counts, with an average of 16/18 percent (northbound/southbound) and 15/10 percent (northbound/southbound) for AM and PM peaks, respectively. On Jones Bridge Road corridor between Connecticut Avenue and MD 355, the projections were higher than the 2011 counts, with an average of 32/21 percent (eastbound/westbound) and 13/28 percent (eastbound/westbound) for AM and PM peaks, respectively. This can be attributed to several factors including higher non-auto ridership, economic factors, diversion to alternative routes such as Connecticut Avenue to the east or Old Georgetown Road to the west, and other external causes.

Table 3-13: Traffic Volume Growth Comparison

		2008 BRAC EIS Predicted Future Conditions		2011 Traffic Counts		Predicted 2011 vs Actual 2011 Conditions (%)	
Count Location	**Direction**	AM	PM	AM	PM	AM	PM
MD 355 between	Northbound	1,728	3,383	1,699	3,646	-2%	8%
Pooks Hill Rd and Cedar Ln	Southbound	3,539	2,134	2,911	2,011	-18%	-6%
MD 355 between	Northbound	1,657	2,790	1,096	1,824	-34%	-35%
Wilson Ln and Gate #2	Southbound	2,732	2,216	2,346	1,726	-14%	-22%
MD 355 between	Northbound	1,353	2,250	1,197	1,854	-12%	-18%
Gate #2 and Jones Bridge Rd	Southbound	2,567	2,185	2,093	1,770	-18%	-19%
MD 355 between	Northbound	1,663	2,592	1,400	2,082	-16%	-20%
Jones Bridge Rd and Woodmont Ave	Southbound	3,289	1,686	2,650	1,911	-19%	13%
Average of MD 355 Corridor	**Northbound**	**1,600**	**2,754**	**1,348**	**2,352**	**-16%**	**-15%**
	Southbound	**3,032**	**2,055**	**2,500**	**1,855**	**-18%**	**-10%**
Jones Bridge Rd between	Eastbound	675	2,068	528	1,692	-22%	-18%
Gate #5 and Connecticut Ave	Westbound	1,664	656	1,361	496	-18%	-24%
Jones Bridge Rd between	Eastbound	848	1,373	508	1,295	-40%	-6%
Gate #3 and MD 355	Westbound	1,365	772	1,047	529	-23%	-31%
Average of Jones Bridge Corridor	**Eastbound**	**762**	**1,721**	**518**	**1,494**	**-32%**	**-13%**
	Westbound	**1,515**	**714**	**1,204**	**513**	**-21%**	**-28%**

The exceptions are the PM peak hour traffic northbound on MD 355 between Pooks Hill Road and Cedar Lane and southbound between Jones

Bridge Road and Woodmont Road, respectively. The peak hour traffic counted in October 2011 was 8 percent higher than the 2008 NNMC BRAC EIS projection for the northbound PM peak between Pooks Hill Road and Cedar Lane and 13 percent higher for the southbound PM peak between Jones Bridge Road and Woodmont Road.

3.7.1.8 NSA Bethesda Traffic Using Rockville Pike and Jones Bridge Road

In addition to comparing the 2008 projected volumes to the 2011 volumes, the percentage of NSA Bethesda traffic using Rockville Pike and Jones Bridge Road was calculated. Using a balanced method to determine the proportion of installation versus non-installation-bound traffic for these two corridors, eight locations were evaluated. The Rockville Pike corridor included the following four locations:

1. Southbound between Cedar Lane and North Drive.
2. Southbound between South Wood Road and Jones Bridge Road.
3. Northbound between Jones Bridge Road and South Wood Road.
4. Northbound between North Drive and Cedar Lane.

The Jones Bridge Road corridor included the following four locations:

1. Eastbound between Rockville Pike and Gunnell Road.
2. Eastbound between University Road and Connecticut Avenue.
3. Westbound between Connecticut Avenue and University Road.
4. Westbound between Gunnell Road and Rockville Pike.

Since the peak hour of Rockville Pike and Jones Bridge Road occurred during a different time than the installation peak hour, the full peak periods (5:30 AM – 9:00 AM and 3:00 PM – 6:30 PM) were used for determining the percentage of NSA Bethesda traffic relative to total network volume. This time period of nearly 4 hours accounts for both the peak of the installation and provides an approximate percentage for the AM and PM periods. The percentages do not take into account installation traffic associated with visitors and/or patients outside of the peak period. For example, the total AM peak period volume southbound along Rockville Pike between Cedar Lane and North Drive was 11,099. The total volume entering NSA Bethesda through Gates #1 and #2 from the north was 2,455 during the same period. By dividing 2,455 into 11,099, the result would be 22.1 percent.

Based upon the procedures discussed above, during the AM peak period, the highest percentage of NSA Bethesda-bound traffic along these corridors occurred in the Jones Bridge Road westbound direction, between Connecticut Avenue and University Road with 41.6 percent. The lowest percentage occurred along Rockville Pike in the southbound direction, between South Wood Road and Jones Bridge Road with 1.7 percent. During the PM peak period, the highest percentage of NSA Bethesda-bound traffic along these corridors occurred in the Jones Bridge Road westbound direction, between Jones Bridge Road and Gunnell Road with 34.0 percent. The lowest percentage occurred along Jones

Bridge Road in the eastbound direction, between Rockville Pike and Gunnell Road with 3.0 percent.

Table 3-14 shows the AM and PM peak period comparison of NSA Bethesda-bound traffic and total volumes along Rockville Pike, and Table 3-15 shows the AM and PM peak period comparison of NSA Bethesda-bound traffic and total volumes along Jones Bridge Road.

Table 3-14: AM and PM Peak Period Comparison of NSA Bethesda-bound Traffic and Total Traffic Volume along Rockville Pike

Rockville Pike - AM Peak Period (5:30 A.M. - 9:00 A.M.)				
Volume	**Rockville Pike between Cedar Lane and North Drive**		**Rockville Pike between Jones Bridge Road and South Wood Road**	
	Northbound	**Southbound**	**Northbound**	**Southbound**
Total - Rockville Pike	3,035	11,099	2,725	4,898
Total - Gates #1 & #2	443	2,455	672	84
Total - NSA Bethesda Contribution (%)	**14.6%**	**22.1%**	**24.7%**	**1.7%**
Rockville Pike - PM Peak Period (3:00 P.M. - 6:30 P.M.)				
Volume	**Rockville Pike between Cedar Lane and North Drive**		**Rockville Pike between Jones Bridge Road and South Wood Road**	
	Northbound	**Southbound**	**Northbound**	**Southbound**
Total - Rockville Pike	8,266	6,073	5,135	5,466
Total - Gates #1 & #2	2,371	444	201	248
Total - NSA Bethesda Contribution (%)	**28.7%**	**7.3%**	**3.9%**	**4.5%**

Table 3-15: AM and PM Peak Period Percent of NSA Bethesda-bound Traffic along Jones Bridge Road.

Jones Bridge Road - AM Peak Period (5:30 A.M. - 9:00 A.M.)				
Volume	**Jones Bridge Road between Rockville Pike and Gunnell Road**		**Jones Bridge Road between Connecticut Avenue and University Road**	
	Eastbound	**Westbound**	**Eastbound**	**Westbound**
Total - Jones Bridge Road	1,105	2,703	680	4,443
Total - Gates #3, #4, & #5	257	106	201	1,850
Total - NSA Bethesda Contribution (%)	**23.3%**	**3.9%**	**29.6%**	**41.6%**
Jones Bridge Road - PM Peak Period (3:00 P.M. - 6:30 P.M.)				
Volume	**Jones Bridge Road between Rockville Pike and Gunnell Road**		**Jones Bridge Road between Connecticut Avenue and University Road**	
	Eastbound	**Westbound**	**Eastbound**	**Westbound**
Total - Jones Bridge Road	4,385	1,869	5,513	1,677
Total - Gates #3, #4, & #5	131	635	1,731	274
Total - NSA Bethesda Contribution (%)	**3.0%**	**34.0%**	**31.4%**	**16.3%**

Vehicular Gate Access and Operations

NSA Bethesda has five entrances, each of which also serves as a security checkpoint. Two entrances are located along Rockville Pike

(Gates #1 and #2) and the remaining three are located along Jones Bridge Road (Gates #3, #4, and #5).

The locations of these entrances (Gates #1 through #5 respectively) are shown in Figure 3-6, as intersections 7, 9, 11, 12, and 13. They are discussed below.

3.7.1.9 Security Gate Configurations

The two entrances off Rockville Pike are connected by an internal loop road (Wood Road). The entrance at North Wood Road (Gate #1, North Wood Road Gate) is located just south of Cedar Lane, and is aligned with the entrance to the NIH commercial vehicle inspections facility. At this intersection, a half signal controls the northbound, westbound, and southbound left turn movements while allowing southbound through traffic along Rockville Pike to continue without interruption. Inbound and outbound pedestrian traffic is permitted at all times the gate is open, as is bicycle traffic via the inbound and outbound on-street bicycle lanes. This gate is configured with a total of four lanes, two of which are reversible, and operates under the following schedule:

- Monday through Friday, 5:00 AM - 5:30 AM: two lanes inbound, one lane outbound
- Monday through Friday, 5:31 AM - 7:30 AM three lanes inbound, one lane outbound
- Monday through Friday, 7:31 AM - 2:00 PM: two lanes inbound, one lane outbound
- Monday through Friday, 2:01 PM - 6:00 PM: one lane inbound, three lanes outbound
- Monday through Friday, 6:01 PM - 7:00 PM: two lanes inbound, one lane outbound
- All other times: Closed

The entrance at South Wood Road (Gate #2, South Wood Road Gate) is the main entrance to the installation, and is located across Rockville Pike from the NIH South Drive entrance and the WMATA Medical Center Metro station. This gate is open 24 hours, serving vehicular traffic and is the main access point for pedestrian traffic, most of which is generated by the Medical Center Metro station across Rockville Pike and its adjacent transit bus terminal. Pedestrian access is permitted 24 hours a day via a separate sidewalk checkpoint. Access for cyclists is provided along one inbound and one outbound on-street bicycle lane, which is served by the main vehicular security checkpoint. The South Gate is configured with a total of three lanes, one of which is reversible. Gate #2 operates under the following schedule:

- Monday through Friday, 5:00 AM - 2:00 PM: two lanes inbound, one lane outbound

- Monday through Friday, 2:01 PM - 7:00 PM: one lane inbound, two lanes outbound
- Monday through Friday, 7:01 PM – 4:59 AM: one lane inbound, one lane outbound
- Saturday and Sunday: two lanes inbound, one lane outbound

The three entrances off Jones Bridge Road are Gunnell Road (Gate #3), Grier Road (Gate #4), and University Road (Gate #5). At the time that observations were made, Gate #3 and Gate #4 were controlled by traffic signals with University Road terminating at a stop sign. However, a traffic signal has been constructed at Gate #5 and entered into operation in December 2011, following completion of the field observations conducted in support of this study.

The gate at Gunnell Road (Gate #3, Gunnell Road Gate) permits pedestrian access during its operating hours, providing convenient access to downtown Bethesda and to the Jones Bridge Road bus lines from the southern portion of the installation. Gate #3 is also convenient to the installation's gas station. The gate has one inbound and one outbound lane, with pedestrian access permitted at all times that the gate is open. Gate #3 operates under the following schedule:

- Monday through Friday, 5:00 AM – 7:00 PM: one lane inbound, one lane outbound
- All other times: Closed

Gate #3 would be under construction starting summer 2012 (upon completion of Gate #4 to ensure at least four gates are operational). It is expected that Gate #3 construction would be complete by December 2012, with a new guardhouse and Gunnell Road upgrades.

The next gate to the east on Jones Bridge Road is located along Grier Road (Gate #4, Grier Road Gate). This gate is currently closed for construction and will reopen this summer, while a new guardhouse and Grier Road undergo upgrades. During the time period that the existing conditions were collected and analyzed, this gate handled all inbound commercial vehicles and had one inbound travel lane and one outbound travel lane, under the following schedule:

- Monday through Friday, 5:00 AM – 2:00 PM: Inbound commercial vehicle traffic only
- Monday through Friday, 2:01 PM – 3:00 PM: one lane inbound commercial vehicle traffic, one lane outbound
- Monday through Friday, 3:01 PM – 6:00 PM: one lane outbound
- All other times: Closed

The easternmost gate of NSA Bethesda is located at the intersection of Jones Bridge and University Road (Gate #5, University Road Gate). Gate

#5 features on-street bike lanes in both the inbound and outbound directions and these lanes integrate into the vehicular travel lanes at USU. The new gatehouse at the Gate #5 contains one inbound and one outbound lane for privately owned vehicle use in parallel with a commercial vehicles inspection facility with two inbound lanes. Gate #5 serves as the main gate for deliveries and truck traffic during its hours of operation. At all other times, consistent with operating procedures in place today, delivery vehicles would be inspected at Gate #2, the 24-hour gate. Gate #5 currently operates under the following schedule:

- Monday through Friday, 5:00 AM – 6:00 PM: one lane for privately owned vehicles inbound, two lanes for the commercial vehicles inspection facility, one lane outbound
- All other times: Closed

3.7.1.10 Gate Traffic Volumes

In addition to calculating the overall intersection and system peak periods throughout the study network, peak period counts were summed at each of the five access gates with the overall gate percentage (inbound and outbound movements combined) to arrive at an overall trip generation estimate for NSA Bethesda. This value can later be compared to the typical number of staff and visitors present on-site to determine the peak hour mode split between automotive and non-automotive travel modes. The system peak is defined as the hour-long period with the highest vehicular traffic across all 17 external study intersections. In contrast, the gate peak hour is the hour of maximum volume at all five access gates, which should correlate strongly with the peak hour of installation-generated trips and is typically referred to as the peak hour of the generator. It should be noted that the peak hour of NSA Bethesda was over an hour earlier than the peak hour of the adjacent street traffic during both peak periods (Table 3-16).

The total trips generated by NSA Bethesda during the vehicular count periods of 5:30 AM – 9:00 AM and 3:00 PM – 6:30 PM with gate percentages (inbound and outbound combined) are shown in Table 3-16. While these values are not critical for the transportation analysis prepared for NSA Bethesda EIS, they do represent a large portion of the total number of trips realized on-site during an average work day. For comparison purposes, the total gate peak hour trips shown above represent between 35 and 40 percent of the total traffic for the installation during the peak periods shown on Table 3-17.

Table 3-16: NSA Bethesda Gate and System Peak Hour Traffic Volumes

Gate	Movement	Gate Peak Hour				System Peak Hour			
		AM		PM		AM		PM	
		6:00 - 7:00 AM		*3:45 - 4:45 PM*		*7:45 - 8:45 AM*		*4:45 - 5:45 PM*	
1. North Wood Road (Gate #1)	Inbound	864		99		416		71	
	Outbound	75	40%	738	38%	113	40%	451	33%
2. South Wood Road (Gate #2)	Inbound	482		127		190		102	
	Outbound	63	23%	214	16%	87	21%	198	19%
3. Gunnell Road (Gate #3)	Inbound	413		126		240		96	
	Outbound	74	21%	394	24%	116	27%	313	26%
4. Grier Road (Gate #4)	Inbound	57		---		33		---	
	Outbound	---	2%	478	22%	---	2%	335	21%
5. University Road (Gate #5)	Inbound	309		8		135		7	
	Outbound	2	13%	10	1%	2	10%	7	1%
Overall Traffic Volume	Inbound	2,125		360		1,014		276	
	Outbound	214		1,834		318		1,304	
	Total	**2,339**	100%	**2,194**	100%	**1,332**	100%	**1,580**	100%

Table 3-17: NSA Bethesda Peak Period Traffic Volumes

Gate	Movement	Peak Period Traffic Volumes					
		AM		PM		Total	
1. North Wood Road (Gate #1)	Inbound	2,104		303		2,407	
	Outbound	295	39%	1,906	36%	2,201	37%
2. South Wood Road (Gate #2)	Inbound	1,058		414		1,472	
	Outbound	284	22%	755	19%	1,039	20%
3. Gunnell Road (Gate #3)	Inbound	1,125		374		1,499	
	Outbound	310	23%	1,172	25%	1,482	24%
4. Grier Road (Gate #4)	Inbound	156		---		156	
	Outbound	---	3%	1,155	19%	1,155	11%
5. University Road (Gate #5)	Inbound	807		31		838	
	Outbound	4	13%	40	1%	44	7%
Overall Traffic Volume	Inbound	5,250		1,122		6,372	
	Outbound	893		5,028		5,921	
	Total	**6,143**	**100%**	**6,150**	**100%**	**12,294**	100%

3.7.1.11 Gate Vehicle Occupancy and Classification

Following the external intersection turning movement counts described in Section 3.7.1.4, vehicle occupancy and classification counts were conducted at each of NSA Bethesda gates on Tuesday, 25 October 2011. These counts provide an understanding of the means by which staff and visitors travel to NSA Bethesda. These characteristics can be used to further clarify the mode split.

Vehicle Occupancy

Vehicle occupancy data were collected at each of the gates serving NSA Bethesda in order to determine the number of individuals in both inbound and outbound private vehicles. This count excluded all

commercial vehicles as well as transit and shuttle buses and did not count the total number of individuals in each vehicle where there were 3 or more passengers. The results of that count, as shown in Table 3-18, indicate the following:

- During the AM peak hour of the entire external traffic network, 864 of the 1,047 (83 percent) total vehicles entering the installation arrived as a single occupant vehicle. This is comparable to the PM peak hour when 1,211 of the 1,436 (84 percent) total vehicles exiting the installation departed as single occupant vehicles.

- The peak hour movements associated with the outbound movement during the AM and the inbound movement during the PM also experience similar percentages; however, there were significantly fewer vehicles making these movements.

- The number of vehicles shown to enter and exit the installation during both peak periods having three or more passengers is less than 1 percent of the total installation traffic while approximately 14 percent of the vehicles entering and exiting the installation had two individuals.

Based on the information shown in Table 3-18, gate traffic accessing NSA Bethesda has an average occupancy of 1.150 occupants per vehicle during the AM system peak hour and 1.165 occupants per vehicle during the PM system peak hour. Note that this value does not account for shuttle bus traffic and that all vehicles carrying more than three occupants are treated as having only three occupants because of the difficulty of counting passengers in large carpool vehicles.

The 2011 occupancy measurements show a slight improvement towards the objectives of the 2008 Transportation Management Plan of the then-NNMC, which include the goal to "Increase Average Vehicle Occupancy ratios from 1.12 to 3.0 by 2011." The measured occupancy values observed at the gate entrances from October 2011 show a slight improvement from 1.12 occupants per vehicle to 1.150-1.165 occupants per vehicle. However, it should be noted that the 2008 TMP values are based on average vehicle occupancy ratios, which are defined as the number of employees on the installation per vehicles parked at the installation. Therefore, a direct comparison cannot be made between the 2008 TMP-stated average vehicle occupancy and 2011 conditions without obtaining staffing throughout the day and parking lot occupancy.

Table 3-18: NSA Bethesda Vehicle Occupancy Summary

		Gate 1	Gate 2	Gate 3	Gate 4	Gate 5	All Gates		
							Vehicle Trips	Person Trips	2011 Occupancy
Inbound 1	**AM**	369	141	216	13	125	**864**	864	
	PM	66	63	86	0	3	**218**	218	
Inbound 2	**AM**	101	34	27	0	15	**177**	354	
	PM	11	16	3	0	1	**31**	62	
Inbound 3+	**AM**	2	1	1	0	2	**6**	18	
	PM	2	0	0	0	0	**2**	6	
Inbound Total	**AM**	472	176	244	13	142	**1,047**	1,236	***1.181***
	PM	79	79	89	0	4	**251**	286	***1.139***
Outbound 1	**AM**	151	66	91	0	9	**317**	317	
	PM	493	131	300	282	5	**1,211**	1,211	
Outbound 2	**AM**	2	8	7	0	1	**18**	36	
	PM	90	34	40	41	2	**207**	414	
Outbound 3+	**AM**	0	0	0	0	0	**0**	0	
	PM	8	7	2	1	0	**18**	54	
Outbound Total	**AM**	153	74	98	0	10	**335**	353	***1.054***
	PM	591	172	342	324	7	**1,436**	1,679	***1.169***
All Traffic	**AM**	625	250	342	13	152	**1,382**	1,589	***1.150***
	PM	670	251	431	324	11	**1,687**	1,965	***1.165***

Vehicle Classification

The vehicle classification count conducted at the installation gates collected the total number of vehicles that were not classified as a private vehicle. Those included the following vehicle types: small trucks (delivery vans and small box trucks), large trucks (large box trucks and tractor trailers), transit vehicles (buses and shuttle buses), and bicycles. The results indicate that the heaviest concentrations of non-auto trips were found at Gates #2 and #3, which is most likely due to their proximity to the Medical Center Metro station and to downtown Bethesda, respectively. The overall results for the entire installation are shown in Table 3-19.

Table 3-19: NSA Bethesda Vehicle Classification Summary

	All NSA Bethesda Gates							
	Small Trucks		*Large Trucks*		*Transit Vehicles*		*Bikes*	
	In	Out	In	Out	In	Out	In	Out
Morning								
5:30 AM	10	2	2	0	1	0	3	0
5:45 AM	6	5	1	0	1	2	5	0
6:00 AM	7	8	6	0	2	2	6	2
6:15 AM	11	2	2	1	6	8	5	0
6:30 AM	3	2	3	1	9	8	5	2
6:45 AM	2	0	4	1	8	6	7	2
7:00 AM	7	0	6	0	10	5	8	1
7:15 AM	10	1	1	1	10	9	14	0
7:30 AM	6	2	3	4	5	3	8	0
7:45 AM	**8**	**2**	**2**	**5**	**9**	**9**	**13**	**0**
8:00 AM	**8**	**1**	**4**	**3**	**7**	**8**	**8**	**0**
8:15 AM	**9**	**2**	**6**	**5**	**7**	**5**	**3**	**0**
8:30 AM	**6**	**4**	**0**	**2**	**10**	**9**	**8**	**0**
8:45 AM	3	2	0	1	6	6	1	7
Evening								
3:00 PM	3	12	1	8	11	4	0	7
3:15 PM	3	7	0	7	5	8	0	3
3:30 PM	3	14	1	12	4	4	1	9
3:45 PM	1	4	0	3	7	6	0	0
4:00 PM	2	3	0	3	13	2	2	10
4:15 PM	2	2	0	1	5	6	0	7
4:30 PM	1	0	0	3	8	6	1	7
4:45 PM	**2**	**0**	**0**	**1**	**8**	**5**	**0**	**8**
5:00 PM	**4**	**1**	**0**	**3**	**5**	**8**	**1**	**11**
5:15 PM	**1**	**0**	**0**	**3**	**6**	**4**	**0**	**5**
5:30 PM	**1**	**1**	**0**	**2**	**4**	**6**	**0**	**6**
5:45 PM	1	1	0	1	5	3	0	8
6:00 PM	3	1	0	3	3	8	1	4
6:15 PM	1	2	0	1	3	4	1	2

Note: The BOLD text references the system AM and PM peak hour

Based on the totals below and the total number of private vehicle trips (see Table 3-18), it is estimated that approximately 12 percent of the AM peak hour traffic and 6 percent of the PM peak hour traffic consists of non-private vehicles.

3.7.1.12 Observed Gate Operations

Due to the secure nature of NSA Bethesda, the five security gates are the only means of ingress and egress for staff and visitors to the WRNMMC and other tenants of NSA Bethesda. The installation is staffed 24 hours a day, but experiences the majority of staff and visitor traffic during normal business hours. The peak period for inbound traffic is during NSA Bethesda's AM peak hour (6:00 AM – 7:00 AM). All

personnel entering the installation must undergo security screening and minor queues were observed at Gates #1 and #2 for inbound traffic as a result of the screening process. However, the gate queues were generally observed to not interfere with the operation of Rockville Pike and Jones Bridge Road. In addition, recent upgrades to Gates #1 and #2 have further helped to minimize security screening related queuing.

Separate from the minor queues at Gates #1 and #2, queues (five to ten vehicles) were observed along the Southbound Rockville Pike left turn approach at intersection #7, Rockville Pike and North Wood Road, extending back beyond the storage lane. However, because the system AM peak hour (7:45 AM – 8: 45 AM) differs from the NSA Bethesda AM peak hour (6:00 AM – 7:00 AM), minor delays were observed along the Rockville Pike southbound through lanes. At the time of data collection in October 2011, no queues were observed along Jones Bridge Road. As is the case during the AM peak, the PM peak hour for NSA Bethesda outbound traffic differs from the system PM peak hour. Outbound NSA Bethesda traffic can only exit the installation during the green time allocated to an individual signal phase at Gates #1 and #2. The minor nature of these approaches relative to the high volumes seen along Rockville Pike also means that these approaches allocate less green time than the main roadway through traffic movements. Therefore, even though the outbound traffic is not subject to delays from security procedures, the traffic signal controls that exist adjacent to Gates #1 and #2 cause outbound traffic to experience delays.

In addition to the delays caused by signals, outbound vehicles exiting NSA Bethesda were funneled from a large number of parking facilities to a relatively small number of security gates. The resulting bottleneck effect manifested itself in outbound delays at Gates #1, #2, and #4. Right-turning traffic at Gates #1 and #2 was observed to be impeded by heavy traffic along Rockville Pike in the northbound direction, with left-turning traffic at Gate #2 experiencing delays as a result of heavy traffic from adjacent intersections, competing right turns from vehicles and buses exiting the NIH campus, and high pedestrian volumes at the crosswalk along the southern side of this intersection. The resulting queues at Gate #2 were estimated to reach up to 600 feet or approximately 45 vehicles. Similarly, queues at Gate #4 were observed to spill back onto South Palmer Road, totaling approximately 1,100 feet. As indicated earlier, Gate #4 is currently closed during construction of a new gate facility and upgrades to Grier Road.

While there was a queue observed for outbound traffic at Gate #4 during the PM peak hour, there was a relative lack of delay at Gates #3 and #5. Queues at Gate #3 were observed to be no more than 600 feet in length (30 vehicles), with no significant queues at all observed at Gate #5. However, at the time that field observations were conducted, the new traffic signal at Gate #5 had not yet been activated, so it is

possible that with this new signal, drivers would divert to University Road as a way to balance the outbound traffic distribution.

The two Gates off Rockville Pike are connected by an internal loop road (Wood Road). Access to the central portion of Wood Road between North Palmer Road and South Palmer Road in front of Building 1 is restricted because of anti-terrorism and force protection measures.

3.7.1.13 Internal Roadway Conditions

In addition to the external roadway network and conditions at the security gates, conditions along NSA Bethesda's internal roadway network were also analyzed as a part of this report. NSA Bethesda serves numerous tenants and must therefore have a functional and comprehensive internal circulation network. This network, along with the 12 internal study intersections covered in this section of the report, is shown in Figure 3-9. All 12 internal study intersections are stop-controlled.

3.7.1.14 Internal Existing Lane Utilization

The external roadway and internal NSA Bethesda lane geometry and traffic control were collected. Again, several visits were made to NSA Bethesda to ensure that accurate information was collected and available for this report. Based on those field visits, the lane geometry and traffic control was confirmed and can be found in Appendix D, Figure 6.

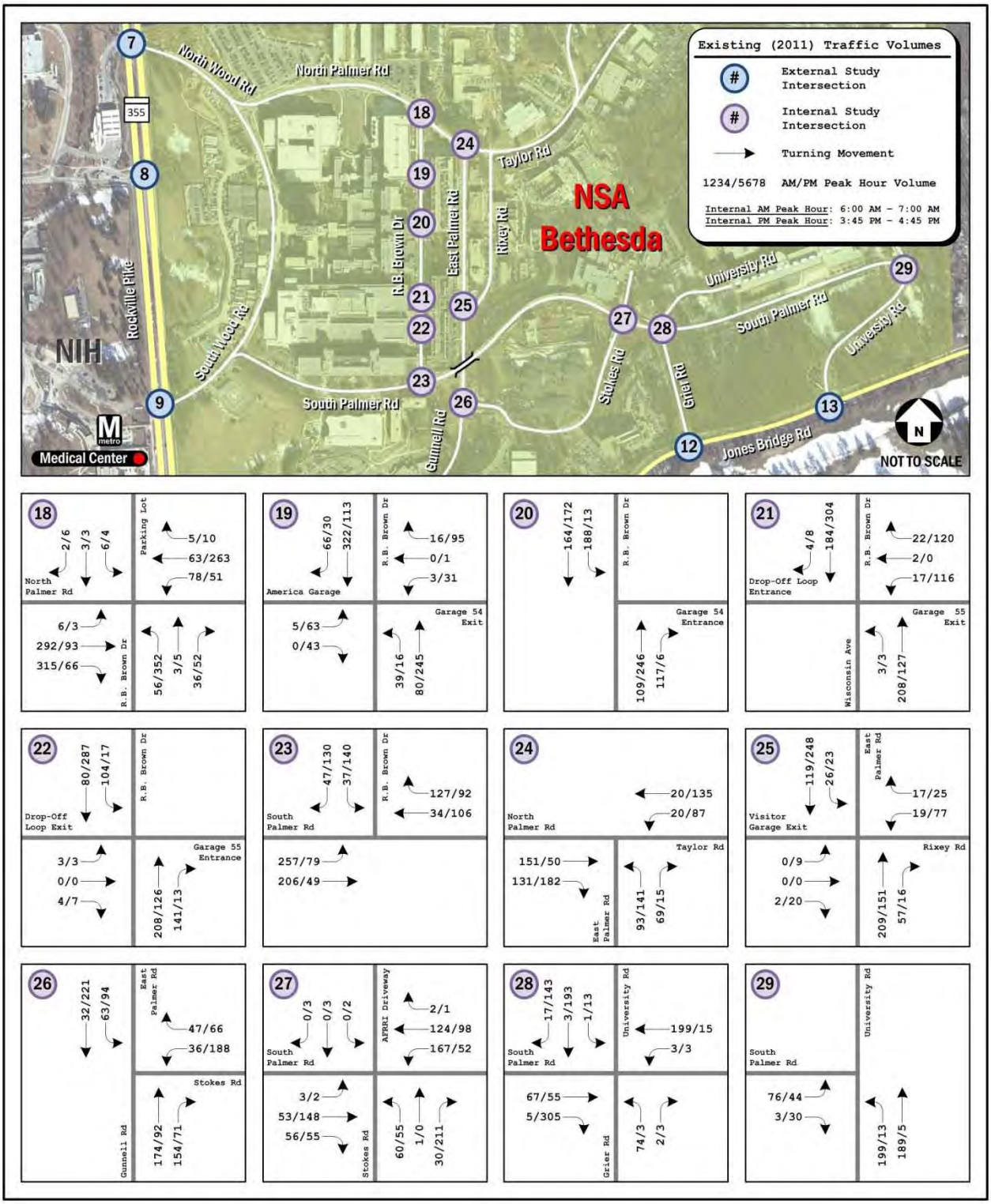
3.7.1.15 Internal Existing Peak Hour Traffic Volumes

In addition to the external intersections studied as part of NSA Bethesda EIS, several intersections within the confines of the installation were selected to be studied as part of the future alternatives considered on the installation and are shown on Figure 3-9. There are a total of 12 internal study intersections and the manual turning movement counts for each of these were counted on Tuesday, 25 October 2011, consistent with the method used for the external intersections as described in Section 3.7.1.4. In addition, 19 automatic traffic record counts were obtained covering the period between October 25th and November 1st to provide 24-hour counts throughout the installation.

While the peak period of the external network generally occurred from 7:45 – 8:45 AM and 4:45 – 5:45 PM, the peak period internal to NSA Bethesda is significantly earlier at 6:00 – 7:00 AM and 3:45 – 4:45 PM. Since this period represents the worst-case scenario for traffic congestion within the installation, it was used for purposes of evaluating the internal intersections. The peak hour traffic volumes assumed for the internal intersections are shown on Figure 3-10.

Figure 3-9: Internal Study Intersections

Figure 3-10: Internal Traffic Volumes - Existing (2011) Conditions



3.7.1.16 Truck Access and Circulation Patterns

Truck access to NSA Bethesda was permitted along Grier Road (Gate #4) at the time the existing conditions were obtained, with inbound traffic at this gate restricted to commercial vehicles only between 5:00 AM and 3:00 PM, Monday through Friday, the only times that inbound traffic is permitted at this location. The truck inspection facilities are now located at the Gate #5 inspection complex, which has an overhanging shelter for inspection staff and improved security controls. Apart from this development, the location of loading facilities and the egress route for truck traffic from the installation remains the same. These loading facilities and the ingress and egress routing for trucks and other heavy vehicles are shown in Figure 3-11.

3.7.1.17 NSA Bethesda Internal Capacity Analysis

To evaluate the internal NSA Bethesda network, the study area intersections depicted in Figure 3-9 were analyzed utilizing the HCM method discussed in Section 3.7.1.5. These procedures, computed using Synchro Traffic Analysis software, were used because all the internal study intersections are controlled by stop signs.

Utilizing the HCM method, it was determined that each of the internal study intersections, with one exception, currently operate at acceptable levels of service during both peak periods as shown in Table 3-20. The only exception is the intersection of R.B. Brown Drive with the American Garage and the staff parking garage. The exiting movements from each of the garages at this intersection currently operate beyond acceptable levels primarily due to the heavy pedestrian volume at this location. More than 900 pedestrians utilize sidewalks along R.B. Brown Drive at this intersection during the PM peak hour, which the HCM calculates to cause significant delays in traffic. Without these pedestrians, the HCM analysis would show acceptable levels.

It should be noted that field observations do not show significant levels of delay at this location. These high delay values do not match the actual delays that were observed in the field. Instead, it is likely that the computed delay values result from the fact that HCM calculation procedures give total priority to pedestrians at stop-controlled approaches. In this case, the extremely high volume of pedestrians leaves virtually no gaps for exiting vehicles. Field observations show that the actual conditions of these approaches are more balanced, with pedestrians occasionally yielding to vehicles entering and exiting the parking facilities when they notice a queue beginning to form. This common courtesy prevents the high values of delay that were calculated using the HCM procedures from actually occurring.

Figure 3-11: Truck Access and Service/Loading Facilities

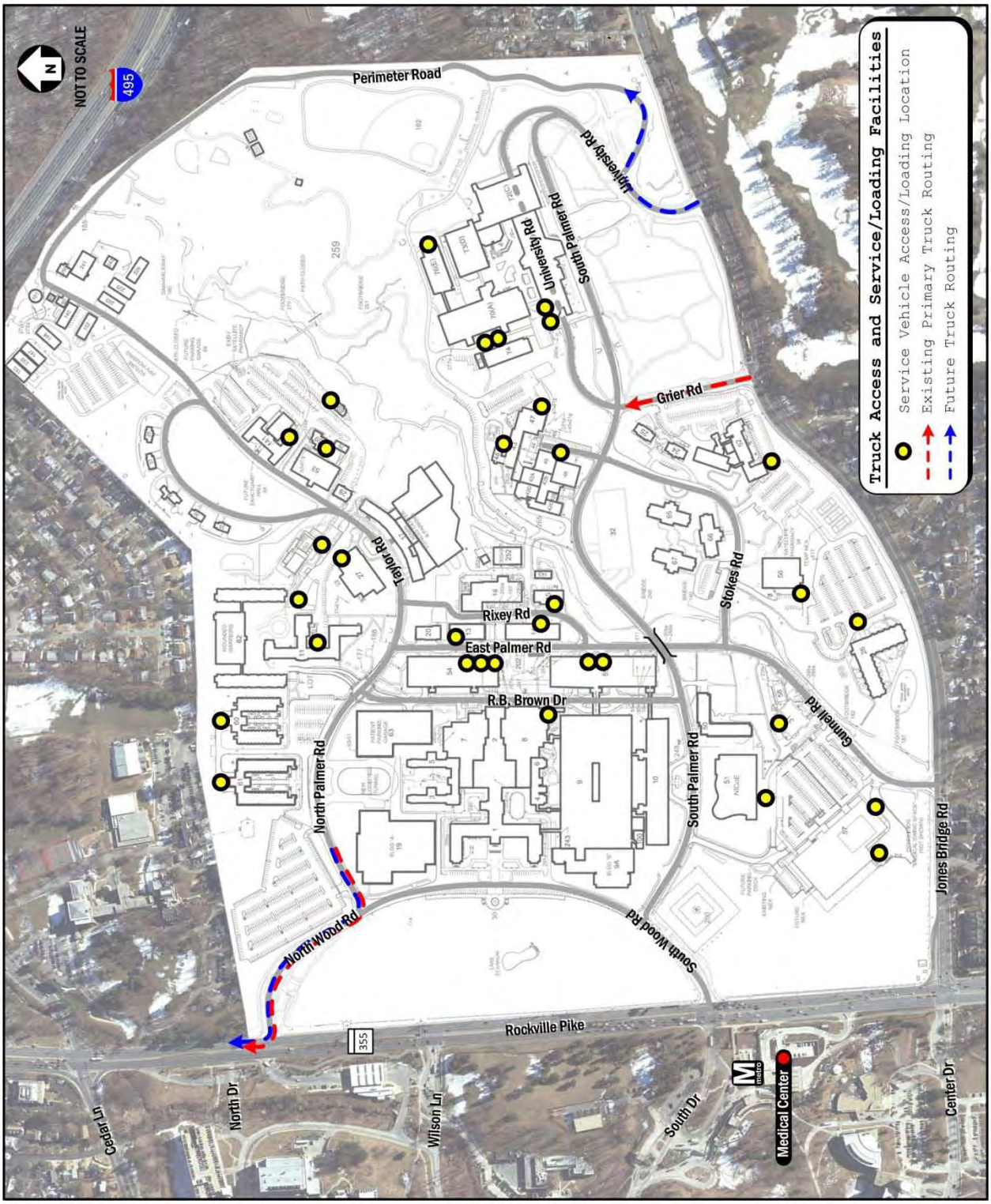


Table 3-20: NSA Bethesda Internal Level of Service Results

	Approach	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
18. Parking Lot/R.B. Brown Drive & North Palmer Road	**Overall**	**10.1**	**B**	**15.5**	**C**
	Eastbound	9.6	A	19.2	C
	Westbound	9.0	A	9.3	A
	Northbound	10.6	B	9.3	A
	Southbound	8.6	A	14.3	B
19. R.B. Brown Drive & America Garage/ Garage 54 Exit	Eastbound	17.6	C	***	*F*
	Westbound	12.8	B	***	*F*
	Northbound Left	3.1	A	0.6	A
20. R.B. Brown Drive & Garage 54 Entrance	**Overall**	**10.5**	**B**	**8.8**	**A**
	Northbound	9.2	A	9.0	A
	Southbound	11.5	B	8.5	A
21. R.B. Brown Drive & Driveop-Off Loop Entrance/ Garage 55 Exit	**Overall**	**9.1**	**A**	**11.3**	**B**
	Westbound	8.1	A	10.9	B
	Northbound	9.4	A	9.5	A
	Southbound	8.8	A	12.3	B
22. R.B. Brown Drive & Driveop-Off Loop Exit/ Garage 55 Entrance	**Overall**	**9.7**	**A**	**9.4**	**A**
	Eastbound	8.1	A	7.8	A
	Northbound	10.1	B	8.3	A
	Southbound	9.0	A	10.0	A
23. R.B. Brown Drive & South Palmer Road	**Overall**	**9.8**	**A**	**10.6**	**B**
	Eastbound	10.3	B	8.9	A
	Westbound	8.6	A	10.7	B
	Southbound	9.1	A	11.4	B
24. East Palmer Road & North Palmer Road/Taylor Road	**Overall**	**9.4**	**A**	**10.1**	**B**
	Eastbound	9.6	A	9.5	A
	Westbound	8.4	A	10.5	B
	Northbound	9.3	A	10.3	B
25. East Palmer Road & Visitor Garage Exit/Rixey Road	**Overall**	**10.0**	**A**	**9.9**	**A**
	Eastbound	7.7	A	8.3	A
	Westbound	8.4	A	9.7	A
	Northbound	10.6	B	9.4	A
	Southbound	8.8	A	10.6	B
26. East Palmer Road/Gunnell Road & Stokes Road	**Overall**	**8.9**	**A**	**13.7**	**B**
	Westbound	8.3	A	14.5	B
	Northbound	9.2	A	10.5	B
	Southbound	8.7	A	14.7	B
27. AFRRI Dwy/Stokes Road & South Palmer Road	**Overall**	**9.5**	**A**	**10.5**	**B**
	Eastbound	8.2	A	10.1	B
	Westbound	10.4	B	10.9	B
	Northbound	8.8	A	10.7	B
	Southbound	0.0	A	8.6	A
28. University Road/Grier Road & South Palmer Road	**Overall**	**8.7**	**A**	**12.5**	**B**
	Eastbound	8.4	A	13.7	B
	Westbound	9.0	A	9.2	A
	Northbound	9.0	A	8.9	A
	Southbound	6.9	A	11.9	B
29. University Road & South Palmer Road	Westbound	*3.9*	A	5.2	A
	Northbound	*15.1*	C	9.4	A

**** HCM unsignalized intersection capacity analysis techniques result in abnormally high levels of delay at intersections with large pedestrian volumes. These conditions were not observed in the field.*

3.7.1.18 Internal Observation Findings

Inbound traffic arrives on installation at a relatively constant rate, and the variety of destinations on installation means that this traffic begins to disperse throughout NSA Bethesda's roadway network almost immediately after entering the installation. Because inbound traffic is dispersed throughout the installation, vehicular conditions on the internal roadway network are generally acceptable, with the only interruptions coming at stop-controlled intersections and pedestrian crosswalks.

The only significant congestion observed on the installation were the queues of outbound traffic observed passing through the security gates during the PM peak hour and the slow-moving traffic that occasionally preceded these queues. However, as was described in Section 3.7.2.4, these queues result from the necessities of signal timing at the external intersections adjacent to the security gates and not from any particular deficiency in NSA Bethesda's internal roadway network or the gates themselves.

3.7.2 Internal Parking Facilities

Parking spaces at NSA Bethesda are located throughout the installation. There is a mixture of structured parking facilities (eight parking structures: four freestanding garages and four parking garages under buildings), parking lots, and parking available along the internal roadway network. Garages directly serve the medical facility, USU, and Building 17, with more planned to serve the Wounded Warrior complex, and Navy Exchange. There is a parking structure located near the center of the installation called the Multi Use Parking Structure.

Each facility has spaces assigned to various groups of users. For example, a structured facility might have spaces reserved for ranking officers, rideshare use, ADA compliant use, patients, government officials, visitors, residents, and staff. To ensure parking facilities best serve all installation missions, parking tags are assigned to staff and can only be used in specific facilities based upon the tag designation. There are four tag designations: medical facility, AFRRI), barracks/lodging, and all others.

As part of its ongoing transportation management program, in September 2011, NSA Bethesda implemented a parking management program that controls the number of staff who can park at the installation based on the availability of staff parking spaces, including incentives for carpool usage. Employees receiving Federal transit subsidies are not allowed to receive hanging tags. Patients and visitors have dedicated parking available for their use.

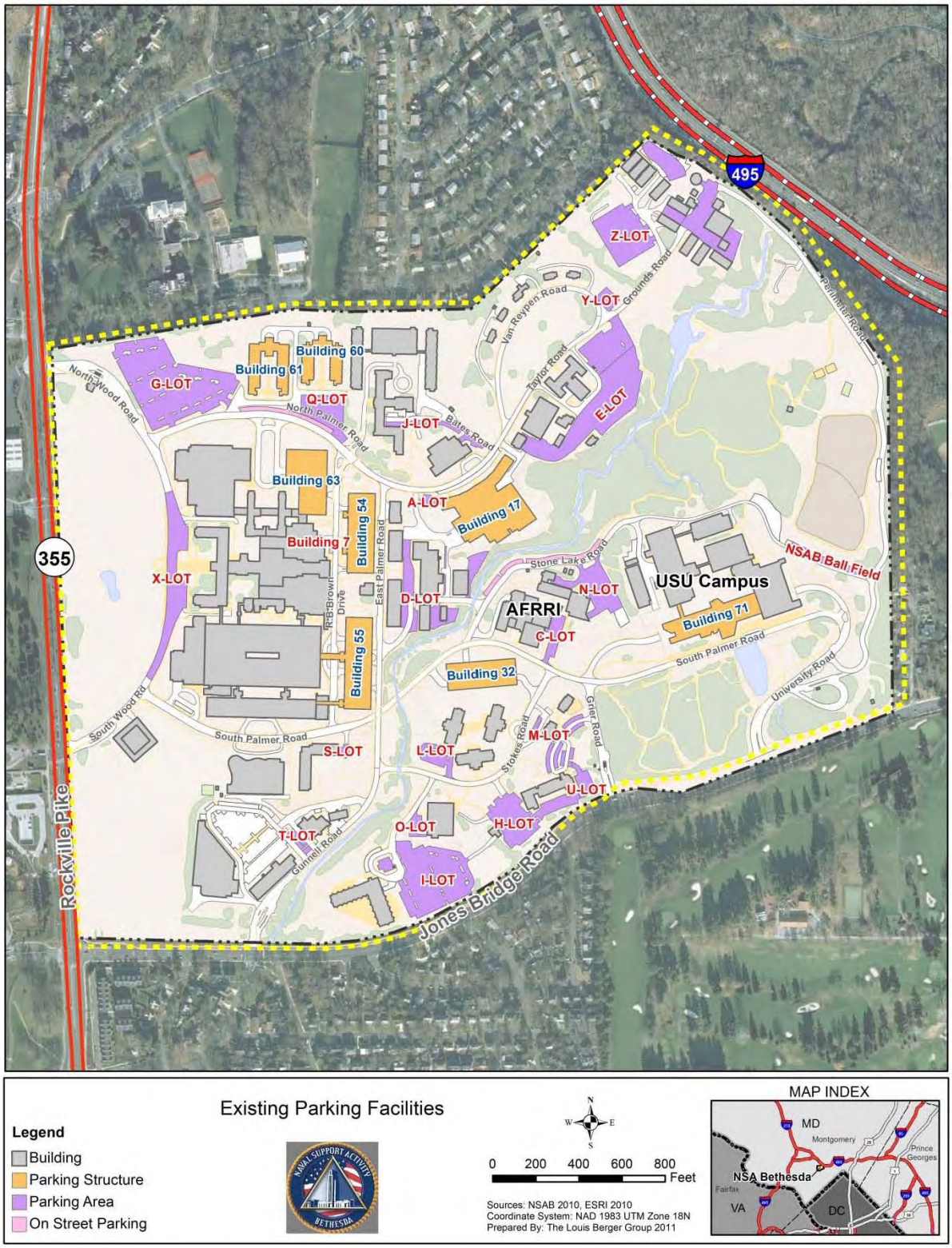
There are currently a total of 7,686 spaces available at NSA Bethesda, composed of 3,525 staff spaces, 2,436 patient spaces, 1,120 visitor spaces (includes parking for retail), 457 barracks/lodge spaces, and 148 government vehicle spaces. Table 3-21 lists the existing parking

facilities with space distribution and Figure 3-12 shows the existing parking facility locations.

Table 3-21: Existing Parking Facilities with Space Distribution

Surface Parking	Staff	Patient	Visitor/ Retail	Barracks/ Lodging	Gov't	Capacity
A-LOT	0	0	8			**8**
C-LOT	23					**23**
D-LOT	75	0				**75**
E-LOT	272	0				**272**
G-LOT	394	0			15	**409**
H-LOT	49	54	54	6	1	**164**
I-LOT	0	150	124		2	**276**
J-LOT	36		12			**48**
L-LOT				20		**20**
M-LOT			12			**12**
N-LOT	62	0	0			**62**
O-LOT		15				**15**
Q-LOT	0	0		80		**80**
S-LOT					2	**2**
T-LOT			23			**23**
U-LOT	0	0	57			**57**
X-LOT	19	0	20			**39**
Y-LOT	0	0	0	0	25	**25**
Z-LOT	60	0	144		28	**232**
Daycare	0	0	22		2	**24**
NSAB Ball Field	0	0	60		0	**60**
Structured Parking	**Staff**	**Patient**	**Visitor/ Retail**	**Barracks/ Lodging**	**Gov't**	**Capacity**
Building 17	99	95	114	236	6	**550**
Building 32	82	626	470		24	**1,202**
Building 54	749	0				**749**
Building 55	392	533			28	**953**
Building 60	0	0		51		**51**
Building 61	0	0		64		**64**
Building 63	0	924				**924**
Building 71	1,117	32			2	**1,151**
Facilities Mgmt. Trans.	0	0			13	**13**
On-Street Parking						
R.B. Brown Drive	7	0				**7**
North Palmer Road	11	7				**18**
East Palmer Road	4	0				**4**
Stone Lake Road	74	0	0			**74**
Entire Campus	**3,525**	**2,436**	**1,120**	**457**	**148**	**7,686**

Figure 3-12: Existing Parking Facility Locations



3.7.3 Pedestrian and Bicycle Facilities

In recent years, interest in alternate travel modes in the Washington, DC metropolitan area has grown. Factors like traffic congestion, increased health and exercise concerns, and environmental stewardship have caused a marked shift in mode share towards pedestrian and bicycle travel. An inventory of facilities at and around NSA Bethesda for use by pedestrians and cyclists was conducted in order to determine their adequacy in terms of installation access and internal maneuverability. This section also serves as the existing condition for the LATR required Pedestrian and Bicycle Impact Statement.

3.7.3.1 Installation Access for Pedestrians and Cyclists

The primary generator of pedestrian and bicycle traffic in the vicinity of NSA Bethesda is the Medical Center Metro station, located on the west side of Rockville Pike across from Gate #2. Transit facilities available at this and other regional transportation hubs are described in further detail in Section 3.7.5. Pedestrians and cyclists traveling to NSA Bethesda from this location can use the existing crosswalks to traverse Rockville Pike before gaining access through the 24-hour Gate #2 and entering the internal roadway network. Furthermore, planned improvements at this intersection include the addition of a pedestrian tunnel beneath Rockville Pike in order to reduce conflicts between vehicles and pedestrians traveling between Medical Center Metro station and NSA Bethesda. Additional information about pedestrian and bicycle facilities along the internal roadway network are discussed in Section 3.7.4.2.

External Shared-Use Trails

Field observations performed at and around NSA Bethesda indicate that there is a population of installation staff that commutes as a pedestrian or cyclist from the surrounding neighborhoods. These users can take advantage of a number of shared-use paths in the vicinity of the installation, including the Bethesda Trolley Trail spur that runs parallel to Rockville Pike along the western edge of NSA Bethesda. This trail, along with other regional shared-use paths and non-auto facilities, are shown in Figure 3-13.

The Bethesda Trolley Trail spur provides connectivity with Rock Creek and the Rock Creek Park trail network to the north as well as with the North Bethesda Trail and downtown Bethesda to the south. To the north, trail users have access to a direct and efficient path between the installation and Kensington and other residential neighborhoods, while southbound travelers from NSA Bethesda can connect to the existing pedestrian network in downtown Bethesda, only a mile away. For a cyclist this trip would take only 5 to 10 minutes from Gate #2, making this connection ideal for local commuters and installation staff.

Figure 3-13: Connectivity to Local Pedestrian and Bike Facilities

Pedestrian Drop-Off and Pick-Up Areas

In addition to gaining access to NSA Bethesda by foot from the local street network or via the Medical Center Metro station, pedestrians also have the option to use two vehicular drop-off and pick-up areas in the vicinity of the installation. As shown in Figure 3-13, there exists a Kiss-and-Ride facility adjacent to the Medical Center Metro station and Gate #2, while to the north of the installation along Cedar Lane there is a drop-off loop adjacent to one of the NIH campus' pedestrian access gates. Both of these facilities provide access to pedestrians who may be members of a carpool or other ride-sharing form of transportation. For bicyclists, there are seven bicycle routes near NSA Bethesda, including the Bethesda Trolley Trail Spur and Jones Bridge Shared-use Path adjacent to the installation and Georgetown Branch Trail, West Cedar Lane Shared-use Path, Rock Creek Trail, Capital Crescent Trail, and North Bethesda Trail serving the North Bethesda region.

Gate Access

It is important to note that not all security gates at NSA Bethesda permit access by non-vehicular users. Access to the installation by pedestrians is only permitted at certain gates, as shown in the schedule below.

- Gate #1 (North Wood Road Gate): 5:00 AM – 7:00 PM
- Gate #2 (South Wood Road Gate): 24 hours
- Gate #3 (Gunnell Road Gate): 5:00 AM – 7:00 PM
- Gate #4 (Grier Road Gate Lodge): No Pedestrian Access (pedestrian access would be added during gate improvements in 2012)
- Gate #5 (University Road Gate): 5:00 AM – 6:00 PM

Because of its proximity to the Medical Center Metro station, Gate #2 sees the majority of pedestrian traffic. Gate #2 is also the primary access point for cyclists because of its proximity to the Bethesda Trolley Trail spur along Rockville Pike. However, traffic coming to the installation from the north may use the non-auto facilities at Gate #1, and traffic coming from the east may access the installation from Gate #5, especially if their destination is the USU, which is very near to this location. Additionally, recent construction programs undertaken by MCDOT include the addition of shared-use paths along Jones Bridge Road and Cedar Lane. These improvements further serve to connect NSA Bethesda to the surrounding neighborhoods and commercial centers.

3.7.3.2 Pedestrian Infrastructure and Use

Aside from bicycling, and the installation's shuttle system, discussed in Section 3.7.4.4, the main method of internal circulation is on foot.

Existing Pedestrian Infrastructure

With the exception of some sidewalk closures in the vicinity of construction zones, the existing sidewalk network at NSA Bethesda is adequate, with curb ramps and other pedestrian amenities present at the vast majority of curb cuts and crosswalks. The current state of pedestrian facilities at NSA Bethesda is shown in Figure 3-14 and the current locations of curb ramps and sidewalks are shown in Figure 3-15. The 2011 NSA Bethesda Accessibility Plan provides recommendations toward improved pedestrian access throughout the installation, including improvements along R.B. Brown Drive, North Palmer Road, and the grade separation between East and South Palmer Roads.

Existing Pedestrian Volumes

In the vicinity of NSA Bethesda, pedestrian traffic volumes vary widely. Pedestrian traffic concentrations can be found along the region's shared-use trails like the Bethesda Trolley Trail spur and near major transportation hubs like the Medical Center Metro station. Additionally, the popularity of downtown Bethesda as a commercial, retail, and dining destination means that high pedestrian volumes were also identified along the southern edge of the installation. Pedestrians were observed crossing east-west at the intersection of Rockville Pike and North Wood Road, which is an intersection without a cross walk. Pedestrian volumes along the external study network can be found in Appendix D, Figures 12A and 12B and reflect the external peak hour time period. Pedestrian volumes counts throughout NSA Bethesda were conducted in combination with the vehicular turning movement counts. For the counts conducted outside of NSA Bethesda, these movements were collected on October 18, 19, 20 and 26, 2011. Those movements collected internal to the installation were collected on 25 October 2011.

Pedestrian conditions within NSA Bethesda internal study network are characterized by high traffic volumes near parking garages, the Medical Center, and USU, and low traffic volumes near ancillary support facilities. Although some pedestrian bridges do exist in the vicinity of the hospital complex, the high number of pedestrians traveling between the hospital and adjacent parking facilities causes a large number of pedestrians attempting to cross the installation's roadways. This leads to delays along R.B. Brown Drive and North Palmer Road, although not to the level shown by the HCM delay calculation procedures (discussed in Section 3.7.2.10). Additionally, pedestrians accessing the installation from the nearby Medical Center Metro station create pedestrian-vehicle conflict areas along South Wood Road and South Palmer Road. During the morning an installation security officer was observed directing traffic in this area to ensure pedestrian safety. Internal pedestrian volumes can be found in Appendix D, Figure 13. Figure 3-14 represents data gathered in 2008 for the BRAC NNMC EIS and additional data gathered in 2012 where construction had taken place since 2008, mostly along North Palmer Road.

Figure 3-14: Installation Pedestrian Facilities – Sidewalk and Buffer Widths

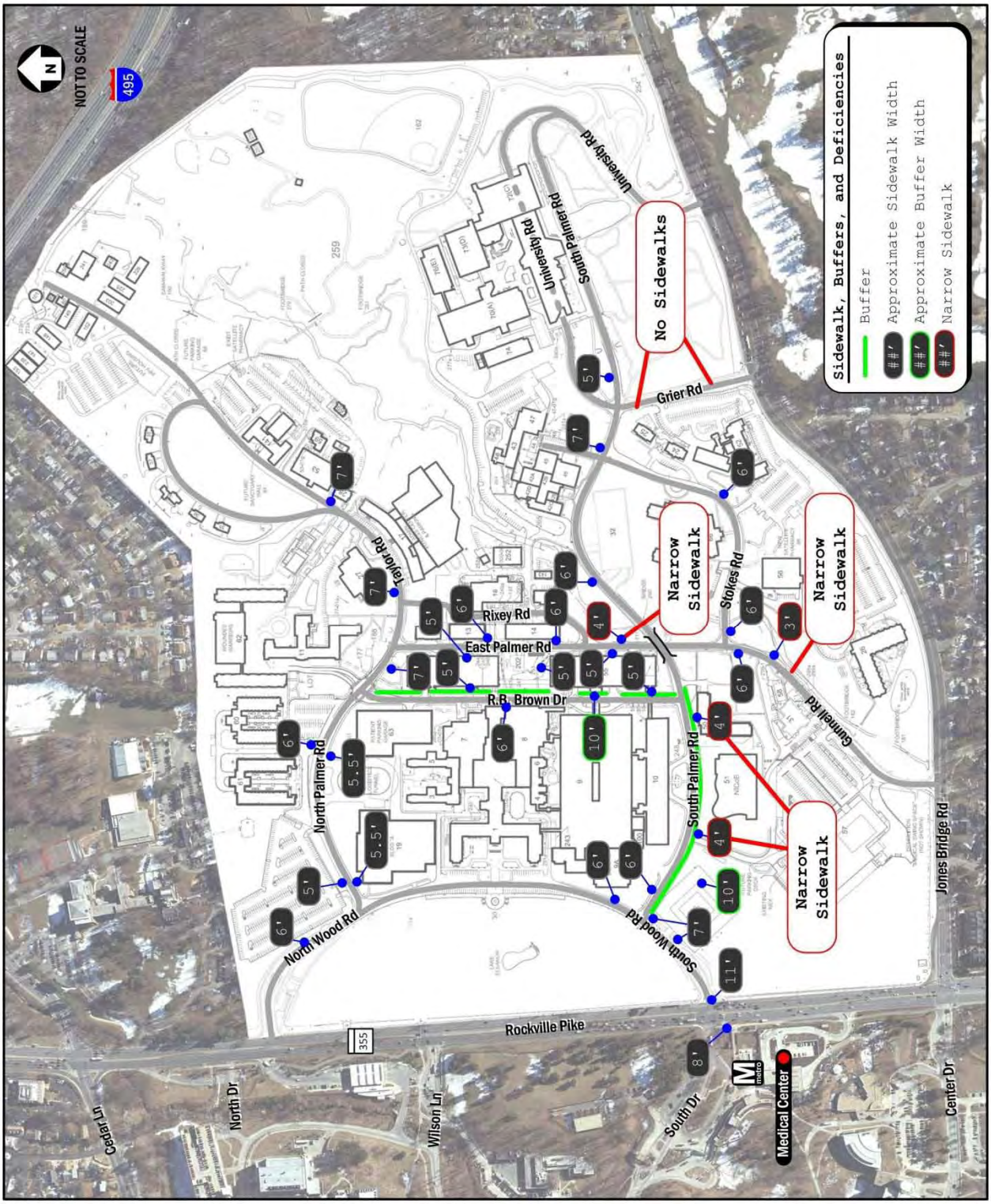
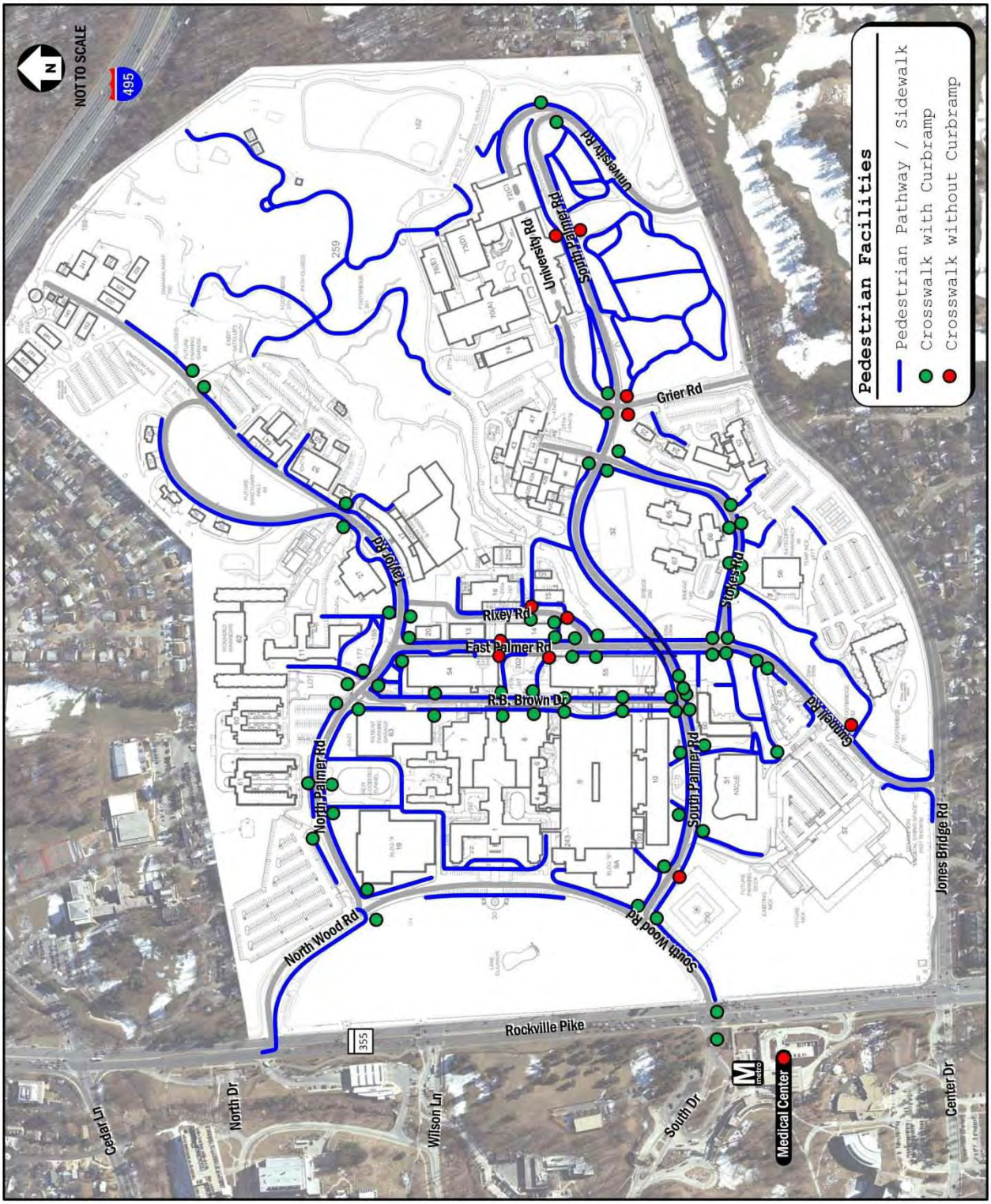


Figure 3-15: Installation Pedestrian Facilities – Curb Ramps and Sidewalk Locations



Bicycle Facilities and Use

The volume of bicycle traffic accessing NSA Bethesda during the study periods is shown in Table 3-22. This section includes a discussion of the provisions for bicycle travel and parking within NSA Bethesda and provides a more thorough breakdown of the volume of cyclists accessing the installation on a daily basis.

Despite the widespread availability of bicycle parking within NSA Bethesda, there is only a minimal number of bicycle travel infrastructure present on the installation. Bicycle lanes exist at the entrances to the installation at Gates #1, #2, and #5 and inside the installation these bike lanes integrate with the vehicular traffic. Furthermore, as documented in Section 3.1.3.2, sidewalk widths within the installation are generally 7 feet or less, rendering these pathways too narrow to serve as shared-use facilities. Therefore, cyclists traveling throughout NSA Bethesda are confined to the roadway network. Although low speed limits along these roads reduce the danger to cyclists, the lack of separated bicycle lanes and the presence of narrow travel lane widths and steep grades in some areas significantly reduce the level of protection afforded to cyclists. Dedicated bicycle lanes would be provided at Gate #4 once construction is complete.

Existing Bicycle Facilities

A number of bicycle racks were observed during visits to the installation. These racks are spread out over a large area within NSA Bethesda. By cutting down the distance between bicycle parking and a cyclist’s eventual destination, the attractiveness of cycling is increased. The number of bicycle storage slots seems to match the demands of their location, for example the USU, Medical facility, and residential areas racks hold more than other locations. Existing bicycle rack locations can be found in Appendix D, Figure 14.

Existing Bicycle Traffic Volumes

Bicycle traffic volumes were collected on 26 October 2011. These volumes, shown in Table 3-22, were further analyzed to develop the bicycle arrival and departure distribution through the security gates as shown in Table 3-22. The total number of bicyclists accessing the installation during the peak periods was 32 vehicles during the AM peak hour and 31 vehicles during the PM peak hour. It should be noted that these counts were conducted in October and therefore likely show lower bicycle traffic volumes than can be expected during the traditional cycling season of April through September. Despite this, the volume of bicycles using the gates is well below the number of bicycles that were observed on NSA Bethesda during field observations, indicating that a number of bicycles are parked on-base for internal trips only. Given the size of NSA Bethesda, some users might desire to keep a bicycle on the installation for non-commuting, internal trip purposes. Additionally, any bicycle trips generated by the on-base

residential population would not be included in the data shown in Table 3-22, potentially explaining the low gate bicycle counts.

Table 3-22: Bicycle Traffic Volumes at Security Gates

		Gate 1	Gate 2	Gate 3	Gate 4	Gate 5	All Gates
Inbound Total	**AM**	13	8	3	0	8	**32**
	PM	0	1	0	0	0	**1**
Outbound Total	**AM**	0	0	0	0	0	**0**
	PM	6	12	6	3	3	**30**
All Traffic	**AM**	13	8	3	0	8	**32**
	PM	6	13	6	3	3	**31**

3.7.4 Availability of Transit

A number of transit services are provided in the vicinity of NSA Bethesda. Within the vicinity of the installation, service is provided by WMATA, Montgomery County's Ride On bus system, the Bethesda Circulator, and the Maryland Area Regional Commuter (MARC) operated by the Maryland Transit Administration. NSA Bethesda also operates a number of shuttles that serve the internal installation network as well as the Medical Center and Silver Spring Metrorail stations. Figure 3-16 shows these transit services.

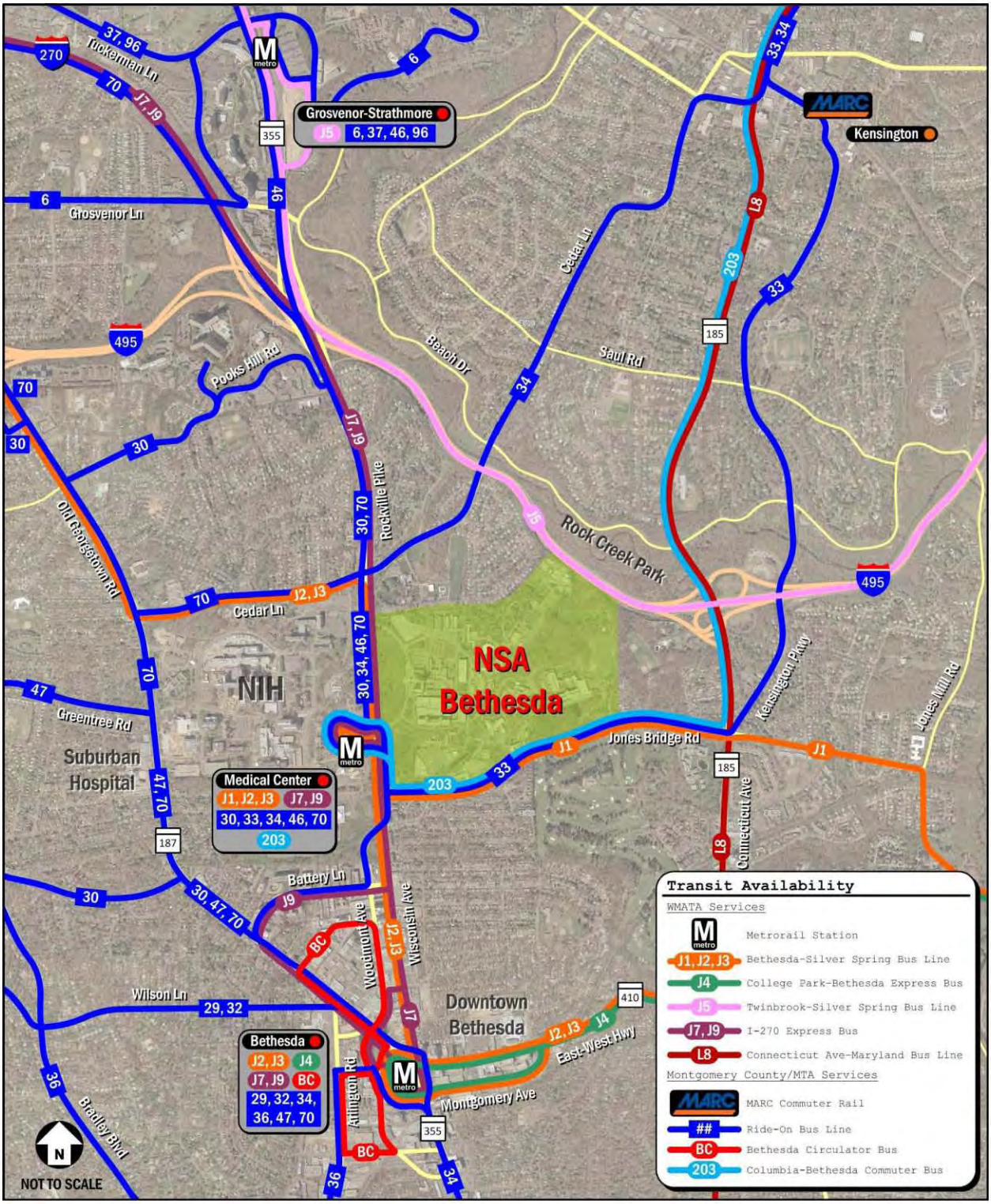
3.7.4.1 WMATA Transit Services

NSA Bethesda is located across Rockville Pike from the Medical Center Metro station on the Metrorail Red Line, a transit rail service providing connection to downtown Washington and other regional destinations through an 86-station network. Like many Metro stations, the Medical Center is home to a surface transit center as well that serves as a major stop and transfer hub for several WMATA and Montgomery County Ride On bus services.

This station opens at 5:00 AM on weekdays and at 7:00 AM on weekends; it closes at 12:30 AM from Sunday through Thursday and at 3:30 AM on Friday and Saturday. The trains operate with headways of 3 to 6 minutes during the peak weekday morning and afternoon periods, and with headways of 6 to 15 minutes during the weekday off-peak periods.

According to the last full study published by WMATA in 2006, the average number of weekday entries at this station is 5,255. On average there are 425 entries and 1,040 exits in the AM peak hour and 920 entries and 270 exits during the PM peak hour, respectively.

Figure 3-16: Local Public Transit Availability



A number of WMATA Metro bus routes also pass through the study area, including two routes that stop at the Medical Center Metro station:

Bethesda-Silver Spring Line (Routes J1, J2, and J3)

- Route J1 provides rush hour only service between the Silver Spring and the Medical Center Metro station via Jones Bridge Road with 30 minute headways. Routes J2 and J3 routes offer through service between the Silver Spring Metrorail station and Montgomery Mall to the northwest of NSA Bethesda with intermediate stops in the Bethesda CBD and at the Medical Center Metro station. These routes operate with 7-minute headways during peak hours and 20-minute headways during off-peak hours.

I-270 Express (Routes J7 and J9)

- Routes J7 and J9 comprise the I-270 Express, running between the Lakeforest Transit Center in Gaithersburg and the Bethesda Metrorail station. The only difference between the two routes is the paths taken through downtown Bethesda and Gaithersburg. The J9 bus provides service in the peak commuter direction at 10 to 20 minute headways during the peak hour and the J7 bus provides limited-stop service in the opposite direction at 20 to 30 minute headways.

3.7.4.2 Maryland Transit Administration Services

Commuter rail service is available through the MARC Brunswick Line, providing service between Union Station in downtown Washington and Martinsburg, West Virginia, or Frederick, Maryland, depending on the route. MARC runs 9 trains inbound to Washington in the morning and 10 trains outbound in the evening. All trains stop in Rockville about 6 miles to the north of NSA Bethesda, where a connection can be made to the Metrorail Red Line. An additional stop is located at Kensington, approximately 3 miles northeast of the installation.

Maryland Transit Administration also operates several commuter bus lines that utilize the new Intercounty Connector (MD 200) that travels east-west across Montgomery and Prince George’s counties. One of these routes, the Maryland Transit Administration 203 Commuter Bus – Columbia to Bethesda, began operation on 3 January 2012 between the Snowden River Park and Ride in Columbia and the Medical Center Metro station adjacent to NSA Bethesda via US 29, Intercounty Connector, and Connecticut Avenue.

3.7.4.3 Montgomery County Ride On Bus Services

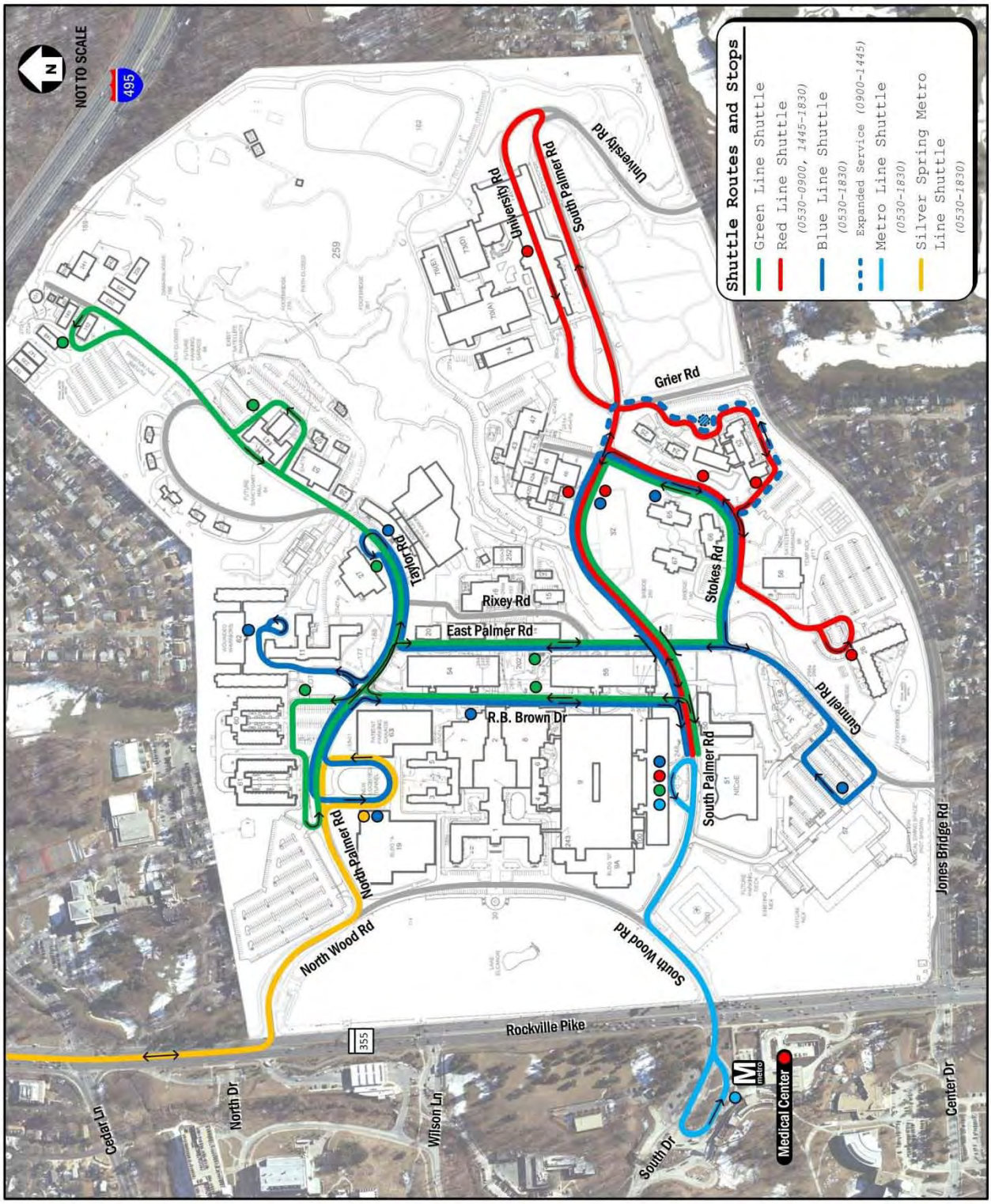
Montgomery County operates the Ride On bus system, which provides service along most major roadways within the county. Five Ride On routes serve the Medical Center Metro station:

- Bethesda – Medical Center (Route 30): Route 30 is a local collector route that circles through the neighborhoods around the NIH campus before terminating at the Bethesda Metro Station. The service operates Monday to Friday at 30-minute headways.
- Glenmont – Medical Center (Route 33): Route 33 provides rush hour-only service to the Glenmont Metro station at 30-minute intervals via Kensington Parkway and the Kensington MARC station.
- Aspen Hill – Friendship Heights (Route 34): Route 34 provides service from Wheaton to Friendship Heights via downtown Bethesda and Wisconsin Avenue at 15-minute headways on weekdays and 30-minute headways on weekends.
- Rockville – Rockville Pike – Medical Center (Route 46): Route 46 connects NSA Bethesda with Rockville via Rockville Pike and primarily serves as a feeder to the Metro stations along this route. Weekday service provides 15-minute headways during the day and 30-minute headways in the evening. This route also provides service on weekends at less frequent intervals.
- Germantown – Bethesda EXPRESS (Route 70): Route 70 is an express service running between the Germantown Milestone park-and-ride lot and Bethesda. The bus provides limited-stop service between the Medical Center Metro station and these locations with service every 12 minutes.

3.7.4.4 NSA Bethesda Shuttle Services

NSA Bethesda operates five shuttle bus lines. Three color-coded shuttle lines operate within the installation, with two lines providing connections to external destinations. The Metro Line Shuttle provides service between the Medical Center Metro station and Building 10 of the installation. At Building 10, a transfer can be made to the three internal lines. Similarly, Silver Spring Metro Line Shuttle provides service every 15 minutes to the Silver Spring Metro station, with a transfer provided to the Blue Line Shuttle at the America Building. The two external lines are Patient Shuttles that give priority patients and visitors of patients of NSA Bethesda, with installation staff allowed to ride as space permits. Figure 3-17 shows the NSA Bethesda shuttle service, along with all bus stops and each line’s hours of operation.

Figure 3-17: NSA Bethesda Shuttle Routes and Stops



3.8 Cultural Resources

The affected environment for cultural resources includes the entire 243-acre installation plus any adjacent off-base resources on or eligible for NRHP listing that may be impacted by development or operations at NSA Bethesda.

Eligibility for NRHP is established according to the official Criteria for Evaluation issued by the Department of the Interior. In broad terms, evaluation criteria are based on the following factors – the quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

(a) are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) are associated with the lives of persons significant in our past; or
(c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) have yielded or may be likely to yield, information important in prehistory or history.

The information immediately below is largely excerpted from the October 2002 *National Naval Medical Center, Bethesda, Maryland Integrated Cultural Resource Management Plan (*NNMC, 2002*)* and the subsequent May 2009 *National Naval Medical Center Integrated Cultural Resource Management Plan (2009-2013)* (NNMC, 2009). Due to the on-going construction at what is now NSA Bethesda, it has been updated, where necessary, by personal communication with NSA Bethesda Facilities Management personnel.

3.8.1 Prehistoric and Historic Background

The 12,000 years of human occupation of northeastern North America prior to the sustained arrival of the Europeans began in 10,000 Before Common Era (B.C.E.) with the Paleo-Indian Period characterized by hunter/gatherers living in seasonal camps near streams and other sources of fresh water. In the Archaic Period, from 8,000 to 1,000 B.C.E., subsistence from hunting and gathering may have been supplemented by horticulture toward the later part of the period as seasonal villages began to appear. The Woodland Period, which occurs after 1,000 B.C.E., was marked by the appearance of ceramics as American Indians continued to live in seasonal campsites and villages and subsist through hunting, gathering, and horticulture.

Limited investigations indicate that human activity at what became NSA Bethesda occurred from the Early Archaic to the Early Woodland periods. Pottery and artifacts from around 3,000 B.C.E. have been

found at a site on the nearby NIH property. Three locations at NSA Bethesda have yielded groupings of prehistoric artifacts; other "isolates" have been found. It is believed by archaeologists that Native American families may have camped along tributary streams such as in the Stoney Creek Watershed in the autumn and winter during their seasonal migration for subsistence.

The European American history of the site began in 1715 when Thomas Fletchall purchased the property that would become home to the future NSA Bethesda. The location of the property along the road between Georgetown and Rockville tied it into the developing economic network of the region. The property continued to be used for farming through the early 20th century despite the growth of the villages and towns connected by the Rockville Pike.

In the 1930s, the Roosevelt Administration, and President Franklin D. Roosevelt himself (a former Assistant Secretary of the Navy), began to look into the state of medical care for naval personnel in the United States. Legislation passed by Congress in 1930 to improve naval medical care did not immediately lead to the construction of new facilities. Many functions continued to be housed in buildings at the Old Naval Observatory at 23rd and E Streets N.W. in Washington. In 1937 Congress specifically authorized and funded the construction of a new naval medical complex, but a new site had to be selected. By this time, the requirements were not just for a medical school and hospital of the highest quality, but also for the Naval Dental School, the Naval Medical Research Institute, a Hospital Corps School for the Women Accepted for Volunteer Emergency Services, and facilities for various occupational and recreational activities. Residential and support facilities for doctors, nurses, and corpsmen were also needed.

President Roosevelt assumed an active role in both the conceptual design and the site selection for the complex. In 1937, Roosevelt, impressed by the modernist design of the 1924 Nebraska State Capitol designed by Bertram Goodhue, sketched out a rough sketch on White House stationary of a plan and elevation for a building of similar architectural character. When the selection of a site for the new naval medical center bogged down in controversy, Roosevelt invested his own time visiting many potential sites and made the selection of the Bethesda farmstead himself. The realization of Roosevelt's design idea was assigned to the Navy's Bureau of Yards and Docks. The execution of the design was supervised by the distinguished consulting architect Paul Philippe Cret working in cooperation with Frederick Southworth of the Bureau of Yards and Docks. The scale of the central building increased but followed Roosevelt's basic plan. The core complex of buildings was built between 1939 and 1941 and dedicated by President Roosevelt on 31 August 1942.

Over time the Bethesda complex acquired new tenant commands, often geared to the particular requirements of military medicine. The Naval School of Hospital Administration, the Naval Toxicology Unit, and AFRRI were among them. One example of the focus on medical care that

related to the circumstances of naval service is the research carried out at the Naval Medical Research Institute on decompression, making use of hyperbaric chambers. In 1973, the hospital and the tenant commands were combined in one organizational structure called the NNMC. Also during this period, a single armed services medical school, the USU was built at the southeastern corner of the NNMC property.

The historic significance of NNMC lies in many areas. First, it has provided care to thousands of American service personnel over a 60-year period stretching from World War II through the Korean Conflict, the Vietnam War, and today's wars in Iraq and Afghanistan. It has also served as the "hospital of Presidents," and maintains a medical suite for the President of the United States in the Central Tower Block. Research carried out at the former NNMC has contributed to many medical achievements such as blood vessel and bone grafting techniques, radioactive treatment of tumors, the acrylic eye, and improved prostheses. NNMC's many accomplishments in the practice of military medicine were diffused throughout the DoD health care system.

As noted in Section 1.1, one result of the 2005 BRAC Law was a decision to close the WRAMC installation in Washington, DC and merge its functions with NNMC to create a new WRNMMC at Bethesda. Planning for BRAC implementation and other related projects has generated many major new construction projects, some of which have resulted in the loss of certain NRHP eligible buildings, such as Building 12, designed by Paul Cret. However, both the Navy and reviewing authorities including MHT and NCPC have given careful attention to preserving the integrity and setting of the iconic Central Tower Block, Building 1.

The Bethesda installation remains a Navy property for base management purposes; these functions are carried out by an entity known as NSA Bethesda while WRNMMC has the status of its principal tenant. For simplicity, the term NSA Bethesda is used below in this section.

3.8.2 Status of Cultural Resource Inventories and Section 106 Consultations

NSA Bethesda is in compliance with the mandate of Section 110 of the NHPA to survey, inventory, and evaluate NRHP eligibility for all cultural resources under its control. This has been accomplished through cultural resources surveys carried out by professionally qualified consultants, whose conclusions, once endorsed by the Navy, have been reviewed and confirmed by MHT. Section 106 of NHPA, as set out in the procedures of 36 CFR Part 800, requires that Federal agencies such as the Navy/NSA Bethesda take into account the effect of any undertaking upon NRHP eligible resources and allow ACHP a reasonable opportunity to comment upon the adequacy of that consideration. As with NEPA, the obligation of the Federal agency under NHPA is one of taking into account and incorporating into its project planning certain values, such as historic preservation. However, the Federal agency retains the final decision in balancing these values with its mission imperatives.

NCPC is also a participant in Federal development projects in the NCR. NCPC coordinates the development activities of Federal and local government agencies in the NCR. Specific to the proposed actions, early in the EIS process, the Navy initiated informal consultation with MHT, NCPC, and ACHP to ensure effective collaboration and communication. ACHP has responded that, based on the documentation provided by the Navy in the early consultation invitation letter dated 17 October 2011, and the presentation during the 10 November 2011 meeting with MHT, NCPC, and ACHP at NSA Bethesda, the agency believes that its participation is not warranted at this stage (ACHP, 2011).

3.8.3 Built Environment

3.8.3.1 Overview

The 243-acre NSA Bethesda installation contains, as of late 2011, approximately 106 buildings. Of these, 17 structures and one landscape feature are either listed on or eligible for the NRHP. The centerpiece is the iconic Central Tower Block (Building 1) and its setting as viewed from Rockville Pike. The other buildings, mostly of a similar style, and the landscape feature that were not displaced or radically altered by later construction are contributing to a NRHP eligible historic district designated in 1998.

The historical pattern of development has been determined by several factors:

1. the prominence of the original Central Tower Block (Building 1) with its 20-story tower and flanking pavilions on a rise of land overlooking a semi-elliptical greensward sloping down to Rockville Pike;

2. the logical arrangement of additional buildings to the rear and then to the north and south of Building 1;

3. the supplementary access provided by Jones Bridge Road along the southern perimeter (the only other border not blocked by private property);

4. the less buildable uneven terrain of the rear or eastern half of the installation due to Stoney Creek and its drainage system; and

5. the increasing demand for built space at an installation with limited buildable land, coupled with a change in technology (air conditioning, notably) that eliminated the need for a hospital layout of isolated wings and created a dense complex of new buildings adjoining the core on all but the western sides.

3.8.3.2 Documentation and Surveys

Since the passage of NHPA in 1966, the standards for documenting NRHP eligible resources have become more professional and systematic. The history of cultural resource surveys at NSA Bethesda reflects this

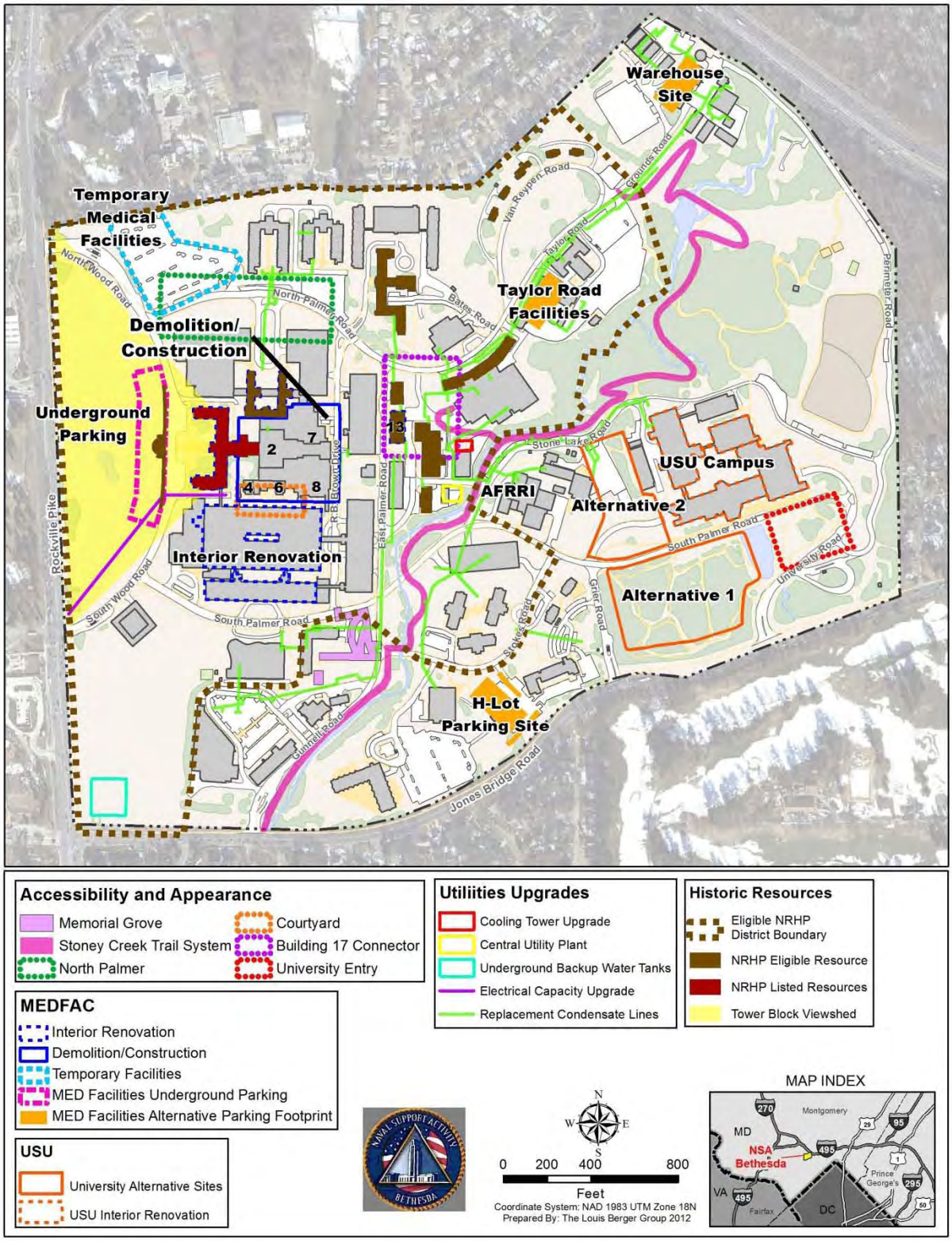
evolution in that it began with an NRHP nomination of the installation's major landmark, the Central Tower Block, in 1975 and only achieved a systematic evaluation of NRHP eligibility of all buildings and structures in 1998. Because of the general rule that resources must be at least 50 years old to qualify for eligibility unless they are of outstanding significance, 100 percent completion in buildings surveyed is necessarily a moving target.

As indicated above, the first action to comply with NHPA Section 110 survey requirements for NSA Bethesda was the drafting of a nomination to NRHP of the Central Tower Block, also known as Building 1, by Chesapeake Division, Naval Facilities Engineering Command. The NRHP form referenced architecture, science, military, and education as "areas of significance" and gave the dates of 1939 to 1942. It was accepted for listing on the NRHP in March 1977.

In 1998 a comprehensive survey, prepared by Baker Associates, documents the architectural development of the medical complex during the period 1940 to 1945 and proposed a 131-acre historic district. Since the recent demolition of Buildings 12, 18, and 21, the NNMC Historic District contains 17 buildings and one landscape feature, (the lawn between Building 1 and Rockville Pike) that are deemed contributing. Others within the district are non-contributing. The survey indicates that the district is eligible for NRHP listing under Categories A, B, and C, and particularly for its association with Franklin D. Roosevelt and Paul Philippe Cret. The historic district was accepted as NRHP eligible by a consensus determination between the Navy and MHT.

Figure 3-18 shows NSA Bethesda's historic properties (as of 2011) with reference to the projects addressed in this EIS. As is evident from the figure, the Medical Facilities Development has the potential to affect the historic integrity of the Central Tower Block and Buildings 3 and 5. The construction of an associated underground parking structure below the Front Lawn has the potential to affect that landscape as well as the setting of Building 1. Neither alternative location for the University Expansion is within the Bethesda Historic District. Certain utility up-grades are to take place within the historic district. An evaluation of the effects of all projects addressed in the EIS on historic properties is given in Chapter 4.

Figure 3-18: Historic Resources at NSA Bethesda



The enormous changes that occurred because of BRAC and other construction projects at NSA Bethesda greatly altered the density and spatial organization of the installation. The boundaries of the NNMC Bethesda Historic District, drawn 13 years ago, no longer represent a coherent grouping of Cret era buildings. Although multiple historic contexts were identified, the selection of the buildings to be included within the 1998 historic district boundary was overwhelmingly based on the architectural significance of Paul Cret's buildings and their offshoots in a similar style. An exception was the inclusion of the Flag Officers Row built in a uniform Colonial Revival style.

The most recent buildings at NSA Bethesda to be determined eligible for NRHP listing are the interconnected complex of Buildings 42 through 48, which form AFRRI. AFRRI is located centrally within the installation but outside the Historic District. Although the complex dates from an extended construction period of 1962 to 1988, its outstanding record of research and accomplishment in the medical applications of radiobiology and the unique design of the TRIGA Mark F "pulsing" reactor that it houses qualify it under Criteria A and C respectively for NRHP listing. A Determination of Eligibility (DOE) for AFRRI submitted by the Navy was concurred to by MHT in January, 2012. However, it was also determined that it did not warrant an extension of the Historic District, as AFRRI's period of significance is later than that of the Historic District; nor does AFRRI share its Art Deco architectural design (MHT, 2012).

3.8.4 Archaeology

In general, the potential for archaeological resources at NSA Bethesda has been limited by the extensive ground disturbance from farming prior to Navy acquisition and coverage in hardstand and buildings, especially in the western, more developed section of the installation. In the northeast area of the installation, the low rising landforms above the streambed of Stoney Creek have a greater potential for archaeology. The 2009 Integrated Cultural Resources Management Plan (ICRMP) recommended that a Phase IA Reconnaissance Study be carried out, which would identify areas of low and high probability for archaeological resources for the entire installation. In the absence of such a document, NSA Bethesda has relied upon smaller area Phase I Intensive investigations for either potential project sites, if warranted, or areas of general scientific interest. Most of the redevelopment of NSA Bethesda has taken place in locations that were self-evidently disturbed by prior periods of construction.

Certain professional archaeological surveys have been undertaken, largely limited to the immediate watershed of the Stoney Creek tributary where the potential for significant sites existed.

The locations of the Medical Facilities Development and all alternatives for its associated parking do not fall within any known zone of archaeological sensitivity, as established by the existing survey record in MHT files.

In 2007, Elisabeth Comer carried out a Phase I Archaeological Survey of areas south and west of the USU campus. The survey identified various prehistoric sites, but by an 18 April 2007 letter, MHT determined that none of the sites warranted further work, (i.e., a Phase II investigation) to determine if they were eligible for the NRHP (NNMC, 2009). So the University Expansion would not take place in an area of archaeological sensitivity.

It is Navy policy, in keeping with NHPA, to restrict access to information on the location and nature of archaeological sites to avoid facilitating vandalism. Therefore, no figure is included with the location of these sites.

3.8.5 Native American Resources/Sacred Sites

There are no federally recognized Indian tribes present in Maryland. To date, no traditional cultural properties or American Indian sacred sites have been recorded at NSA Bethesda. The current NSA Bethesda ICRMP contains a complete list of laws and procedures relating to American Indian patrimony, which would be implemented in the event of an unanticipated discovery (NNMC, 2009).

3.9 Land Use and Zoning

3.9.1 Geographic Setting and Adjacent Land Uses

NSA Bethesda is located in Bethesda, Maryland, just outside of Washington, DC, in Montgomery County, Maryland. Its approximately 106 buildings have served a wide variety of functions, from NSA Bethesda's primary mission of providing medical care, to research and development, and to buildings associated with the physical plant, community services, education, and residences, both temporary and long-term (Pers. Comm., Cary, 2011).

NSA Bethesda is surrounded by properties with diverse land uses. NIH is located to the west of the installation, on the west side of Rockville Pike (MD 355). NSA Bethesda is bounded to the east by the Capital Beltway (I-495) as well as North Chevy Chase Park, and to the south by the Columbia Country Club. The Stone Ridge School of the Sacred Heart lies north of NSA Bethesda, between the installation and Cedar Lane. The remaining land uses surrounding NSA Bethesda are characterized primarily by single family, suburban development.

3.9.2 Installation Land Uses

The 2008 NNMC Master Plan provided land use recommendations for functional zones in NSA Bethesda. These land use recommendations include Medical; Administration; Permanent Party Housing; Community Services/Morale, Welfare, and Recreation; Research; Education; Transient Housing; and Maintenance functional zones (NAVFAC, 2008a).

The primary focal point looking east to NSA Bethesda from Rockville Pike is the historic tower (Building 1) that serves as the central hub

of the medical facilities at NSA Bethesda. The medical facilities are located just east of the main lawn, with permanent party housing to the north, and administration and community service facilities such as the current Navy Exchange located to the south. The maintenance facilities are located directly east of the medical area, with more administrative facilities due north. The research area is located east of the maintenance facilities and bordered to the south by transient housing, such as the Navy Lodge and Fisher House™. The eastern part of the installation is occupied by USU and ball fields, with another maintenance area located in the northeast corner.

The USU main campus is situated in the eastern portion of the installation in the educational functional zone. It is located between South Palmer Road and Stone Lake Road, which runs parallel and adjacent to Stoney Creek. AFRRI, which is affiliated with USU through a graduate program in radiation biology, has a multi-building complex located directly west of the campus. Forested areas border the USU campus to the north and south and recreational fields are located directly east.

3.9.3 Aesthetics and Visual Resources

Studies of visual perception have shown that factors such as visual character, visual compatibility, and viewer sensitivity can be used as measures to determine impact significance. Visual character can be defined as landscapes composed with a distinctive variety of form, line, color, and/or texture. Visual compatibility (or incompatibility) is determined by the degree to which the introduction of an anomalous structure or element into the visual landscape blends in or is compatible with the existing landscape. Proximity and relative scale are factors used in defining compatibility.

The level of significance of modification to a viewshed is further defined by viewer sensitivity. Viewer sensitivity is a non-economic measure of public concern for scenic quality. It is a measure of the changes in the expectation of viewers and the relative importance of viewsheds to those who have views of a particular site. Examples would include those living in an area with a view of a project, people traveling through an area that includes views of a project, and/or recreational or other use areas that may provide views of a project. The level of sensitivity is determined by the number of viewers of a particular viewpoint, the length of time the viewer may see the viewshed, and the proximity of relative scale of predominance of project elements within that viewshed. For the purposes of this analysis, the region of influence (ROI) would consist of the entire installation and the views from those properties bordering the installation.

As discussed, the installation is bordered on the northeast by the Capital Beltway (I-495), on the east by a county park and a historic residential neighborhood, on the south by a golf course and a residential neighborhood, to the west by the NIH campus, and to the

north by a private girl's school and a residential community. The installation itself comprises approximately 106 buildings that function for patient care, medical research, educational facilities, and residential areas. The installation includes a Historic District composed of 17 of the installation's buildings and the landscape area and entry drive directly in front of Building 1 (NAVFAC, 2010a).

The selected sites for the proposed Medical Facilities Development and University Expansion would have externally visible activities at dispersed locations throughout NSA Bethesda, as discussed in the sections that follow.

3.9.3.1 Medical Facilities Development

Building C – Construction and Demolition

This proposed site for demolition and reconstruction of several buildings is located directly behind the Building 1 tower and includes the area that is presently occupied by Buildings 2, 4, 6, 7, and 8. The highly developed area is characterized by hardscapes and buildings in the streamlined Art Deco style (NAVFAC, 2010a). There are no significant views to or from these buildings, as they are surrounded by other buildings that obstruct any views to and from these buildings.

Parking Alternatives

Underground Parking - This proposed project site is located directly to the west of the Building 1 tower and is characterized by the formal lawn sloping up from Rockville Pike towards the Building 1 tower. This site is within the historically significant viewshed associated with the Building 1 tower. The site is also within the direct sightline of the views of the lawn from Rockville Pike looking towards the Building 1 tower (NAVFAC, 2010a).

Warehouse Site – This proposed Medical Facilities Development alternative parking site is located in the northeast corner of the installation with a bordering residential neighborhood located immediately to the north and I-495 to the northeast (Figure 3-19). The site is characterized by 1 to 2-story metal industrial and maintenance storage buildings, paved hardscape, and small grassy areas. There is a black chain link and tarp fence and mixed hardwood buffer to the north of the site and a black chain link fence buffer to the northeast.

There are no significant historic, architectural, or landscape views of or in this site (see Figure 3-20) (NAVFAC, 2010a). In addition, the specific footprint of the alternative parking site is set back from the tree and fence line that borders the neighborhood to the north.

Figure 3-19: Buffer along Northern Boundary between Residential Community and Proposed Warehouse Medical Facilities Parking Site looking Northwest

Figure 3-20: View from Northern Boundary with Community Looking Southeast Towards Proposed Warehouse Medical Facilities Parking Site

H-Lot Site - The proposed H-Lot Medical Facilities alternative parking site is located adjacent to Buildings 52 and 56 on what is at present

a paved parking area. The site is characterized by hardscape and grass mix as well as a thick stand of mixed hardwood trees and shrubs to the south of the site acting as a buffer to Jones Bridge Road. Buildings in the immediate vicinity are of the Contemporary Brick style, such as the Navy Lodge, a 5-story concreted framed building clad in several colors of bricks with punched windows. There are no significant historic, architectural, or landscape viewsheds of or originating from the proposed site (NAVFAC, 2010a).

Taylor Road Facilities - The proposed Medical Facilities alternative parking site on Taylor Road is currently occupied by Buildings 28, 53, and 59, all of which range between 1 and 2 stories, and is surrounded by several other buildings also in the Art Deco style as well as a mixed hardwood stand to the east. There are no significant historic, architectural, or landscape views originating at the site, although the site is within the eligible NNMC Historic District boundary (NAVFAC, 2010a).

Temporary Medical Facilities

The site where the proposed temporary medical facilities would be located in the northwest corner of the installation is currently occupied by G-Lot and bordered by Building 61 to the east, Building 19 to the south, the historic Front Lawn area to the southwest, and a private girl's school beyond the northern border. To the west, the site slopes downhill towards Rockville Pike. The site is characterized by paved hardscape, and mix of Art Deco and Contemporary Brick style 4 to 5-story buildings east of the site. A black chain link fence and a row of mixed hardwoods and conifers border the site to the north, providing a minimal buffer with the adjacent private girl's school (FIGURE 3-21). There are no significant historic, architectural, or landscape views within the site; however, the site is within the eligible NNMC Historic District boundary (NAVFAC, 2010a).

Figure 3-21: Buffer along Northern Boundary between Stone Ridge School and Proposed Temporary Medical Facilities Site Looking Northeast

University Expansion

The University campus is composed of approximately six buildings in the contemporary brick style. The campus is bordered by a large stand of mixed hardwoods to the south (Alternative Site 1), parking lot and other buildings to the west (Alternative Site 2), a smaller stand of mixed hardwoods to the north, and recreational ball fields to the northeast (Figure 3-22 and Figure 3-23).

There are several significant landscape views associated with the University campus including two from Jones Bridge Road looking north towards the campus, one looking north from the campus towards the forested area, and one looking southeast from the southeast corner of the campus (NAVFAC, 2010a)

Figure 3-22: View of Buffer along the Southern Boundary between University Campus and Private Country Club and Neighborhoods on Jones Bridge Road Looking Southwest

Figure 3-23: Buffer along the Southern Boundary between the University Campus and Jones Bridge Road Looking West

3.9.4 Relevant Plans, Policies, and Land Use Regulations

3.9.4.1 History of NSA Bethesda's Planning Process

In 2008, a master plan was prepared to address the anticipated development associated with the BRAC 2005 relocation requirements. Additionally, a TMP and an IAP were also prepared; these are discussed in detail in the following subsections.

The 2008 NNMC Master Plan also addresses Alternative 1 of the USU Expansion and states that maintaining and enhancing open area green spaces should continue to be a priority concept and that the natural spaces created by the creek and the forested areas should be integrated into the campus plan. Both the 2010 Comprehensive Master Plan for the NCR and the 2011 WRNMMC Medical Facilities Master Plan provided framework for the Medical Facilities Development. Furthermore, the 2011 NSA Bethesda Accessibility Plan developed a strategy for implementing universal accessibility at NSA Bethesda, and provided recommendations for establishing accessible routes and zones within the campus.

As discussed in detail in Section 1.3.1 and below, two master plans specific to the medical facilities were prepared to fulfill the NDAA 2010 requirements - a CMP for the NCR as well as the Medical Facilities Master Plan specific to WRNMMC. These master plans address the requirements to meet world class standards at the medical facilities. These requirements were identified subsequent to the programming for BRAC 2005, which was specifically designed to accommodate the transfer of WRAMC to WRNMMC. Specific to NSA Bethesda, the WRNMMC Medical Facilities Master Plan provides a long-range plan subsequent to BRAC 2005 construction and identifies facility, infrastructure, and technology requirements to achieve the goals of a world class academic medical facility, including the current military space standards (NAVFAC, 2011a). The WRNMMC Medical Facilities Master Plan provides the framework for the proposed Medical Facilities Development.

As the BRAC relocation was completed in Fall 2011, an update to NSA Bethesda's Master Plan was underway to provide an installation-wide framework for physical development that covers all tenants and facilities, including the proposed Medical Facilities Development and University Expansion. This update, the 2012 NSA Bethesda Master Plan, would bring the installation more in line with the Regionally Integrated Master Program (RIMP) 2.0 Model Base Plan, and the Naval District Washington's (NDW) 2035 vision (NAVFAC, 2011d). This update is needed to ensure that anticipated changes such as the proposed Medical Facilities Development and University Expansion, as well as other developments, adhere to consistent and appropriate physical appearance and functions and integrate the requirements of the installation tenants in their pursuit of excellence in patient care, medical research, and education (NAVFAC, 2011d). An update to the previous TMP is also underway.

In addition to allowing the tenants of the installation to provide input on the planning process, the master planning update process examines strategies for accommodating planned and potential growth, increasing the efficiency of the installation, and improving support for the primary missions (healthcare delivery and medical education), as well as provisions of other supporting functions such as commissary, financial, logistics and transportation facilities, and recreation support activities.

3.9.4.2 Installation Plans, Policies, and Land Use Regulations

NSA Bethesda has several policies, plans, or land use regulations that address land uses across NSA Bethesda. Six plans specifically address land uses: the DoD's Comprehensive Master Plan for the National Capital Region Medical, WRNNMC Medical Facilities Master Plan, the 2008 TMP, the 2008 NNMC Master Plan Update, the 2010 IAP, and the 2011 NSA Bethesda Accessibility Plan. These plans and their specific policies, plans, or regulations related to land use are discussed below.

2010 Comprehensive Master Plan for the National Capital Region Medical and 2011 WRNMMC Medical Facilities Master Plan

To fulfill the NDAA 2010 requirements, JTF CapMed completed a CMP to address the improvement requirements and recommendations for the treatment and prevention of disease and injury, promotion of health, and the delivery of health care to DoD beneficiaries (DoD, 2010).

Under the same mandate, JTF CapMed also completed the WRNMMC Medical Facilities Master Plan to provide a long-range plan subsequent to the BRAC 2005 action that identifies facility, infrastructure, and technology requirements to achieve the goals of a world class academic medical facility, including the current military space standards (DoD, 2010). These two plans provided the framework for the Medical Facilities Development proposed in this EIS.

Additionally, two principles for allocating land uses were identified in this plan. The first principle states that WRNMMC would be integrated with the existing development at NSA Bethesda. A primary objective of this principle finds that future land uses of WRNMMC should substantially comply with the Facilities Master Plan for NSA Bethesda and the neighborhood area plans for the District of Columbia. The second principle states that WRNMMC should respect the historic fabric of the site as defined by the NRHP for buildings and contributing structures. This principle seeks to maintain Building 1 as an iconic structure at the WRNMMC site and states that its architectural presence should continue to dominate the views of the site from all public vantage points (DoD, 2010).

NNMC Master Plan

The goal of the 1990 NNMC Master Plan was to stabilize patient care operations and provide increased access to patient services. As a result of the requirements of the 2005 BRAC Law there was a tremendous expansion of services at WRNMMC. The 2008 Master Plan update provided a logical basis and a framework for anticipated development throughout the installation considering existing constraints and opportunities (NAVFAC, 2008). The overriding planning objectives in the development of the Master Plan Update were as follows:

- support the medical mission;
- provide flexibility to meet future change;
- consider aspects of security;
- maintain/enhance the built and natural environment;
- preserve historic and natural resources;
- develop a walkable campus; and
- promote compatibility with surrounding neighbors.

In terms of functional relationships between land uses on the campus, the division of land uses remains essentially the same between the 1990 Master Plan and the 2008 Master Plan Update. The 2008 Master Plan determined that the massing and structural organization of the installation should remain focused on Building 1, the historical tower that is the central element and most recognized feature of the entire installation. In addition to this, the plan determined that any proposed construction must maintain the importance and significance of this feature. Furthermore, the update found that the loop around the medical core of Buildings 1 through 10 is an organizing feature of the installation that should be maintained. Additionally, the 2008 Master Plan states that development in the southeast portion of the installation should focus on requirements anticipated for growth related to USU (NAVFAC, 2008a). The 2012 NSA Bethesda Master Plan reflects continuation of the 2008 Master Plan goals and objectives to cover the entire installation in the post-BRAC conditions.

The 2008 Master Plan further determined that maintaining and enhancing open area green spaces should continue to be a priority concept and that the natural spaces created by the creek and the forested areas should be integrated into the installation plan. The update also emphasizes enhancement of strong pedestrian links, focusing on pockets of green space within the built environment. In addition, the plan update determined that recreational land uses along the east side of the campus should continue because they take advantage of the natural resources and provide appropriate adjacency and a buffer for neighboring recreational and residential uses (NAVFAC, 2008a).

NSA Bethesda 2008 Transportation Management Plan

The 2008 TMP was prepared to support the future development of NSA Bethesda. The TMP includes broad goals and objectives for reducing

vehicular trips, influencing positive mode split changes, and increasing vehicle occupancy ratios, all of which are targeted towards reducing congestion and pollution levels within and around NSA Bethesda (NAVFAC, 2008b). The main goals of the TMP are to:

- Mitigate identified adverse traffic impacts of the proposed new developments.
- Influence the travel choices of the users towards reducing their potential adverse impacts on local area traffic congestion and air pollution.
- Establish an opportunity to work cooperatively with Federal and local agencies on reducing local area traffic congestion and air pollution.
- Improve patient access and parking.
- Obtain comprehensive information needed for analysis of transportation and parking issues.

2010 Installation Appearance Plan

The IAP is the official direction and guidance for designing, developing, and reviewing all physical development at NSA Bethesda. The IAP provides strategies for existing/renovation projects and concepts for new developments. It also promotes an environment that fosters civic beauty, enhances pride and professionalism, protects natural and cultural resources, preserves the existing architectural fabric, and improves the overall quality of life for personnel and the public alike (NAVFAC, 2010a).

One strategy recommendation made in the IAP that directly relates to land use is to locate new land uses in existing areas, rather than develop on pristine or undeveloped sites. According to the IAP this would increase walkability among buildings, reduce vehicular trips, reduce impervious surfaces, increase water quality, reduce the heat island effect, and reduce costs of earthwork and utility construction (NAVFAC, 2010a).

2011 NSA Bethesda Accessibility Plan

An Accessibility Plan for NSA Bethesda was completed in April 2011. This plan identifies and quantifies challenges to accessibility at NSA Bethesda, develops a strategy for implementing universal accessibility there, and provides recommendations for establishing accessible routes and zones within the installation (NAVFAC, 2011c). Goals and objectives of this plan are to:

- Establish accessible connections between NSA Bethesda facilities.
- Create a unified installation through pedestrian-friendly elements and techniques that provide greater accessibility, safety, and aesthetic value.

- Organize functional groups of uses with well-established way finding elements to provide easy and safe access for all users.

Community Plans, Policies, and Land Use Regulations

NSA Bethesda is located within or in proximity to several land use policy, planning, or regulation areas that could have an impact on land uses within the installation. Three plans include NSA Bethesda within their planning area: the M-NCPPC's Planning Area 35, Bethesda-Chevy Chase, and the NCPC's Comprehensive Plan for the National Capital. There are also three other plans that mention NSA Bethesda and affect land uses that are near the installation: the Bethesda CBD Sector Plan, the Woodmont Triangle Amendment to the Bethesda CBD, and the 2003 NIH Master Plan Update.

Maryland-National Capital Parks and Planning Commission – Planning Area 35, Bethesda-Chevy Chase Master Plan

NSA Bethesda is located within the area planned by M-NCPPC. M-NCPPC was created in 1927 to operate park systems and provide planning for most of Montgomery and Prince George's counties in Maryland. NSA Bethesda is located in Planning Area 35, Bethesda-Chevy Chase. The 1990 Bethesda-Chevy Chase Master Plan notes that any actions at NSA Bethesda should be assessed for impacts on surrounding communities as well as to ensure that development is within the guidelines of the master plan for Federal facilities (M-NCPPC, 1990). It also states that the landscaped buffer zones along NSA Bethesda's borders with neighboring communities should be reconfirmed so as to preserve the open space character of the site as development in the CBD of Bethesda intensifies (M-NCPPC, 1990).

The 1990 Bethesda-Chevy Chase Master Plan recommends that the existing zoning surrounding NNMC (now NSA Bethesda) remain unchanged. It does not recommend redevelopment, but does recognize that large lots and special exception sites may be developed in the next 20 years. For Old Georgetown Road and adjacent communities, the objective is to maintain the residential character, preserve neighborhood stability, and discourage further special zoning or land use exceptions, except for those that serve the community. If future development of large lots and special exception sites occurs in the future, the plan recommends that the new land use be residential. NNMC (now NSA Bethesda) helps serve as a buffer between residential neighborhoods located north of the CBD and increasingly dense and urbanized development of the CBD (M-NCPPC, 1990).

National Capital Planning Commission's Comprehensive Plan for the National Capital

The Comprehensive Plan for the National Capital guides planning and development in and around Washington, DC. The Comprehensive Plan is a unified plan composed of both Federal and District elements. The

Federal elements of this plan provide a policy framework for the Federal government in managing its operations and activity in the NCR.

The three Federal elements, workplace, the environment, and transportation, are particularly relevant to operations at NSA Bethesda. The Federal workplace element provides policies for the location of Federal facilities and direction for coordination with local authorities to maximize the positive effect on the immediate surroundings and the region as a whole. The Federal environmental element provides policies for conducting Federal activities and managing properties to preserve, protect, and enhance the quality of the region's natural resources. The Federal transportation element provides policies to promote a multi-modal regional transportation system and transit-oriented development to improve mobility and air quality throughout the region (NCPC, 2004).

The Bethesda Central Business District Sector Plan

The Bethesda CBD lies southwest of NSA Bethesda and covers 405 acres. The CBD contains a wide variety of shops, restaurants, apartments, and hotels, in addition to commercial office space. Development is concentrated primarily around the Bethesda Metro station, and surrounded by lower density development that transitions gradually to surrounding residential areas. Many of the restaurants and retail stores that characterize much of Bethesda's CBD are located in Woodmont Triangle, in the northern part of the Bethesda CBD between Old Georgetown Road and Wisconsin Avenue (M-NCPPC, 1994).

The 1994 Bethesda CBD Sector Plan was updated in 2006 with the Woodmont Triangle Amendment, which was written to address the fact that development in the Woodmont Triangle area did not proceed in accordance with the vision of the 1994 Plan. While the original Sector Plan recommended a range of densities for the various components of the business district, it concentrated the highest densities on the Metro Station and its immediate vicinity. It called for gradually decreasing densities between the core and the CBD fringe, as well as buffers between the CBD and the different adjacent uses on the fringe (M-NCPPC, 1994).

The building height and density limits in the 1994 Sector Plan were found to have inhibited redevelopment in the Woodmont Triangle; therefore, they were reevaluated in the 2006 amendment. The amendment focused on improving the supply of multi-income housing, encouraging small-scale retail, encouraging the establishment of the Bethesda CBD as an arts and entertainment district, promoting safe and attractive streets, and providing increased public amenities.

The primary focus of the amendment is on increasing the amount of allowable residential development and decreasing the amount of future commercial development, with an increase in the allowable residential floor area ratio, and a recommendation for the implementation of a transfer of density program. The amendment also recommends a

continuation of the present transit-oriented development. These recommendations are designed to foster growth, primarily residential, in the Woodmont Triangle area of the Bethesda CBD (M-NCPPC, 1994 and 2006).

2003 NIH Master Plan Update

While this plan does not have jurisdiction over NSA Bethesda, NIH is a large Federal facility in proximity to NSA Bethesda, and actions that this facility takes can impact NSA Bethesda. In 2003, NIH undertook an update of its 1996 Master Plan. The plan update and accompanying EIS, both completed in March 2005, examined the changes to the original Master Plan for any environmental impacts on the surrounding communities. The Master Plan update was found to have no significant impacts on surrounding land use. Furthermore, it was determined that it was compatible with the land use recommendations of the Bethesda-Chevy Chase Master Plan, and it provided a valuable buffer to residential areas to the north, which might otherwise have to deal with encroaching development from the Bethesda CBD (NIH, 2005).

3.10 Socioeconomics

NSA Bethesda is located in Montgomery County, Maryland, which has been identified as the socioeconomic ROI for this EIS. Montgomery County has been selected as the ROI because many of the businesses that provide goods and services to the installation and its employees reside in this area. Additionally, many of the installation's military, civilian, and contracting personnel also reside in Montgomery County (NSAB, 2011b). Although NSA Bethesda may draw personnel and patients from a larger geographic area, the ROI represents the area where the predominant socioeconomic effects of the proposed action would take place.

3.10.1 Population Characteristics

NSA Bethesda is contained entirely within the ROI, which had a population of 971,777 in 2010. Population growth in the ROI slowed from 15.3 percent between 1990 and 2000 to 11.3 percent between 2000 and 2010 (U.S. Census, 2010). Overall, the ROI experienced a 28-percent growth in population between 1990 and 2010, as Table 3-23 shows. Based on population projections calculated by the Maryland Department of Planning, population growth may decrease slightly to 9.6 percent between 2010 and 2020 (MSDC, 2010).

Table 3-23: Population and Percent Change in Population, 1990 to 2020

Location	Year 1990	Percent Change 1990-2000	Year 2000	Percent Change 2000-2010	Year 2010	Percent Change 2010-2020*	Year 2020*
Montgomery County, MD	757,027	15.3	873,341	11.3	971,777	9.6	1,065,000

Note: *Projected population by Maryland Department of Planning (MSDC 2010).
Source: U.S. Census, 2010; MSDC, 2010.

The population identifying themselves as White represented the majority of the population in both the ROI (57.5 percent) and the state (58.2 percent) in 2010. Approximately 17.2 percent of the ROI population identified themselves as African American in 2010, while those identifying themselves as Asian accounted for approximately 13.9 percent of the total population. In comparison, African American and Asian populations accounted for 29.4 and 5.5 percent of the state's population, respectively. Ethnicity is considered separately from race by the U.S. Census. Therefore, approximately 17 percent of the total population within the ROI identified themselves as ethnically Hispanic or Latino regardless of their race (e.g., White). Table 3-24 provides these race and ethnicity figures (U.S. Census, 2010).

Table 3-24: Population Characteristics, 2010

Location	Total Population	Ethnicity (% of Total Population)	Race (% of Total Population)*					
		Hispanic or Latino**	White	Afr. Am.	American Indian/ Alaska Nat.	Asian	Native Hawaiian /Pacific Islander	Some other race/ 2 races or more
U.S.	308,745,538	16.3	72.4	12.6	0.9	4.8	0.2	9.1
Maryland	5,773,552	8.2	58.2	29.4	0.4	5.5	0.1	6.5
Montgomery County, MD	971,777	17.0	57.5	17.2	0.4	13.9	0.1	11.0

*Note: Totals may not add to 100 percent due to rounding.
**Note: Hispanic and Latino is considered an ethnicity, which is a separate classification from race. These percentages represent the percentage of the entire population of the geography that is Hispanic or Latino. Persons identified in this category must also have a race, such as White, African American, Asian, etc.
Source: U.S. Census, 2010.

3.10.2 NSA Bethesda Employment and USU Enrollment

WRNMMC employed approximately 6,800 personnel, or 58 percent of NSA Bethesda's total personnel population in 2011, while USU employed approximately 2,114 personnel, or 18 percent of NSA Bethesda's total personnel population in 2011. The overall installation had a total staff of 11,686 (NSAB, 2011c). In 2011, NSA Bethesda is estimated to have received approximately 1,200,000 patient visits, plus other visitors (NAVFAC, 2011d).

USU had a total enrollment of 957 students in 2011, which are included in the 2,114 USU personnel noted above. Generally, the School of Medicine graduates 166 physicians annually, and the school of nursing graduates 72 annually. Typically, 60 students complete Doctoral and Master's Degree Programs in biomedical science disciplines each year (Pers. Comm., Sadlon, 2011b).

3.10.3 Income Characteristics

The U.S. Census Bureau sets income thresholds that vary by family size to determine the level of poverty for a given area. The percentage of individuals living below the poverty level in the ROI was lower than in the state of Maryland or the United States as a whole in 2010. In Montgomery County, approximately 7.7 percent of the population lives below the poverty level, which is lower than the state and national populations living below the poverty level of 9.9 percent and 15.3 percent, respectively (U.S. Census, 2010). Table 3-25 summarizes populations living below the poverty level, including the percentage of the total population below 18 years of age living in poverty (ACS, 2010a). In 2006, Montgomery County was named one of the wealthiest counties in the United States by the Washington Post (Goldstein and Keating, 2006). In 2010, the median household income in Montgomery County ($89,155) was considerably higher than Maryland's median household income ($68,854) and the nation's median household income ($50,046) (ACS, 2010b).

Table 3-25: Income and Poverty Characteristics, 2010

Location	Median Household Income	Individuals Living Below Poverty (% of Total Population)	Individuals Living Below Poverty, Under the age of 18 (% of Total Population under the age of 18)
U.S.	$50,046	15.3	21.6
Maryland	$68,854	9.9	13
Montgomery County, MD	$89,155	7.7	9.7

Source: ACS, 2010a & b.

3.10.4 Housing Characteristics

In 2010, there were 18,819 vacant housing units in the ROI, accounting for 5 percent of the total housing stock in the ROI. Of these vacant units, approximately 6,592, or 35 percent of all vacant units in the ROI, were available for rent. The state of Maryland had approximately 220,000 vacant housing units, accounting for approximately 9.3 percent of total housing stock in the state in 2010. Approximately 28 percent of these vacant units were available for rent (ACS, 2010c). Table 3-26 includes housing estimates for the ROI and state of Maryland.

Table 3-26: Housing Characteristics, 2010

Location	Occupancy Status		Tenure			Vacancy Status	
	Occupied	Vacant	Vacancy Rate	Renter Occupied	Percent Renter Occupied	For Rent	Percent of Vacant Housing For Rent
Maryland	2,156,411	222,403	9.3%	700,636	32.5%	61,874	27.8%
Montgomery County, MD	357,086	18,819	5.0%	115,621	32.4%	6,592	35%

Source: ACS, 2010c.

3.10.5 Employment

In 2010, the total labor force in the ROI was 489,050, which accounts for approximately 17 percent of the state's labor force. In 2010, the unemployment rate in the ROI and state was 5.6 and 7.5 percent, respectively. Unemployment rates in both the state and the ROI have increased between 2000 and 2010 with the largest increases experienced since 2008, which reflects the economic recession between 2008 and 2009. Table 3-27 summarizes labor force and unemployment estimates are summarized in Table 3-27 (BLS, 2010).

Table 3-27: Employment Characteristics, 2000 and 2010

Location	2000			2010		
	Labor Force	Unemployment	Unemployment Percent	Labor Force	Unemployment	Unemployment Percent
Maryland	2,811,657	100,275	3.6%	2,980,772	222,553	7.5%
Montgomery County, MD	489,050	12,853	2.6%	513,884	28,834	5.6%

Source: BLS, 2010.

The only sector of the economy that would be directly associated with this project would be the construction sector. Because no change in mission or function is anticipated from the operation of the proposed actions, direct associations to other sectors, such as health care and social assistance or Federal civilian employment, are likely to be minor or non-existent. The total employment in 2009 and percent change in employment between 2001 and 2009 associated with this sector along with several other sectors that could be associated with this project are analyzed in detail in the following paragraphs. Table 3-28 summarizes employment by sector.

In 2009, employment in the health care and social assistance sector represented 11 and 12 percent of the total employment in both the ROI and the state of Maryland, respectively. Approximately 17.6 percent of the total employment in this sector within the state is within the ROI. This sector had the second highest total employment levels, behind the professional, scientific, and technical services sector, in the ROI in 2009. Additionally, total employment in this sector has grown by 23 percent in both the state and the ROI between 2001 and 2009. Employment in the construction sector represented 6 percent of the total employment in both the ROI and the state in 2009. This

sector has experienced fairly stable employment between 2001 and 2009 in both the state and the ROI.

Military employment, excluding civilians, accounted for approximately 1 percent of total employment in both the ROI and state in 2009. Between 2001 and 2009, employment in this sector decreased by 7 and 6 percent, respectively, for the ROI and the state. Federal civilian employment accounted for 7 and 5 percent of total employment in the ROI and the state of Maryland, respectively, in 2009. Both the state and the ROI experienced a growth in Federal civilian employment between 2001 and 2009, although the ROI experienced slightly more growth in this sector at 10 percent for the ROI compared to 8 percent for the state (BEA, 2009).

Table 3-28: Employment by Industrial Sector, 2001 to 2009

Industry	Maryland			Montgomery County, MD		
	2009	Percent Change 2001 – 2009	Percent of Total, 2009	2009	Percent Change 2001 – 2009	Percent of Total, 2009
Total employment	3,356,112	8%	–	645,201	8%	–
Farm employment	15,259	-18%	0%	765	-21%	0%
Forestry, fishing, and related activities	6,558	2%	0%	299	-14%	0%
Mining	4,910	64%	0%	1,596	143%	0%
Utilities	10,832	-3%	0%	814	-26%	0%
Construction	216,387	1%	6%	35,931	-3%	6%
Manufacturing	125,656	-28%	4%	14,614	-27%	2%
Wholesale trade	97,606	-4%	3%	12,633	-4%	2%
Retail trade	333,193	-5%	10%	52,405	-12%	8%
Transportation and warehousing	89,149	-2%	3%	8,028	3%	1%
Information	60,989	-12%	2%	18,668	-14%	3%
Finance and insurance	160,668	15%	5%	36,107	16%	6%
Real estate and rental and leasing	167,235	43%	5%	41,083	41%	6%
Professional, scientific, and technical services	331,011	18%	10%	100,602	11%	16%
Management of companies and enterprises	21,579	91%	1%	8,382	343%	1%
Administrative and waste management services	199,575	5%	6%	42,750	0%	7%
Educational services	90,013	31%	3%	16,678	43%	3%
Health care and social assistance	390,656	23%	12%	68,716	23%	11%
Arts, entertainment, and recreation	76,464	25%	2%	16,885	24%	3%
Accommodation and food services	211,726	13%	6%	33,401	-1%	5%
Other services, except public administration	189,486	8%	6%	43,122	6%	7%

Industry	Maryland			Montgomery County, MD		
	2009	Percent Change 2001 – 2009	Percent of Total, 2009	2009	Percent Change 2001 – 2009	Percent of Total, 2009
Federal civilian (Government)	163,392	8%	5%	46,211	10%	7%
Federal military (Government)	46,350	-7%	1%	6,381	-6%	1%
State government (Government)	100,840	2%	3%	1,031	-7%	0%
Local government (Government)	246,578	12%	7%	38,099	5%	6%

Source: BEA, 2009.

3.10.6 Community Services and Facilities

This section describes the area's support services and facilities that could be affected by the proposed project. Schools within proximity to the project, relevant fire and rescue services, police support, and medical facilities are described in this section.

3.10.6.1 Schools

Montgomery County has approximately 200 schools within the Montgomery County School District, which serves approximately 144,064 students (MCPS, 2011a). The Stone Ridge School of the Sacred Heart is the closest school to the installation. This private school for girls provides pre-K through 12th grade education for approximately 600 students (Pers. Comm., Thomas, 2011). Bethesda Chevy Chase High School, with an enrollment of approximately 1,875 students, is the closest public school to the site, located approximately 1 mile south of NSA Bethesda (MCPS, 2011b). Bethesda Elementary, with a student enrollment of 511, is the closest elementary school to the installation, and is also located 1 mile south of NSA Bethesda (MCPS, 2011c). USU is the closest higher education institution to NSA Bethesda because it resides on NSA Bethesda. Numerous other private schools, daycares, and preschools exist within proximity to NSA Bethesda.

3.10.6.2 Fire and Rescue Services

NSA Bethesda has its own fire department and has an agreement with NIH whereby NIH's fire department provides firefighting assistance and assistance with hazardous waste and hazmat spill incidents to NSA Bethesda when necessary. In addition, NSA Bethesda has a mutual aid agreement with the Montgomery County Fire and Rescue Service (MCFRS). MCFRS comprises approximately 2,500 career and volunteer firefighter-rescuers who work from 40 station locations and 19 local fire and rescue departments (MCFRS, 2011). NSA Bethesda, NIH, and MCFRS departments perform drills together twice per year.

Due to their proximity to NSA Bethesda, MCFRS Stations 20 (Bethesda), 41 (Bethesda-Chevy Chase Rescue Squad), and 7 (Chevy Chase) provide

the majority of MCFRS mutual aid assistance to NSA Bethesda. Available resources located at these stations include emergency medical services units, fire suppression units, rescue squads, and hazmat units. Other nearby MCFRS stations (Kensington Station 5 and Bethesda Stations 6 and 26), as well as other Montgomery County stations in proximity to NSA Bethesda, provide additional fire, rescue, and emergency medical services assistance to NSA Bethesda as needed.

3.10.6.3 Police Protection

Security on NSA Bethesda is provided both by Military Police and private security firms. The area surrounding NSA Bethesda is served by the Montgomery County Department of Police. The Department has a police station located 1.3 miles from the installation in downtown Bethesda. The Montgomery County Department of Police responds to incidences that occur off base and provides support to NSA Bethesda if requested. Additionally, NSA Bethesda and the county have a mutual aid agreement to provide emergency services support, as necessary and NIH often provides the second response to the installation.

3.10.6.4 Medical Facilities

WRNMMC provides primary and secondary care along with multiple specialty and subspecialty medical services for military patients. Suburban Hospital is located approximately 1 mile to the west of NSA Bethesda and provides trauma care and care for personnel that are not eligible to be served at WRNMMC. Suburban Hospital has 233 beds with more than 900 medical staff and is the designated trauma center for Montgomery County (Suburban Hospital, 2011).

3.10.7 Environmental Justice and Protection of Children

Environmental Justice — On 11 February 1994, President Clinton issued EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. EO 12898 directs agencies to address environmental and human health conditions in minority and low-income communities so as to avoid the disproportionate placement of any adverse effects from Federal policies and actions on these populations. The general purposes of this EO are as follows:

- To focus the attention of Federal agencies on human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice.
- To foster nondiscrimination in Federal programs that substantially affect human health or the environment.
- To improve data collection efforts on the impacts of decisions that affect minority communities and low-income communities and encourage more public participation in Federal decision-making by ensuring documents are easily accessible (e.g., in multiple languages and readily available).

As defined by the *Environmental Justice Guidance Under NEPA* (CEQ, 1997), "minority populations" include persons who identify themselves as Asian or Pacific Islander, Native American or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Race refers to census respondents' self-identification of racial background. Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, and Central or South American.

A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low-income populations are identified using the Census Bureau's statistical poverty threshold, which is based on income and family size. The Census Bureau defines a "poverty area" as a census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. A census tract is a small geographic subdivision of a county and typically contains between 1,500 and 8,000 persons (U.S. Census, 2011).

Race, ethnicity, household income, and poverty data are presented for the five census tracts that reside within proximity to or encompass NSA Bethesda, shown in Table 3-29. For comparison, all information in Table 3-29 is presented from the American Community Survey (ACS) 2005-2009 estimates. Among the five census tracts, Tract 7048.01 had the highest percentage of its population living below the poverty level at 13 percent. In comparison, the county had 5 percent, while the state had 8 percent living below the poverty threshold. Census Tract 7048.01 is located to the south of NSA Bethesda and to the west of Wisconsin Avenue. It is known as the Woodmont Triangle and is predominantly composed of medium density housing and retail establishments.

NSA Bethesda is located entirely within Census Tract 7050, along with NIH, and includes an area of a single family, suburban neighborhood located to the south of NSA Bethesda along the east side of Wisconsin Avenue. This census tract does not have meaningfully larger proportions of minority populations when compared to the minority populations in the ROI and the state. Similarly, there are no census tracts with more than 20 percent of their populations living below the poverty level (ACS, 2009).

Protection of Children — EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. This EO, dated 21 April 1997, further requires Federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. EO 13045 defines environmental health and safety risks 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 (such as the air we breathe, the food we eat, the water we drink and

use for recreation, the soil we live on and the products we use or are exposed to)."

Children reside in neighborhoods and schools close to NSA Bethesda and walk along the sidewalks of the roadways that could potentially be used by construction traffic associated with this project. Children also attend a daycare, and some may reside within the installation at Flag Housing, which is located on the northern side of the installation and is directly west of the warehouse area. Impacts to children are identified in Section 4.10 of this EIS.

Table 3-29: Race, Ethnicity, Income, and Poverty Data for Geographic Areas, 2009

Geography	Total Population	Race			Ethnicity	Median Household Income (2009$)	Percent of Population Below Poverty Level
		White	Afr. Am.	Asian	Hispanic or Latino		
State of Maryland*	5,637,418	58%	29%	5%	7%	$69,475	8%
Montgomery County, MD*	946,172	53%	16%	13%	15%	$92,213	5%
Census Tract 7044.02, Montgomery County, Maryland	6,672	77%	4%	10%	7%	$109,141	1%
Census Tract 7046, Montgomery County, Maryland	5,036	79%	6%	8%	3%	$131,591	2%
Census Tract 7048.01, Montgomery County, Maryland	4,012	77%	6%	13%	3%	$67,540	13%
Census Tract 7050, Montgomery County, Maryland	4,960	77%	7%	4%	9%	$117,232	6%
Census Tract 7051, Montgomery County, Maryland	5,043	88%	2%	4%	4%	$158,333	1%

Source: ACS, 2009.
*Note: While data for population, race, ethnicity, income, and poverty are presented with Census 2010 data in sections 3.10.1 and 3.10.3, the latest data available for the census tract level is available from the ACS 2005-2009 estimates. ACS 2005-2009 estimates for the county and state are presented in this table for comparison against the Census tracts.

3.11 Human Health and Safety

This section describes the human health and safety concerns at NSA Bethesda, including hazardous material and hazardous and medical wastes.

3.11.1 Underground and Above-Ground Storage Tanks

At NSA Bethesda, Oil Operations Permit (NSA Bethesda Oil Program) No. 2005-OPT-3360 authorizes storage of oil per Title IV of the Oil Pollution Act and other applicable regulations in above-ground storage systems.

Table 3-30 identifies the fuel storage tanks that would be directly impacted by the demolition or construction activities of the proposed action.

Table 3-30: Fuel Storage Tanks in Demolition & Construction Footprints

Building to be Demolished	Tank ID #	Tank Contents and Volume
Medical Facilities Development		
Bldg. 7	UST 285A	Diesel, 2,500 gallons
Bldg. 7	Daytank 285	Diesel, 50 gallons
Warehouse Area		
Bldg. 99	UST 208A	Diesel, 8,000 gallons
Bldg. 99	UST 2772A	Gasoline, 10,000 gallons
Bldg. 99	AST 328	Kerosene, 500 gallons
Bldg. 99	OWS 272-1	2,500 gallons
Taylor Road Facilities		
Bldg. 53	UST 276A	Diesel, 1,000 gallons
Bldg. 53	Daytank 276A	Diesel, 100 gallons

UST (underground storage tank)

In addition to the above fuel storage tanks, Building 1 has two 1,000 gallon, diesel underground storage tanks (USTs) (UST 289A and UST 291A) and two diesel daytanks (daytank 289 – 50 gallons; daytank 291 – 25 gallons) that are in the immediate vicinity of the Building C construction footprint.

3.11.2 Hazardous Materials/Hazardous Waste

WRNMMC is a hospital and also houses research facilities that use hazardous materials for specialized functions and regular operations of the facilities. WRNMMC has a Hazardous Materials (Hazmat) Management Plan to ensure proper handling, storage and disposal of hazardous materials. Incoming hazmat is handled through warehousing at Building 54. An authorized user list exists, and there is an annual inspection for hazmat in every space within the installation. Use of any new or unauthorized chemical requires permission from NSA Bethesda’s Environmental Programs Department. Hazardous Material Certificate (NSA Bethesda Hazardous Materials (Hazmat) Program) No. 2006-0400 registers NSA Bethesda as a hazardous material use site.

WRNMMC is classified as a large quantity hazardous waste generator and maintains a permitted Transportation, Storage, and Disposal facility at Building 256, where hazardous waste can be stored for up to 1 year. WRNMMC operates under MDE Hazardous Waste Program, Controlled Hazardous Substances Permit A-221 (EPA ID No. 4170024687).

However, the majority of hazardous waste handled by WRNMMC personnel consists of small quantities of chemicals generated by medical laboratory testing, research experiments, and expired shelf life stocks. The majority of the hazardous waste from the hospital comes from the anatomic pathology or hematology facilities. The other three noticeable sources of hazardous waste are medical equipment repair (batteries and lead) and dental and pharmacy services. The hazardous waste from the pharmacy includes the expired and spilled medications.

Hazardous wastes are picked up from the generating locations that regularly generate hazardous waste and on an as-requested basis for all sources. Information on hazardous wastes is entered into a computerized management system, and labels are prepared prior to removing the hazardous wastes from the satellite area. The hazardous wastes are usually taken to the storage building where they are maintained until ready for shipment. The Defense Reutilization and Marketing Office validates all shipping and labeling information, and waste is sent out by a contracted transporter. The medical facilities currently generate approximately 2,500 pounds of hazardous waste per month (Pers. Comm., Brandt, 2011).

USU is a large quantity hazardous waste generator and operates under its own permit. The USU currently produces an average of 1,200 pounds of hazardous waste per month (Pers. Comm., Sadlon, 2011f).

WRNMMC also provides a full spectrum of diagnostic and therapeutic radiologic services (WRNMMC, 2012). Radiation Safety Service at WRNMMC ensures the safe use of radioactive material, lasers, and other sources of ionizing radiation. The Service also ensures Command compliance with Nuclear Regulatory Commission and other Federal and Navy regulations (WRNMMC, 2012).

3.11.3 Asbestos-containing Material, Lead and Lead-based Paint, and Other Concerns

It is standard practice to check for asbestos, lead-based paint (LBP), and mold prior to demolition or renovation in any building. NSA Bethesda has procedures in place to manage the substances, identify problem areas, protect and inform affected persons, remediate as necessary, and comply with the applicable standards.

Buildings constructed prior to 1978 may contain LBP, and buildings constructed prior to 1989 may contain asbestos. These two building components were regulated in 1978 and 1989, respectively. Therefore, it is plausible that any of the buildings identified below that were constructed before these years may contain LBP or asbestos-containing material (ACM) depending on their year of construction. Table 3-31 lists the buildings that would undergo demolition or renovation under the proposed actions and the year those building were constructed.

Table 3-31: Building Construction Years

Building C Demolition	
Building 2	1941
Building 4	1941
Building 6	1942
Building 7	1963
Building 8	1963
Warehouse Area Facilities Demolition	
Building 80	Built after 1989
Building 99	Built after 1989
Building 101	Built after 1989
Building 149	1951
Building 152	1951
Taylor Road Facilities Demolition	
Building 28	1952
Building 53	1976
Building 59	1989
Internal Renovations	
Building 1	1941
Building 3	1943
Building 5	1943
Building 9	1980
Building 10	1980
Building 13	1941
USU Renovations	
Building A	1978
Building B	1980
Building C	1980

3.11.4 Regulated Medical Waste

In the state of Maryland, Regulated Medical Waste (RMW) includes fluid blood, blood-soiled articles, anatomical material, microbiological waste, waste from isolation rooms, and all sharps and syringes. The majority of medical waste at WRNMMC comes from inpatient isolation wards. WRNMMC generates approximately 39,000 pounds of medical waste per month, while USU generates approximately 2,400 pounds of medical waste per month (Pers. Comm., Brandt, 2011). RMW must be separated from other waste at the point of origin. Strict packaging and labeling procedures exist for RMW and must be adhered to before RMW is moved. At WRNMMC, the Sterile Processing Department takes the containers (from Buildings 1-10) to the Medical Waste Cage located on the loading dock of Building 55. From there the sterilized RMW is sent off-site for incineration to Curtis Bay Energy, which is located in south Baltimore. The facility operates a commercial medical waste incinerator that takes medical and other waste from hospitals and other medical facilities for disposal. The ash from the incineration is trucked offsite to a Subtitle D landfill.

3.11.5 Anti-terrorism/Force Protection

New facilities must comply with criteria contained in UFC 4-010-01 *DoD Minimum Antiterrorism Standards for Buildings*, dated 9 Feb 2012. The

standards are very specific based on various situations, but in general, for an installation with a controlled perimeter such as WRNMMC, the criteria require new conventional construction with occupancies greater than 50 people to maintain an 82-foot setback from all roads and parking. Construction of facilities with a lower density requires a 33-foot setback. Renovation projects must comply with the criteria if the renovation is more than 50 percent of the building's replacement value. In addition, there is a 148-foot standoff distance from the controlled perimeter or fence line around the installation.

NSA Bethesda was built during a time when AT/FP measures were not required. As a result, the majority of the existing facilities on the installation do not meet standoff distances or separation goals for buildings, parking, and perimeters. However, there are provisions in the AT/FP criteria that allow reduced setbacks with a blast analysis and construction modifications that would be equivalent to the required setbacks. Compliance would require all new buildings to meet the minimum standoff distances from roadways and parking, as well as from NSA Bethesda's perimeter, and could include building hardening measures. AT/FP would be provided in accordance with *UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings* to the maximum extent practicable.

4.0 ENVIRONMENTAL CONSEQUENCES

The implementation of the proposed actions and alternatives has the potential to affect various environmental resources within NSA Bethesda, as well as the potential to affect certain resources beyond the boundaries of the installation. This section identifies and evaluates the anticipated environmental consequences/impacts associated with each alternative. It also evaluates the No Action Alternative. The terms impact and effect are used interchangeably in this EIS to refer to the consequences. The majority of the potential impacts would be associated with construction and demolition activities, rather than operation of the proposed facilities. Therefore, this section only includes a discussion of operational impacts if any would be anticipated.

Tables 2-5 and 2-6 in Chapter 2 present a summary of the impacts discussed in this chapter.

4.1 Geology, Topography, and Soils Consequences

4.1.1 Geology and Topography

4.1.1.1 Geology and Topography Impacts: Medical Facilities Development

Building C – Construction and Demolition

Demolition of existing structures (Buildings 2, 4, 6, 7, and 8) and replacement with Building C would work within an existing developed footprint and require excavation of approximately 18,810 cubic yards to prepare the building foundation. There would be no new disturbance of bedrock or change in site topography, so there would not be an impact on geological or topographic resources.

Parking Alternatives

- *Underground Parking* – The topographical analysis shows the slopes in the area of the proposed parking garage are 5 percent or less. In addition, the lawn above the proposed garage would be restored to similar topography after construction. Therefore, impacts on topography are not anticipated to be significant.

  The 225,000 SF (2.6 acres) underground parking facility would require excavation of soil and rock. A geotechnical investigation indicates that approximately 27,400 cubic yards of rippable rock would need to be excavated to accommodate the parking garage approximately 260 to 270 feet below the ground. The construction of the garage would interact with a shallow aquifer in the area, requiring dewatering to be incorporated into the design. Groundwater at NSA Bethesda occurs at a depth ranging from 10 to

50 feet below the ground surface, but a hydrological investigation conducted in 2011 in the vicinity of the proposed location for the parking garage found groundwater levels were greater than 30 feet. The construction of the garage would not affect Lake Eleanor, the perennial pond west of the construction site, or its source spring (NAVFAC, 2011k).

Overall, although there would be some impacts on bedrock, and permanent dewatering would be necessary, impacts on geology would not be significant because the site is deemed acceptable for construction of an underground parking garage from a geotechnical perspective (NAVFAC, 2011k) and rock excavation would be conducted in accordance with Federal, state, and local safety regulations.

- *Warehouse Area Parking* – An above-ground parking garage would be constructed where several temporary warehouse facilities currently exist. Excavation of approximately 670 cubic yards would be required to ensure the foundation can handle the load of a maximum 6-story parking structure, and the depth of excavation would be greater if some levels of the garage are constructed underground. However, because the site is in an area of previous development, significant impacts on geology and topography associated with the warehouse area parking garage would not be anticipated.

- *H-Lot Parking* – The H-Lot above-ground parking garage would be constructed on an existing parking lot. Excavation of approximately 630 cubic yards would be needed to install the foundation for the garage so it can handle the loads required for a maximum 6-story garage. However, because the site is in an area of previous development, significant impacts on geology and topography associated with the H-Lot area parking garage would not be anticipated.

- *Taylor Road Facilities Parking* – Similar to the warehouse area and H-Lot garages, limited excavation and grading would be necessary to accommodate installation of the foundation for a maximum 5-story above-ground garage. It also would be built on an already developed site; therefore, impacts on geology and topography associated with the Taylor Road Facilities parking garage would not be significant.

Medical Facilities Internal Renovations

Internal renovations would not require ground disturbance, so there would be no impacts on geology or topography.

Temporary Medical Facilities

The temporary medical facilities structures would consist of temporary, modular, and prefabricated structures placed on the existing parking areas. Small trenches would connect campus utility lines (e.g., power, CATV, water, and sewer) to these facilities. However, the construction of this trench would have no impact on geology or topography. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil would be trenched, but impacts would be temporary and the area would be returned to existing conditions.

Utilities Upgrades

Utilities including water lines, condensate lines, and electrical conduit would be upgraded or replaced in association with the Medical Facilities Development; a total of approximately 50,792 SF (1.17 acres) would be trenched. Approximately 9,255 linear feet, or an area of 37,020 SF (0.85 acre) of soil would be trenched to upgrade or replace the existing condensate utility lines. Approximately 2,463 linear feet, or an area of 9,848 SF (0.23 acre) of soil would be trenched for the water line connection between the proposed backup water tanks and Building 16. An additional 980 linear feet, or 3,920 SF (0.09 acre) would be trenched for electrical upgrades. Soil removed during trenching would be re-compacted once construction is complete.

Three cooling towers would be demolished and replaced in the same location, with a fourth cooling tower constructed just north and adjacent to the existing facilities in an area that is mostly disturbed. Demolition, reconstruction and replacement of the three cooling towers, and construction of a fourth cooling tower would require minimal excavation on already disturbed or mostly disturbed land and would not result in impacts on geology or topography. Excavation of approximately 300 cubic yards would be required.

Construction of the backup water supply entails installing four 50,000-gallon underground water storage tanks, each tank approximately 13 feet wide by 52 feet long. Approximately 1,020 cubic yards of soil would need to be excavated to install the tanks. Disturbance of bedrock would not be likely, and topography would not change noticeably. Therefore, impacts on geology and topography would be anticipated to be minimal.

Accessibility and Appearance Improvements

The majority of the accessibility and appearance improvements would not impact geology or topography, because they would involve enhancements to existing infrastructure. Landscaping projects involving new vegetation would not extend substantially below the ground surface. The Stoney Creek Trail System project would include addition of pathways in new areas and construction of one new bridge and one replacement bridge over Stoney Creek. Some areas of the Stoney Creek Trail System, particularly on the north side, would be located

on 15 percent or higher slopes and would require intensive, localized grading to level the slopes to not more than 5 percent and stabilization, such as retaining structures for their development. During the final design process the types of retaining structures needed would be refined but could include riprap supported by concrete footings. The new bridge over Stoney Creek, would be a pathway bridge only. The new bridge would likely require riprap to stabilize the shoreline and would be supported by concrete footings on both ends, but it is not likely to disturb much land and therefore, only minor disturbances to topography are expected to occur.

Only minor impacts on geology are anticipated from the accessibility and appearance improvements because the projects would require minimal excavation. The exceptions are the two bridges over Stoney Creek that would require limited excavation such as driving piles into the soil, and potentially some sections of the Stoney Creek Pathway that would requirement excavation for ADA accessibility. The total estimated amount of excavation needed for all of the accessibility and appearance improvements projects would be approximately 450 cubic yards.

Building 13 Renovations

External renovations to Building 13 would involve minimal ground disturbance within the area of the existing structure, and excavation would be approximately 110 cubic yards. There would be no impacts on geology or topography.

Construction Material Storage

The three areas proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Therefore, there would be no impacts on geology or topography.

4.1.1.2 Geology and Topography Impacts: University Expansion

University Expansion – Alternative 1

The Alternative 1 site contains steep topography, with the western half of the site containing slopes steeper than 15 percent. The eastern side, although not as steep, still has slopes of 5 to 15 percent. Construction of the new facility and parking garage would require extensive grading and cut and fill, resulting in noticeable changes to topography. Impacts on geology would not be noticeable as it is not likely that excavation of bedrock would be necessary. Approximately 1,115 linear feet, or an area of approximately 4,460 SF (0.1 acre) would need to be trenched for associated utilities upgrades, but there would be no impacts on geology or topography.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the

helipad and the Navy Exchange) are already disturbed, flat areas. Therefore, there would be no impacts on geology or topography.

University Expansion – Alternative 2

The site for Alternative 2 is relatively flat and currently developed, although there is a narrow, steep slope between the existing USU campus and the site. Less extensive grading would be needed at this site compared to the Alternative 1 site since a majority of the site has been previously graded to support the existing parking lot. Approximately 500 linear feet, or an area of approximately 2,000 SF (0.05 acre) would need to be trenched for associated utilities upgrades. Alternative 2 would result in modest impacts on topography. No impacts on geology are anticipated.

Under Alternative 2, the areas proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Therefore, there would be no impacts on geology or topography.

University Expansion – Internal Renovations

Internal renovations would not require ground disturbance, so there would be no impacts on geology or topography.

4.1.1.3 Geology and Topography Impacts: No Action Alternative

Under the No Action Alternative, there would not be any new development; therefore, there would be no impacts on geology or topography.

4.1.2 Soils

4.1.2.1 Soils Impacts: Medical Facilities Development

In preparing for the construction of the Medical Facilities Development, heavy machinery such as backhoes, excavators, graders, or bulldozers would be used to demolish existing facilities and surfaces, lay foundations, dig trenches for utility line relocations or upgrades, excavate, and construct the facilities. As a result, soils within and adjacent to the construction sites would be compacted, soil layer structure would be disturbed and modified, and soils would be exposed, increasing the overall potential for erosion. Construction would be expected to directly affect soils.

Construction projects with more than 5,000 SF of earth disturbance require an approved erosion and sediment control plan, consistent with Maryland’s most current erosion and sediment control guidelines, and stormwater management (COMAR 26.17.01 and 26.17.02). Prior to construction at any site, a General Permit for Construction Activity would be obtained, which would include an approved sediment and erosion control plan. This plan would develop appropriate site-specific BMPs for controlling runoff, erosion, and sedimentation

during construction and demolition activities. Site-specific BMPs would be developed based on proper design, run-off calculations, slope factors, soil type, topography, construction activities involved, and proximity to waterbodies. As part of these BMPs, NSA Bethesda would implement sedimentation and erosion control measures to retain sediment generated by land-disturbing activity within the boundaries of the construction area. BMPs could include, but are not limited to, protective devices preventing surface drainage flows, erosion control matting, rip-rap, and sediment traps. The application of any or all of these BMPs, or other appropriate BMPs, would depend on specific ground conditions in the areas disturbed by construction. In addition, as the amount of disturbed ground would exceed 1 acre, a National Pollutant Discharge Elimination System permit would be required.

Sustainable principles including EPAct and LEED® Silver features would be integrated into the design, development, and construction of the Medical Facilities Development and coordinated to the degree practical with the LID requirements adopted by the Navy.

Areas disturbed outside of the footprints of the new construction would be aerated and reseeded or replanted with native vegetation and/or re-sodded following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity.

Building C – Construction and Demolition

The demolition of buildings 2, 4, 6, 7, and 8, and construction of Building C would affect approximately 2.6 acres of mostly previously disturbed area. Construction and demolition would occur within approximately the same footprint and would have limited impacts on soils, given that the site has already been disturbed and soils compacted to accommodate the foundations for the existing buildings. Disturbance for the new building would be similar to the previous buildings footprints. As discussed under Section 4.1.1.1, excavation would be required to prepare the foundation for Building C. During demolition, one UST and one daytank would be removed; if any contaminated soils are discovered during the removal process, they would be remediated in accordance with Federal and state regulations (see also Section 4.11).

Parking Alternatives

- *Underground Parking* – The soil type in this area, Glenelg silt loam, is suitable for development as long as the slopes are minimal. More pronounced slopes are prone to erosion. Although the soil unit indicates slopes greater than 8 percent, the slopes are not steep in the proposed area for the parking garage. It is estimated that an area of 112,500 SF (2.6 acres) would be disturbed during construction. A geotechnical investigation indicates that approximately 27,400 cubic yards of rippable rock would need to be excavated to accommodate the parking garage at

approximately 260 to 270 feet below the ground. Soils beneath the parking garage would be subject to compaction as a result of the construction. Surface soils would be replaced after construction that would restore the Front Lawn of Building 1 to natural conditions.

- *Warehouse Area Parking* – The construction of the garage in the warehouse area would require excavation to accommodate garage foundations and features such as an elevator well. Approximately 29,200 SF (0.67 acre) of soil would be disturbed and approximately 670 cubic yards would need to be excavated. The area has already been disturbed and been subject to compaction; therefore, there would be little additional compaction to soil in this area. The primary soil type in this area, Glenelg silt loam, is appropriate for development, although it is prone to erosion on steeper slopes. Although the soil type indicates slopes steeper than 8 percent, the site itself is fairly level, particularly within the limits of development planned for the parking garage.

  Impacts on soils associated with this garage would therefore be minimal, and would be related to compaction and the excavation necessary to construct the foundation-related features.

- *H-Lot Parking* – The H-Lot parking garage would be constructed on an existing parking lot, so the soils have already been subject to some level of disturbance and compaction. Approximately 39,100 SF (0.9 acre) would be disturbed for the construction of the parking garage, and excavation of approximately 630 cubic yards would be needed to install the foundation for the garage so that it can handle the required loads, and elevators. Soils associated with this garage and impacts on soils would be similar to those identified under the warehouse area parking structure.

- *Taylor Road Facilities Parking* – The Taylor Road Facilities parking garage would be constructed on already developed land, so the soils have already been subject to some level of disturbance and compaction. Approximately 28,450 SF (0.65 acre) would be disturbed in association with the construction of the parking garage, and limited excavation would be needed to install the foundation for the garage so that it can handle the required loads, and elevators. The soils at this site are predominantly urban land and are suitable for development on gentle slopes. Impacts to soils associated with this garage would therefore be minimal, and would be related to compaction and the excavation necessary to construct the foundation-related features.

Medical Facilities Internal Renovations

There would be no impacts on soils because internal renovations would be entirely within existing buildings and would not involve any excavation or grading.

Temporary Medical Facilities

The temporary medical facilities would be temporary, modular, and prefabricated structures placed on the existing G-Lot parking. A small trench would be excavated to connect campus utility lines (e.g., power, CATV, water) to these facilities. Approximately 2,401 linear feet, or an area of 9,604 SF (0.22 acre) of soil, would be trenched, but impacts would be temporary and the area would be returned to existing conditions. The construction of this trench would have a minimal impact because soils in this area have already been disturbed by the existing parking lot.

Utilities Upgrades

As noted in the geology and topography section, the replacement or upgrades of the utility lines would require trenching to access the existing lines (see Figure 3-2 for locations of utility line upgrades). Approximately 9,255 linear feet, or an area of 37,020 SF (0.85 acre) of soil would be trenched to upgrade or replace the existing condensate utility lines. Approximately 2,463 linear feet, or an area of 9,848 SF (0.23 acre) of soil would be trenched for the water line connection between the proposed backup water tanks and Building 16. An additional 980 linear feet, or 3,920 SF (0.09 acre), would be trenched for electrical upgrades. Soil removed during trenching would be re-compacted once construction is complete. The lines cross several soil types, including Glenelg silt loam, urban land, and a small area of Glenville silt loam. Glenville soils are not generally well-suited to development, although in this instance, disturbance and development is limited to what is necessary to replace the condensate lines. Impacts on all soils associated with line replacement or upgrade would be limited, given that there has been previous disturbance and trench widths would be narrow and linear.

Demolition and replacement of the cooling towers would require some grading and excavation of soils (approximately 300 cubic yards). The soils in these areas have already been disturbed and subjected to compaction. Demolition and replacement of the cooling towers would minimize new soil disturbance, but would include some additional disturbance to accommodate the new structures. Approximately 4,450 SF (0.1 acre) of soil would be disturbed in association with this. Some grading would take place and the soils in these areas would be subject to re-compaction. These structures would require minimal excavation to accommodate the foundation. The cooling towers are in areas with urban land soil, and have already been disturbed and built upon.

The backup water supply entails the installation of underground water tanks, so there would be excavation of soil. Approximately 26,450 SF (0.6 acre) of soil would be disturbed, and the soils beneath the tanks would be subject to compaction. Assuming a 13-foot-wide by 52-foot-long water storage tank were to be installed, which would hold 50,000 gallons of water, a total of approximately 1,022 cubic yards of soil would be excavated to install all four tanks. Additionally, trenching to install new, non-potable water lines to supply the new parking facility would also be required. These lines would connect the backup water supply tanks to the parking garage's fire suppression system. The impact of their installation on soils is expected to be minimal because most of the soil removed for this project would be replaced once the installation of these lines is complete.

In general, impacts on soils as a result of the utilities upgrades would be minimal throughout NSA Bethesda.

Accessibility and Appearance Improvements

Improvements to the Stoney Creek Trail System would compact soil under the trail. Additionally, construction of a new foot-bridge and replacement of an existing one over Stoney Creek would disturb and compact soil under the foundations for these bridges. Some areas of the Stoney Creek Trail System would be located on 15 percent or higher slopes and would require intensive, localized grading and stabilization of soils, such as retaining structures (for example, riprap supported by concrete holdings) for their development. Other accessibility and appearance improvement projects would mostly represent improvements to existing infrastructure. As all of these improvements, with the exception of the one new foot-bridge, would occur on land that has been previously disturbed, and only minor additional soil impacts would occur, the impacts on soils would be minimal. The new bridge over Stoney Creek, which would be a pathway bridge only, is not likely to disturb much land and therefore, only minor disturbances to soils are expected to occur.

Building 13 Renovations

Minor impacts on soils would result from the external renovations of Building 13 as they would involve minimal ground disturbance within the area of the existing structure. Excavation of approximately 110 cubic yards would be required.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, and erosion and sediment control measures would be implemented. Impacts on soils would be temporary because the areas

would be restored to original conditions after construction is completed.

4.1.2.2 Soils Impacts: University Expansion

As with the Medical Facilities Development, all construction activities associated with the University Expansion would include measures for sediment and erosion control, and would comply with applicable regulations to ensure that erosion and other impacts on soils are minimized.

University Expansion – Alternative 1

The site for Alternative 1 contains steep topography, with the western half of the site containing slopes steeper than 15 percent. The eastern side is much flatter but does have noticeable slopes at 5 to 15 percent. Most of the site is presently forested with some trails. Construction of the new facility and parking garage would require extensive grading and cut and fill, resulting in disturbance of a large amount of soil. Approximately 85,250 SF (1.96 acres) would be disturbed to construct the facility, and an additional 36,000 SF (0.83 acre) would be disturbed for the parking garage, for a total of approximately 121,250 SF (2.80 acres). Approximately 1,115 linear feet, or an area of approximately 4,460 SF (0.1 acre) would need to be trenched for associated utilities upgrades, but impacts on soils would be temporary. Additionally, the compaction of previously non-compacted soils is expected to occur under this alternative since most of the soil on this site is presently not compacted. The only compacted soil on the site lies under existing trails and around the pond immediately south of the existing USU campus.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, and erosion and sediment control measures would be implemented. Impacts on soils would be temporary because the areas would be restored to original conditions after construction is completed.

University Expansion – Alternative 2

The site for Alternative 2 is relatively flat and already contains the developed N-Lot parking. Therefore, it would require only some grading and excavation. Approximately 500 linear feet, or an area of approximately 2,000 SF (0.05 acre) would need to be trenched for associated utilities upgrades, but impacts on soils would temporary. Additionally, the footprint of the disturbed area under this alternative would be approximately 70,500 SF (1.6 acres) as Building F would be constructed over the above-ground parking garage. The soils on this site would be subject to additional compaction; however, the soils on a portion of this site are already compacted due to the

existence of N-Lot on the site. Soils on this site are a combination of Glenelg silt loam and urban land, and are suitable for development, particularly on flatter topography where the potential for erosion is not high.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, and erosion and sediment control measures would be implemented. Impacts on soils would be temporary because the areas would be restored to original conditions after construction is completed.

University Expansion – Internal Renovations

There would be no impacts on soils as the internal renovations would be entirely within existing buildings and would not involve any excavation or grading.

4.1.2.3 Soils Impacts: No Action Alternative

Under the No Action Alternative for the Medical Facilities Development and University Expansion, there would not be any new development of facilities, so there would be no impacts on soils.

4.2 Water Resources Consequences

4.2.1 Surface Water

The construction/demolition/renovation activities proposed under all of the proposed actions would fall under the permitting and regulatory requirements of Maryland's Environment Article, Title 4, Subtitle 1 and 2 for erosion and sediment control and stormwater management (COMAR 26.17.01 and 26.17.02); Environment Article, Title 9, Subtitle 3 (COMAR 26.08.04); Environment Article, Title 5, Subtitle 05 (COMAR 26.17.04); Maryland's stormwater management program to address stormwater discharges (General Discharge Permit No. 03-DP-2537, General National Pollutant Discharge Elimination System Permit No. MD0025670); the Federal Clean Water Act Section 402; and the CFR (40 CFR 122.26). Erosion and Sediment Control Plans would meet the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control (MDE, 2011). Stormwater management plans would follow the 2000 Maryland Stormwater Design Manual (MDE, 2000) and the 2010 Stormwater Management Guidelines for State and Federal Projects, which supplement the Stormwater Management Regulations and the Design Manual (MDE, 2010). They would also follow Maryland's Stormwater Management Act of 2007 (MDE, 2007), which emphasizes nonstructural BMP measures.

These regulations require that any proposed development project that disturbs more than 5,000 SF of land and 100 cubic yards of earth include a stormwater management plan and/or waiver application, to be submitted to MDE, Water Management Administration for review and

approval, before construction commences, unless otherwise exempted. Also, for Federal redevelopment projects exceeding 5,000 SF, there is an objective for the total amount of runoff from impervious surfaces to be reduced by at least 50 percent. Redevelopment is the construction, alteration, removal, or improvement performed to existing impervious area at a site where the existing project site impervious area exceeds 40 percent. Where site conditions prevent the reduction of impervious area, then stormwater management practices are to be implemented to provide qualitative control for at least 50 percent of the site's impervious area. When a combination of impervious area reduction and stormwater practice implementation is used, the combined area must equal or exceed 50 percent of the site. NSA Bethesda adheres to these requirements (NNMC, 2000). Site conditions would determine which of these requirements would be used prior to construction. Potential impacts on existing water resources are considered to occur to hydrology and water quality if the limitations established by the Clean Water Act are exceeded.

Prior to construction of any of the projects under the proposed actions a General Permit for Construction Activity would be obtained, which would include an approved sediment and erosion control plan. Appropriate site specific erosion and sediment control plans would be prepared where necessary to reduce surface erosion and control runoff of pollutants. Implementation of an erosion and sediment control plan would reduce erosion of exposed soils, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter a body of water. Increases in surface stormwater runoff during construction and operation would be controlled by stormwater BMPs as well as erosion and sedimentation controls to reduce potential impacts on adjacent land and waters. Site conditions would determine which of these BMPs would be used prior to construction; BMPs could include, but are not limited to:

- Using erosion containment controls such as silt fencing and sediment traps to contain sediment onsite where necessary.
- Covering disturbed soil or soil stockpiles with plastic sheeting, jute matting, erosion netting, straw, or other suitable cover material, where applicable.
- Inspecting erosion and sediment control BMPs on a regular basis and after each measurable rainfall to ensure that they are functioning properly, and maintain BMPs (repair, clean, etc.) as necessary to ensure that they continue to function properly.
- Sequencing BMP installation and removal in relation to the scheduling of earth disturbance activities, prior to, during, and after earth disturbance activities.
- Phasing clearing to coincide with construction at a given location to minimize the amount of area exposed to erosion at a given time.

In addition, to reduce the risk of adverse impacts on water quality from the use of construction vehicles and equipment, the construction

contractor would submit a hazardous spill plan, stating the protocols to be taken in the event of a fuel leak or spill. This plan would incorporate preventative measures to be implemented including the placement of refueling facilities, storage and handling of hazardous materials, and notification procedures for a spill. Construction-related refueling and maintenance activities would occur on impervious surfaces.

Containment devices and bioretention or other materials would be available to ensure that any spills are contained and do not enter any surface waters via overland flows or stormwater conveyance systems. The Medical Facilities Development and the University Expansion would be implemented in compliance with MDE regulations and the applicable requirements of the MDE Stormwater Design Manual (MDE, 2000). Prior to construction, a stormwater management plan must be implemented by NSA Bethesda and approved by MDE. This plan would address the increase in impervious surfaces and subsequent increases in overland runoff by incorporating stormwater control designs into the project to manage the rate at which runoff and associated nutrients leave various construction sites. This requirement was made more stringent by Maryland's Stormwater Management Act of 2007 (MDE, 2007), which requires that environmental site design, through the use of nonstructural BMPs and other better site design techniques, be implemented to the maximum extent practicable.

The following nonstructural stormwater management practices would be considered and applied according to the Maryland Stormwater Design Manual (MDE, 2000) to minimize increases in new development runoff: 1) natural area conservation, 2) disconnection of rooftop runoff, 3) disconnection of non-rooftop runoff, 4) sheet flow to buffers, 5) grass channels, and 6) environmentally sensitive development. The LID measures would be among those considered and implemented when practical. The Navy would also adhere to stormwater management requirements for development or redevelopment projects involving a Federal facility, contained in EISA 2007, as implemented by DoD.

The following structural stormwater management practices would also be considered and designed according to the Design Manual (MDE, 2000) to satisfy the applicable minimum control requirements established in Section 4.1 of the Guidelines: 1) stormwater management ponds, 2) stormwater management wetlands, 3) stormwater management infiltration, 4) stormwater management filtering systems, and 5) stormwater management open channel systems. Stormwater controls for the proposed project that could be incorporated into the project design, where applicable, include, but are not limited to: bioretention, dry wells, filter/buffer strips, swales, rain barrel, cistern, and infiltration trenches.

Increases in parking once the facilities become operational would increase the amount of oil, grease, and antifreeze that could be carried into the waters through runoff. However, the Navy would implement BMPs and follow SOPs to minimize the runoff.

4.2.1.1 Surface Water Impacts: Medical Facilities Development

The stormwater management plan that would be implemented by NSA Bethesda, as discussed above, would address site-specific increases in impervious surfaces and subsequent increases in overland runoff (i.e. from the roof of Building C) by incorporating stormwater control designs into the project to manage the rate at which runoff and associated nutrients leave the site.

Building C – Construction and Demolition

Building C demolition and construction activities would affect approximately 2.6 acres of mostly previously disturbed area, as the new building would be constructed in the area of the demolished Buildings 2, 4, 6, 7, and 8. During demolition and construction, soils would be exposed, creating an increased potential for erosion and/or transport of surface pollutants into adjacent waterbodies. Sediment erosion and/or transport of surface pollutants would be controlled during demolition, construction, and after construction as Building C would have LEED® Silver and LID features. Building C construction would result in 2.6 acres of impervious surface, which would be a decrease of 0.2 acre from the 2.8 acres impervious surface covered by the buildings to be demolished. This decrease in impervious surface would provide beneficial impacts by decreasing both the volume of stormwater runoff and the amount of sediments and pollutants potentially transported to nearby surface waters. Recent stormwater regulations also require the implementation of LID stormwater solutions with the intent to minimize impervious footprints, protect natural vegetation, extend time of concentration, filter and infiltrate stormwater, and store and reuse the runoff, which when implemented would also provide beneficial impacts.

By following BMPs and standard operating procedures (SOPs) with planning and stormwater management improvements, the proposed action would likely result in minimal temporary impacts on surface waters from demolition and construction activities and long-term benefits due to the small decrease in impervious surfaces and enhanced stormwater controls.

Parking Alternatives

- *Underground Parking* - A 225,000 SF underground parking garage would be constructed east of Lake Eleanor with the proposed lower elevation of the garage being between 260 and 270 feet MSL. The surface of Lake Eleanor is at an elevation of 280 feet MSL (NAVFAC, 2011k).

  Due to the presence of relatively shallow bedrock upslope from Lake Eleanor, it is anticipated that the spring that feeds the lake is located within the fractured bedrock aquifer, and is therefore, unconnected to the shallow aquifer that would be intercepted by the proposed underground garage (NAVFAC, 2011k). See Section 4.2.2 for potential impacts on groundwater. As a

result, the underground parking structure would not impact the spring source of Lake Eleanor or the water level of the lake.

Since the parking garage would be underground there would not be any potential increase for the runoff of oil, grease, or antifreeze from vehicles that could affect the water quality of surrounding surface waters when the garage is in operation. Impacts on surface waters during the construction of the underground parking structure would be similar to those for the construction of Building C. Overall, by following BMPs and SOPs during construction implementing this parking alternative would result in only temporary impacts on surface waters during the construction period.

Impacts from surface water related to the following three above-ground parking structure sites would be similar to the impacts described under the construction of Building C. Unlike the underground parking alternative, parking structures under these alternatives would be above ground. Therefore, once the parking structures become operational, these alternatives would increase the potential for runoff of oil, grease, and antifreeze that could affect surface water quality if not controlled. However, parking would be concentrated in a multi-story garage that would minimize the parking footprint and maximize the potential to manage runoff. Appropriate stormwater management measures would be considered during the design phase to address the potential for pollution as part of the required stormwater management plan. Typical measures could include filtration/pollutant removal systems, which could be incorporated into NSA Bethesda's current stormwater conveyance system and into the overall design of the project. Such systems could include the installation of infiltration trenches, underground sand filters, and/or surface sand filters.

- *Warehouse Area Parking* - A parking structure would be built on the north side of Grounds Road in the northeast corner of NSA Bethesda. This new parking structure would require demolishing existing warehouse facilities. Demolition and construction activities under this alternative would affect approximately 0.7 acre of currently developed and pervious area with a net increase of approximately 0.1 acre of impervious surfaces. The nearest waterbody is Stoney Creek approximately 350 feet southeast of the development footprint on the south side of Grounds Road. During demolition or construction, soils would be exposed, creating an increased potential for erosion and/or transport of surface pollutants into Stoney Creek.

  Overall, by following BMPs and SOPs with planning and stormwater management improvements, the actions proposed under this alternative would likely result in minor direct impacts on Stoney Creek. The impacts would be minor because the demolition and construction activities, the increase in impervious surfaces, and

the expected increases in traffic with the new parking structure all generate pollutants, but not in large quantities when proper controls are implemented. As noted in Section 3.2, Stoney Creek is a 303(d) listed stream due to nutrients, sediments, bacteria, and impacts on biological communities. Therefore, given the proximity of Stoney Creek to the project site, strict adherence to sediment and erosion control plans and implementation of appropriate stormwater controls would be necessary to minimize any adverse impacts on this stream.

- *H-Lot Parking* - A parking structure would be built on H-Lot just north of Jones Bridge Road in the south-central portion of the installation. The construction and demolition activities under this alternative would affect approximately 0.9 acre of already developed area with a net increase of between approximately 0.1 and 0.334 acre of impervious surfaces depending on the final location of the parking structure. Stoney Creek is located approximately 250 feet northwest of the development footprint.

  During construction/demolition, vegetation would be removed and soils would be exposed, creating an increased potential for erosion and/or transport of surface pollutants into adjacent waterbodies. There is an existing topographic barrier between the north side of the H-Lot site and Stoney Creek in the form of a raised grassy area and stormwater catchment curbs that capture stormwater as it exits the lot. While the south side of the existing parking lot slopes downward toward Jones Bridge Road, there is an existing topographic barrier in the form of a raised grassy area and stormwater catchment curbs that capture stormwater as it exits this side of H-Lot as well. However, as it is expected that the curbside water catchment systems would be removed during the construction period, BMPs for surface water management would need to be used to mitigate impacts from surface flow to both Stoney Creek and Jones Bridge Road. Impacts on water quality would be reduced in the same manner as described under the warehouse area alternative and as described at the beginning of Section 4.2.1. Overall, by following BMPs and SOPs with planning and stormwater management improvements, because of the smaller increase in impervious area and the longer distance to Stoney Creek, this alternative would result in minimal impacts on Stoney Creek.

- *Taylor Road Facilities Parking* - An above-ground parking structure would be built along the south side of Taylor Road towards the northeast side of the installation and would require the demolition of three buildings (Buildings 28, 53, and 59). The demolition and construction activities under this alternative would affect approximately 0.7 acre of mostly developed area with a net increase of approximately 0.06 acre of impervious surfaces. Stoney Creek is located approximately 60 feet southeast of the development footprint. Overall, with the small net increase in

impervious surfaces and appropriate planning and management measures incorporated into the design of the facility, the actions proposed under this parking alternative would likely result in negligible impacts on Stoney Creek.

Medical Facilities Internal Renovations

No external impacts would be expected from internal renovations; therefore, there would be no impacts on the surface water features of NSA Bethesda.

Temporary Medical Facilities

To allow continued medical services to be provided during the construction of Building C, temporary medical facilities would be placed on G-Lot. The development footprint would impact approximately 3.4 acres of NSA Bethesda; however, there would be no increase in impervious surface because the entire development footprint is currently developed and the structures would be temporary.

Overall, because the temporary medical facilities placed would not increase the amount of impervious surface at the site, implementing the appropriate planning and management measures during the construction and operation of the temporary facilities would likely result in minimal impacts on waterbodies on NSA Bethesda and surrounding areas.

Utilities Upgrades

Various upgrades would be made to utilities on NSA Bethesda that include some building demolition and construction, upgrades to the electrical distribution system, as well as replacement condensate return lines and backup water supply tanks. The total development footprint of the utility upgrades encompasses approximately 0.7 acre (0.1 acre for the cooling towers, and 0.6 acre for the backup water supply) with a net increase in impervious surfaces of approximately 0.6 acre as the cooling towers would be in already developed areas.

The types of impacts from demolition or construction, as well as trenching for replacement of underground utilities, would be similar to those for the accessibility and appearance improvement projects. BMPs and permits required would also be similar. Overall, due to the small increase in impervious area that would result from the utility upgrades and by following BMPs and SOPs with planning and stormwater management improvements, the proposed actions would likely result in negligible direct adverse impacts on Stoney Creek and other surface waterbodies. While the demolition and construction activities and the small increase in impervious surfaces would all generate sediment and other pollutants, they would not be in large quantities when proper controls are implemented. Therefore, the impacts would be minimal.

Accessibility and Appearance Improvement Projects

Various upgrades and improvements to accessibility on NSA Bethesda would be made to infrastructure such as sidewalks and trails. As a result of the improvements, there would be a net increase in impervious surfaces on NSA Bethesda of 0.14 acre. Except for the construction of the asphalt trail along Stoney Creek, none of the improvement projects would occur within proximity to any surface water features. As part of the trail system along Stoney Creek a new bridge would be constructed across the creek and an existing bridge would be replaced. The bridges would completely span the creek with no support structures located in the creek bed itself. Although the Stoney Creek Trail System improvements would introduce new paved area, pervious pavement would be utilized that would reduce impacts from runoff. The total estimated amount of excavation needed for all of the accessibility and appearance improvements projects would be approximately 450 cubic yards.

During demolition and construction activities soils would be exposed, creating a temporary increased potential for erosion and/or transport of sediments and surface pollutants into adjacent waterbodies via the stormwater system or directly through runoff. This is especially true for the construction of the asphalt trail along Stoney Creek and the bridge crossing the creek. Appropriate site-specific erosion and sediment control plans would be prepared to reduce surface erosion and control runoff of pollutants, in compliance with all applicable Federal, state, and local permits.

Localized increases in impervious surfaces associated with the Building 17 Connector, University Entry, and Stoney Creek Trail System upgrades would be small, and there would be an overall small net increase in impervious surface for all of accessibility and appearance improvements combined, following BMPs and SOPs with planning and stormwater management improvements. Therefore, the actions proposed under this alternative would likely result in negligible direct adverse impacts on Stoney Creek and other surface waterbodies. While the demolition and construction activities and the small increase in localized impervious surfaces would all generate sediment and other pollutants, they would not be in large quantities when proper controls are implemented. Therefore, the impacts would be minimal.

Building 13 Renovations

During external renovations to Building 13, there would be minimal ground disturbance within the area of the existing structure and proper controls would be implemented to control sedimentation and other pollutants; therefore, impacts on surface water would be minimal.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, but no new impervious surfaces would be introduced. Erosion and sediment control measures would be implemented to minimize impacts from stormwater runoff. Impacts would be temporary because the areas would be restored to original conditions after construction is completed.

4.2.1.2 Surface Water Impacts: University Expansion

A stormwater management plan would be implemented by NSA Bethesda and approved by MDE before any new construction that could increase impervious surface area takes place. This plan would address site-specific increases in impervious surfaces and subsequent increases in overland runoff (i.e. from the roof of Building F and the parking garage) by incorporating stormwater control designs into the project to manage the rate that runoff and associated nutrients leave the site.

University Expansion – Alternative 1

Under this alternative, the construction of the University Expansion would occur in the forested lot east of Grier Road south of the USU Campus. This construction would require clearing the forested area. The total development site footprint would be approximately 2.8 acres, all of which would convert pervious areas into impervious surfaces.

During demolition or construction, soils on steep slopes on this site would be exposed, creating an increased potential for erosion and/or transport of surface pollutants into adjacent waterbodies. Impacts on Stoney Creek would be minimized because it is located approximately 600 feet north of the project site and is topographically separated from the project site by a raised area of earth upon which South Palmer Road sits. However, University Pond is located just east of the project site and there is no topographic separation between it and the project site. Site-specific BMPs would be implemented to minimize the direct impacts on surface waters.

As discussed, the total net increase of impervious surfaces under this alternative would be approximately 2.8 acres. This increase could increase both the volume of stormwater runoff and the amount of sediments and pollutants transported offsite. However, the LID required by the new stormwater regulations are intended to minimize impacts of impervious footprints, protect natural vegetation, extend time of concentration, filter and infiltrate stormwater, and store and reuse the runoff. Stormwater controls for the proposed action that could be incorporated into the project design, where applicable, include, but are not limited to: bioretention, dry wells,

filter/buffer strips, swales, rain barrels, cisterns, and infiltration trenches.

Impacts on water quality resulting from the expected increase in vehicle parking associated with operation of the parking facility under this alternative would be similar to those under the Parking Alternatives for the Medical Facilities Development. Increases in parking would increase the amount of oil, grease, and antifreeze that could be carried into the waters through runoff. Measures considered to reduce this impact would be the same as those described under the Parking Alternatives for the Medical Facilities Development.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on the sites, but no new impervious surfaces would be introduced. Erosion and sediment control measures would be implemented to minimize impacts from stormwater runoff. Impacts would be temporary because the areas would be restored to original conditions after construction is completed.

Overall, by following BMPs and SOPs with planning and stormwater management improvements, the actions proposed under this alternative would likely result in minimal impacts on surface waters. These impacts would be minor and not significant. While proposed construction activities, an increase in impervious area, and new parking facilities all generate pollutants, they are not generated in large quantities especially when proper controls are implemented.

University Expansion – Alternative 2

Under this alternative, construction of the University Expansion would occur west of the current USU campus in the developed area between USU and AFRRI. The total net increase in impervious surface area under this alternative would be between approximately 0.6 and 1.6 acres depending upon the final design of the building. However, N-Lot and other developed area totaling 1 acre of land presently exist on the site and construction of Alternative 2 on this site would occupy the entirety of the N-Lot. A parking structure similar to Alternative 1 would also be incorporated into the project; however, it would be stacked under Building F, minimizing the amount of building footprint and impervious area. The site is located less than 200 feet south from Stony Creek and, as discussed previously, NSA Bethesda would ensure strict adherence to BMPs and SOPs with planning and stormwater management improvements to minimize the direct impacts on surface waters. These impacts are anticipated to be minor and not significant.

The areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are already disturbed, flat areas. Some ground disturbance would occur as a result of construction staging on

the sites, but no new impervious surfaces would be introduced. Erosion and sediment control measures would be implemented to minimize impacts from stormwater runoff. Impacts would be temporary because the areas would be restored to original conditions after construction is completed.

While the proposed construction activities, the increase in impervious area, and new parking facilities all generate pollutants; they are not generated in large quantities when proper controls are implemented.

University Expansion – Internal Renovations

No external impacts would be expected from internal renovations; therefore, there would be no impacts on the surface water features of NSA Bethesda.

4.2.1.3 Surface Water Impacts: No Action Alternative

Implementation of the No Action Alternative would not alter the current condition of surface water resources on NSA Bethesda, and no additional effects on the resource would occur.

4.2.2 Groundwater

This section assesses the potential effects of the alternative development scenarios on groundwater resources at NSA Bethesda by considering the effects of increased impervious surfaces on groundwater recharge and the potential for impacts on groundwater quality associated with implementing the various alternatives.

4.2.2.1 Groundwater Impacts: Medical Facilities Development

Building C – Construction and Demolition

Building C construction would result in a net decrease in the amount of impervious surfaces on the installation by approximately 0.2 acre, allowing more stormwater to naturally infiltrate the ground than currently does. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the installation allowing infiltration and groundwater recharge to continue.

No significant effects on groundwater quality would be expected as NSA Bethesda would comply with the Spill Prevention, Control and Countermeasures Rule (40 CFR 112) and existing groundwater protection protocols as required under the Safe Drinking Water Act (1974, with amendments 1986). Pursuant to these directives, during the construction of the proposed facility, the project would incorporate specific mitigation measures and construction protocols aimed at minimizing the overall potential for groundwater contamination from hazardous materials associated with construction activities (i.e., oils, lubricants, antifreeze, and fuels) and the overall future

operations of the facility. As a result, groundwater contamination within the proposed project site would not likely occur. Since there would be a net decrease in the amount of impervious surface under this alternative, there would be some small beneficial impacts on groundwater recharges, as more rainwater would be able to naturally infiltrate the ground. Therefore, small, positive impacts on groundwater are expected to occur as a result of this component of the proposed action.

Parking Alternatives

- *Underground Parking* - Under this alternative a 225,000 SF underground parking garage would be constructed east of Lake Eleanor with the proposed lower elevation being between 260 and 270 feet. The surface of Lake Eleanor is at an elevation of 280 feet (NAVFAC, 2011k). In 2011, a hydrogeological investigation was performed to determine if the proposed construction would have any impact on Lake Eleanor and its source spring (NAVFAC, 2011k). During the study, groundwater was encountered at elevations greater than 30 feet. Given the depth of the underground parking structure of approximately 260 to 270 feet below the ground surface, it would intercept the groundwater flow in the shallow aquifer, requiring temporary dewatering systems during construction of the garage and a permanent dewatering system thereafter. Permanent perimeter and under-floor sub-drainage would likely be needed with a dewatering system that would likely outlet collected groundwater to a sump pit(s) installed below the lower floor level of the garage for outlet pumping. This would allow the collected groundwater to reenter the natural groundwater drainage pattern of the area resulting in minimal impacts on groundwater. The type and capacity of any dewatering system would be determined during the design phase of the underground garage facility and would need to take treatment of the collected groundwater into consideration so that any oils, grease, antifreeze, or other pollutants from vehicle traffic in the parking garage do not enter the natural groundwater flow.

  Overall, no significant effects to groundwater quality would be expected and groundwater quality would not likely degrade beyond its current condition because NSA Bethesda would comply with the applicable regulations and existing groundwater protection protocols.

  The hydrogeologic investigation in 2011 also concluded that the recharge zone of the local aquifer is located in the upland area south of Lake Eleanor near Jones Bridge Road (NAVFAC, 2011k). As a result, the underground garage facility and its ingress/egress routes would not impact the groundwater recharge zone.

- *Warehouse Area Parking* - The above-ground warehouse area parking alternative would convert approximately 0.1 acre of pervious

surfaces to impervious development. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue.

Overall, minimal impacts on groundwater quality would be expected and groundwater quality would not likely degrade beyond its current condition because NSA Bethesda would comply with the applicable regulations and existing groundwater protection protocols. The replacement of pervious ground cover with impervious surfaces would not be expected to have significant impacts on groundwater recharge in the area of proposed development because the increase in impervious surface represents only a 0.1-percent increase from the 103 acres that are currently impervious within the installation.

- *H-Lot Parking* - The H-Lot parking alternative would convert approximately 0.1 to 0.334 acre of pervious soil surfaces to impervious development in a mostly developed area. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue.

  For the same reasons discussed under the warehouse area parking alternative, minimal impacts on groundwater quality would be expected. The replacement of pervious ground cover with impervious surfaces would not be expected to have significant impacts on groundwater recharge in the area of proposed development because the increase in impervious surface represents only a 0.1-percent to 0.334-percent increase from the 103 acres that are currently impervious.

- *Taylor Road Facilities Parking* - The Taylor Road Facilities parking garage alternative would convert approximately 0.06 acre of pervious soil surfaces to impervious development (a 0.06-percent increase on the installation) in a mostly developed area. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue. Therefore, the replacement of pervious ground cover with impervious surfaces would not be expected to have significant impacts on groundwater recharge in the area of proposed development.

Medical Facilities Internal Renovations

Interior renovations would have no impacts on groundwater.

Temporary Medical Facilities

The temporary medical facilities would be placed on G-Lot and would not increase or decrease the amount of impervious surface on NSA Bethesda. Precipitation and runoff from the impervious surfaces would be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue. Therefore, there would be no impact on groundwater quality or recharge in the proposed development area from constructing the temporary medical facilities.

Utilities Upgrades

For the utility upgrades, approximately 0.6 acre of pervious soil surfaces would be converted to impervious development. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue.

For the same reasons discussed under the parking alternative, no significant effects to groundwater quality would be expected. The replacement of pervious ground cover with impervious surfaces would not be expected to have significant impacts on groundwater recharge in the area of proposed development, because the increase in impervious surface represents only a 0.6-percent increase from the 103 acres that are currently impervious within NSA Bethesda.

Accessibility and Appearance Improvement Projects

For the accessibility and appearance improvement projects, there would be a net increase of 0.14 acre of impervious surfaces across NSA Bethesda, providing slightly less area for stormwater to naturally infiltrate the ground. Precipitation and runoff from impervious surfaces would continue to be conveyed through stormwater control structures to the natural drainage system, and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue.

For the same reasons discussed under the parking alternatives, no significant effects to groundwater quality would be expected.

Building 13 Renovations

External renovations to Building 13 would be within the area of existing structure. Impacts to groundwater would be similar to those described for the Temporary Medical Facilities.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would not affect groundwater, as ground-disturbing activities would not occur below the surface.

4.2.2.2 Groundwater Impacts: University Expansion

University Expansion – Alternative 1

University Expansion Alternative 1 would have a footprint of approximately 2.8 acres and convert existing forested area to impervious development. As a result of the conversion of forested area to impervious area, the previously undisturbed infiltration area would be lost permanently. However, NSA Bethesda would comply with the applicable regulations and existing groundwater protection protocols to ensure that precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system and manmade bio-filtration systems (e.g., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue.

The increase in impervious surface represents a 2.7-percent increase from the 103 acres that are currently impervious within NSA Bethesda.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would not affect groundwater, as ground-disturbing activities would not occur below the surface.

University Expansion – Alternative 2

University Expansion under Alternative 2 would result in approximately 1.6 acres of impervious surface mostly on the existing N-Lot and other developed areas consisting of 1.0 acre. Precipitation and runoff from impervious surfaces would be conveyed through stormwater control structures to the natural drainage system and manmade bio-filtration systems (i.e., grassed swales) within the watershed allowing infiltration and groundwater recharge to continue.

For the same reasons discussed under University Expansion Alternative 1, no significant effects to groundwater quality would be expected. The replacement of pervious ground cover with impervious surfaces would not be expected to have significant impacts on groundwater recharge in the area of proposed development because the increase in impervious surface represents only a 1.5-percent increase from the 103 acres currently impervious within NSA Bethesda.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the

helipad and the Navy Exchange) would not affect groundwater, as ground-disturbing activities would not occur below the surface.

University Expansion – Internal Renovations

Interior renovations would have no impacts on groundwater.

4.2.2.3 Groundwater Impacts: No Action Alternative

Implementation of the No Action Alternative would not change the current situation at NSA Bethesda regarding groundwater resources and would not impact groundwater resources.

4.2.3 Floodplains

4.2.3.1 Floodplains Impacts: Medical Facilities Development

Construction of Building C, the underground parking garage, the warehouse area parking garage alternative, the H-Lot parking garage alternative, the Taylor Road Facilities parking garage alternative, temporary medical facilities, internal renovations to Buildings 1, 3, 5, 9, and 10, renovations to Building 13, utilities upgrades, and areas proposed for temporary construction material storage would not occur within the 100-year floodplain along Stoney Creek. As a result, no adverse impacts on floodplains would occur from the construction of these components.

Accessibility and Appearance Improvement Projects

None of the projects under this alternative, except for the Stoney Creek Trail System improvements, would be constructed in the 100-year floodplain of Stoney Creek. Portions of the Stoney Creek Trail System upgrades would occur within the 100-year floodplain, though the location and amount of trail within the floodplain would depend on the final design and layout of the trail improvements. The new bridge crossing would also occur within the floodplain. It is important to note that no developed area of NSA Bethesda is located within a FEMA regulated floodplain (FEMA, 2011). While not FEMA regulated, Stoney Creek’s 100-year floodplain was modeled in 1998 (NNMC, 2000). NSA Bethesda’s 100-year floodplain is regulated by Maryland’s COMAR 26.17.4 (Construction on Nontidal Waters and Floodplains) and Federal Executive Order 11988 Floodplain Management. To construct the improvements in the floodplain, a Joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland permit would be required from MDE prior to construction. Given the trail would have no vertical structure to it and the small footprint of the bridge, following any requirements, as stipulated in a permit received from MDE would ensure that there would be no significant impact on the floodplain.

4.2.3.2 Floodplains Impacts: University Expansion

Both alternatives of the construction of the University Expansion, including the parking area and the internal renovations to USU Buildings A, B, and C and the ground floor of the USU would not occur within the 100-year flood plain along Stoney Creek. As a result, no adverse impacts on floodplains would occur from the actions proposed under this alternative.

4.2.3.3 Floodplains Impacts: No Action Alternative

Implementation of the No Action Alternative would not alter the current condition or alter the current delineation of the 100-year floodplain on NSA Bethesda. As a result, no impacts would occur.

4.2.4 Wetlands

4.2.4.1 Wetlands Impacts: Medical Facilities Development

Building C – Construction and Demolition

The construction and demolition associated with the construction of Building C would not occur near the small delineated wetland adjacent to University Pond nor would it occur near the areas identified as potential wetlands associated with Stoney Creek. As a result, there would be no impacts on wetlands under this alternative.

Parking Alternatives

- *Underground Parking* - Similar to the construction of Building C, construction of the underground parking area would not occur near Stoney Creek or the areas associated with it north of Stone Lake Road that have been identified as potential wetlands. It would also not occur near the small delineated wetland adjacent to University Pond. As a result, there would be no impacts on wetlands under this alternative.

- *Warehouse Area Parking* - The warehouse area is not near the wetland associated with University Pond, nor is it in the vicinity of the areas identified in the NNMC INRMP as potential wetlands. Therefore, there would be no impacts on wetlands under this alternative.

- *H-Lot Parking* - H-Lot is not near the wetland associated with University Pond, nor is it in the vicinity of the areas identified as potential wetlands. Therefore, there would be no impacts on wetlands under this alternative.

- *Taylor Road Facilities Parking* – The Taylor Road site is not near the small delineated wetland adjacent to University Pond and would have no impact on it. While the development footprint for the Taylor Road Facilities is approximately 100 feet north of Stoney Creek, an area identified in the NNMC INRMP as potential

wetlands is located adjacent to the south side of the tributary where it makes its closest approach to the Taylor Road Facilities. As with any construction under the proposed action, a General Permit for Construction Activity would be obtained, which would include an approved sediment and erosion control plan. Both this permit and stormwater BMPs would reduce runoff and potential pollutants carried to Stoney Creek and would ensure any potential impacts on the wetland resulting from sedimentation would be minimal and not significant.

Medical Facilities Internal Renovations

There would be no impacts on wetlands as a result of renovating internal spaces.

Temporary Medical Facilities

The temporary medical facilities would not be located in the vicinity of Stoney Creek and its associated areas of potential wetlands or near the delineated wetland associated with University Pond. Therefore, there would be no impacts on wetlands under this alternative.

Utilities Upgrades

None of the utility upgrades would occur in the vicinity of the delineated wetland adjacent to University Pond or in the vicinity of the potential wetland areas. Therefore, there would be no impacts on wetlands as a result of this alternative.

Accessibility and Appearance Improvement Projects

There would be no impacts on delineated wetlands associated with University Pond, since none of the projects under this alternative would be located in that vicinity.

Approximately 0.11 acre of the Stoney Creek Trail System improvements would occur along Stoney Creek in the vicinity of potential wetlands, specifically in the area south of South Palmer Road and north of Stokes Road and in the extreme northeast portion of the northern most potential wetland area north of Stone Lake Road. Maryland requires a 25-foot buffer around wetlands, and the final design layout and construction of the trail improvements in these areas would seek to avoid potential wetland areas, including a 25-foot buffer, to the maximum extent possible. If impacts on potential wetland areas cannot be avoided, then the Navy would comply with DoD’s no net loss policy through participation in an approved off-site mitigation bank or in-lieu fee. A mitigation bank is a wetland, stream, or other aquatic resource area that has been restored, established, enhanced or (in certain circumstances) preserved for the purpose of providing compensation for unavoidable impacts on aquatic resources permitted under Section 404 of the Clean Water Act or local wetland regulations. Upon approval of regulatory agencies, permittees, in this case the

Navy, purchase credits from a mitigation bank to meet their requirements for compensatory mitigation. In-lieu fee mitigation occurs when the permittee (i.e. the Navy) provides funds to an in-lieu fee sponsor (a public agency or non-profit organization) who then builds and maintains the mitigation site. The in-lieu fee sponsor is responsible for the success of the mitigation. Like a mitigation bank, in-lieu fee mitigation is "off-site," but unlike mitigation bank, it typically occurs after the permitted impacts (EPA, nd). No design for the Accessibility and Appearance Improvement Projects has been developed. Therefore, it is not clear that impacts to wetlands would occur, and no mitigation bank or in-lieu fee sponsor has been identified at this time. If the wetland areas would be greater in area than 5,000 square feet or construction would occur on the floodplain, NSA Bethesda would seek the acquisition of a Joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal or Non-tidal Wetland permit from MDE.

Building 13 Renovations

The external renovations associated with Building 13 involve existing structures only; there would be no impacts on wetlands because Building 13 is not located near any wetlands.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are not located in areas containing wetlands; therefore, there would be no impacts on wetlands.

4.2.4.2 Wetlands Impacts: University Expansion

University Expansion – Alternative 1

Construction under this alternative would not occur near Stoney Creek and its associated areas of potential wetlands. The small 0.03 acre wetland associated with University Pond is located on the northeast side of the pond; tree clearing and construction under this alternative would occur west of the pond and would not impact the wetland. Additionally, as with any construction under the proposed action, a General Permit for Construction Activity would be obtained, and would include an approved sediment and erosion control plan. This plan and stormwater BMPs would reduce runoff and potential pollutants carried to University Pond, preventing any potential impacts on the wetland on the northeast side of the pond. The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are not located in areas containing wetlands; therefore, there would be no impacts on wetlands.

University Expansion – Alternative 2

Construction under this alternative would not occur near Stoney Creek and its associated areas of potential wetlands. It would also not occur near University Pond and the small 0.03 acre wetland along the northeast side of the pond. The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are not located in areas containing wetlands. Therefore, there would be no impacts on wetlands under this alternative.

University Expansion – Internal Renovations

Internal renovations would not have any impacts on wetlands.

4.2.4.3 Wetlands Impacts: No Action Alternative

No new construction or ground-disturbing activities in the vicinity of Stoney Creek or the associated areas of potential wetlands would occur. Therefore, no impact on wetlands would occur as a result of implementing the No Action Alternative.

4.3 Biological Resources Consequences

4.3.1 Vegetation

4.3.1.1 Vegetation Impacts: Medical Facilities Development

Building C – Construction and Demolition

The proposed new construction and demolition would be conducted on lands with either existing development or landscaped (lawn) areas with scattered trees, such as oaks or maples (see Section 3.3.1.1). For the 2.6 acres of impervious area for Building C, approximately 0.1 acre of currently landscaped area with scattered trees would be converted to impervious surfaces. Impacts on vegetation would not be significant because the project areas are in the highly developed area of the Medical Center. Landscaped vegetation surrounding the Medical Center contains lawn with scattered trees and shrubs, with species commonly found within the region. Natural plant communities in this area have low vegetative diversity.

Existing vegetation within the footprint of the proposed Building C would be removed during construction, although large trees would be preserved to the greatest extent possible. Sites considered for re-development that contain areas of maintained lawn with scattered planted trees would be reseeded with grass and replanted with native vegetation, where possible, around the new building. Landscaping would provide a positive impact on vegetation, which would provide some habitat once construction is complete.

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C would require development of a small vegetated area located

immediately north of Building 4 and southwest of Building 2 (0.1 acre). However, no significant impacts on vegetation would be expected from demolition activities and construction of Building C.

Parking Alternatives

- *Underground Parking* - Construction of the underground parking lot underneath the Front Lawn west of Building 1 would utilize open excavation and temporarily remove approximately 2.6 acres of mowed lawn. Once construction is completed, the area would be reseeded with grass and returned to mowed lawn.

- *Warehouse Area Parking* - Construction of the above-ground parking garage at the warehouse area site could permanently impact less than 0.05 acre of landscaped vegetation and 0.04 acre of natural woodlands, including trees such as cedars, maples, and oaks (see Section 3.3.1.2).

- *H-Lot Parking* - Construction of the above-ground parking garage at the H-Lot parking site could permanently impact less than 0.3 acre of landscaped vegetation and 0.05 acre of forests.

- *Taylor Road Facilities Parking* - Construction of the above-ground parking garage at the Taylor Road Facilities site could permanently impact less than 0.04 acre of landscaped vegetation and 0.01 acres of forests.

No significant adverse impacts on vegetation would be expected from implementing any of the parking alternatives. Forested areas that are permanently removed to accommodate construction of the parking facilities (at the warehouse area or Taylor Road Facilities) would include tree protection components that are a part of the LEED® Silver standard and would likely involve the use of vegetative barriers and landscaping.

Medical Facilities Internal Renovations

Internal renovations would occur within existing Buildings 1, 3, 5, 9, and 10, and would not impact any vegetation.

Temporary Medical Facilities

Siting of the temporary medical facilities on the existing G-Lot would not result in any impacts on vegetation since the entire site is covered with asphalt and no vegetation is present.

Utilities Upgrades

Demolition and reconstruction of three existing cooling towers and construction of a fourth tower would occur at the site of the existing cooling towers. Other utility upgrades, such as the replacement of deteriorating condensate return lines, reparation of damaged water lines, and electrical distribution system, would occur throughout the installation, primarily along roads or in developed areas with landscaped vegetation. Impacts would primarily be limited to landscaped vegetation. Temporary impacts on vegetation would occur, but would not be significant. Once construction activities are completed, the impacted areas would be reseeded with grass and replanted with native vegetation, where possible. No impacts on forests or areas with natural vegetation are expected to occur from the utilities upgrades.

Accessibility and Appearance Projects

Improvements would include additional landscaping, which would enhance existing landscape on the installation. In addition, this project would enhance the on-going landscape improvement plan for the Medical Center. Tree clearing for the Stoney Creek Trail System project would be limited because the fully accessible trail would follow the existing trail along a portion of the route; species that could be impacted are described in Section 3.3.1.1). Bridge construction and replacement could result in some permanent losses of vegetation in the area where piles are placed, but these impacts would be minor. Temporary impacts on existing landscaped vegetation would be expected from the widening/realignment of sidewalks. However, these areas would be reseeded and landscaped after construction is complete. No significant impacts on vegetation would be expected from these proposed projects.

Building 13 Renovations

Renovations would occur to the existing building, and would not impact vegetation.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are located in areas that are already disturbed. The area near the helipad and Navy Exchange contains grassy vegetation that would be damaged or lost from placement of construction materials on the site; but the impacts would be temporary.

4.3.1.2 Vegetation Impacts: University Expansion

University Expansion – Alternative 1

Under University Expansion Alternative 1, up to 4.2 acres of forested area and trails could be affected with 2.8 acres converted to permanent impervious surface. These 4.2 acres represent approximately 11 percent of the 38 acres of forested lands within the installation. These lands have value by providing water filtration and habitat within this relatively undisturbed area of the base. The forested areas contain mature woods with many large trees, including several yellow poplars that are over 100 feet tall. Spicebush is the dominant native shrub that would be removed. The actual total acreage of forested lands and vegetation disturbed would depend upon the design and layout of the different structures or facilities. The specific location and total area disturbed will not be known until the design phase of the project; however, the calculations of disturbed forested lands included here represent a most severe-case scenario. The loss of this area would represent a permanent impact for this forested area. However, once construction activities are completed, the impacted areas would be reseeded with grass and replanted with native vegetation, where possible.

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are located in areas that are already disturbed. The area near the helipad and Navy Exchange contains grassy vegetation that would be damaged or lost from placement of construction materials on the site; but the impacts would be temporary.

University Expansion – Alternative 2

Under University Expansion Alternative 2, up to 1.7 acres of maintained lawn and 0.3 acres of wooded buffer between the University and AFRRI could be impacted. However, the garage and building footprint at approximately 1.6 acres would be mostly located on the N-Lot, an already developed area. The 0.3 acre of a stand of trees that was previously part of the forested area on NSA Bethesda but now resides in a more urban environment represents approximately 1.3 percent of the 38 acres of forested lands at NSA Bethesda. It has value by providing water filtration. If the 0.3-acre wooded buffer were to be impacted, its loss, while not significant given its relatively small size, would represent a long-term impact for this heavily developed area. Impacts from temporary construction material storage would be the same as those for Alternative 1.

University Expansion – Internal Renovations

Internal renovations would occur within existing buildings, and would not impact vegetation.

4.3.1.3 Vegetation Impacts: No Action Alternative

No impacts would be expected to occur to vegetation. Under the No Action Alternative, NSA Bethesda would not implement the proposed actions or projects. The Medical Facilities Development and University Expansion would not occur on any of the alternative sites and no impacts on vegetation would occur.

4.3.2 Wildlife and Wildlife Habitat

The proposed actions, including the Medical Facilities Development and University Expansion, would convert forested and landscaped areas to impervious surfaces. This conversion would result in a potential loss of habitat for wildlife on the installation, temporary and permanent displacement of wildlife, and may also result in direct mortality of some non-mobile species. The subsections below discuss impacts on wildlife habitat in detail. Section 4.3.4 discusses potential impacts on threatened and endangered species and species of special concern.

4.3.2.1 Wildlife and Wildlife Habitat Impacts: Medical Facilities Development

Building C – Construction and Demolition

The proposed new construction and demolition would be conducted on lands with either existing development or on landscaped (lawn) area with scattered trees. The construction of Building C would result in 2.6 acres of impervious surface area, which is a decrease of 0.2 acre from the previous 2.8 acres of impervious surface area covered by the demolished buildings. Impacts on wildlife and wildlife habitat would not be significant because the project area considered for this component of the Medical Facilities Development is for the most part developed or has been previously altered, and the area is not considered to have important wildlife habitat values.

It is expected that the few urbanized birds and small mammals that can be found on the proposed project sites would be temporarily displaced from areas within or immediately surrounding construction areas due to loss of habitat and noise from construction and demolition activities. Species affected by the construction and demolition would most likely be generalist migratory bird species such as northern cardinal, common grackle, and tufted titmouse, as well as non-native species not protected by the MBTA, such as house sparrow and European starling. Common mammals such as gray squirrel could also be affected (see also Section 3.3.1). Wildlife residing on and in the vicinity of the proposed project site may be affected by construction and demolition noise, but these impacts would be temporary and would not result in significant impacts on wildlife. Once the noise has ceased, wildlife would most likely return to the area. Less mobile species (for instance, ground-dwelling insects and small amphibians, such as chorus frog) and individuals (such as juvenile amphibians or larval insects) may experience direct mortality from ground-disturbing activities.

After construction is completed, it is expected that some of the displaced species, particularly birds, would return and use the open areas adjacent to the developed areas. Demolition and construction of Building C would require development of a small 0.1-acre landscaped (lawn) area with scattered trees, resulting in minimal impacts on wildlife and wildlife habitat.

Impacts on wildlife and wildlife habitat from operation of Building C would be negligible. The area where Building C construction and demolition activities would occur is already disturbed and ambient noise levels would not increase noticeably over existing conditions once Building C becomes operational.

Parking Alternatives

- *Underground Parking* - Construction of the underground parking garage underneath the Front Lawn west of Building 1 would utilize open excavation and temporarily remove approximately 2.6 acres of mowed lawn. There would be temporary impacts on the wildlife (see Building C – Construction and Demolition), particularly resident Canada geese that utilize this lawn area. Should any take of Canada geese eggs or nest be deemed necessary, the action would occur under the stipulations of NSAB's permit with the USFWS. Individuals would be temporarily displaced within or immediately surrounding construction areas. Once construction is completed, the area would be reseeded with grass and returned to mowed lawn.

- *Warehouse Area Parking* - No impacts on wildlife or wildlife habitats would be expected to occur under this alternative because construction would occur in an already developed area.

- *H-Lot Parking* - No impacts on wildlife or wildlife habitats would be expected to occur under this alternative because construction would occur in an already developed area.

- *Taylor Road Facilities Parking* - No impacts on wildlife or wildlife habitats would be expected to occur under this alternative because construction would occur in an already developed area.

Minor impacts on wildlife could occur from operation of the parking facilities due to an increase in vehicular traffic and an overall increase in noise in these areas; however, impacts would be expected to be minor. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity.

Medical Facilities Internal Renovations

Internal renovations would occur within existing Buildings 1, 3, 5, 9, and 10, and would not impact wildlife or wildlife habitat.

Temporary Medical Facilities

The temporary medical facilities would be sited on the existing G-Lot. No impacts on wildlife habitat would occur since the site is covered with asphalt and does not contain any wildlife habitat. Impacts on wildlife utilizing adjacent forest habitat, including migratory birds, would be minimal and temporary. It is expected that birds and small mammals that utilize the forested areas adjacent to G-Lot may be temporarily displaced due to installation activities associated with the temporary facilities. After construction is completed, it is expected that the displaced species would return to use the areas adjacent to G-Lot. Species utilizing the forest habitat could include migratory birds such as downy woodpecker, blue jay, northern flicker, and eastern wood-pewee and mammals such as gray squirrel and opossum.

Impacts on wildlife and wildlife habitat from operation of the temporary medical facilities would be expected to be negligible. There would be an increase in human activity at the temporary facilities, but noise levels would not noticeably increase above ambient conditions.

Utilities Upgrades

Construction of the cooling towers would occur at the site of the existing cooling towers. Other utility upgrades (replacement of deteriorating condensate return lines, reparation of damaged water lines, and electrical distribution system) would occur throughout the installation, primarily along roads or in developed areas with landscaped vegetation. Impacts on wildlife and wildlife habitat would be similar to those that would occur from the demolition and construction of Building C. Wildlife that is temporarily displaced during construction would be expected to return once construction activities are complete.

Accessibility and Appearance Projects

Tree clearing for the Stoney Creek Trail System project would be limited because the fully accessible trail would mostly follow the existing trail. It is expected that some wildlife would be temporarily displaced from areas within or immediately surrounding the construction area of the sidewalk widening. After construction is completed, it is expected that most of the displaced species would return to the forested area around the trail, though some may not because this area would be more developed than it previously was. However, as all species that would be impacted by this component of the proposed action are common to the area and no unique habitat areas would be affected, the impacts on wildlife as a result of the construction of this component of the Medical Facilities Development are expected to be minor.

Minor operational impacts could occur to wildlife due to increased use of the Stoney Creek Trail System after it has been improved. There

could be some disturbance to migratory birds in the vicinity of the new trail, but noise levels would not be expected to increase to a level that would result in permanent disturbance of these species.

Building 13 Renovations

Renovations would occur to the existing building, and would not impact wildlife or wildlife habitat, including migratory birds.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would have minimal impacts on wildlife, since the areas are already disturbed. Nearby wildlife could be disturbed during operation of the storage areas, due to an increase in noise from vehicles and personnel accessing the sites. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity.

4.3.2.2 Wildlife and Wildlife Habitat Impacts: University Expansion

University Expansion - Alternative 1

Under University Expansion Alternative 1, adverse impacts on wildlife would be expected. The majority of wildlife species that occupy the project areas are typical of those associated with similar forest habitats occurring on the installation and in the region. Examples of birds that could be affected include house sparrow, common grackle, European starling, blue jay, wood thrush, eastern towhee, and woodpeckers. Other wildlife that could be affected includes gray squirrel, white-tailed deer, and common amphibians and reptiles. Implementing the University Expansion would result in direct loss of non-mobile species of wildlife through construction activities, as well as permanent displacement of wildlife through loss of habitat.

Under this alternative, up 4.2 acres of forested area and trails could be affected, although the actual total acreage disturbed would depend on the design and layout of the different facilities. The permanent impervious footprint is estimated to be approximately 2.8 acres. Construction and operation of the University Expansion facilities would result in the temporary and permanent alteration of wildlife habitat, as well as have a direct impact on wildlife species, which would include the increased disturbance, displacement, and mortality of some species. The clearing of forest vegetation would reduce cover, nesting, and foraging habitat for some wildlife, including some migratory birds and others that are resident species. During construction, more mobile species would be temporarily displaced from the project sites to similar habitats nearby. Some displaced wildlife would return to the newly disturbed area and adjacent undisturbed habitats soon after construction is completed. Birds would return and

use the open areas adjacent to the developed areas. Less mobile species, such as small mammals, reptiles, and amphibians, as well as bird nests located in the trees to be removed, could be destroyed by construction activities.

Direct loss and segmenting of existing on-base forest habitat for wildlife would occur as a result of clearing for development. Construction impacts of up to 4.2 acres of forested area and trails and conversion of 2.8 acres of forest lands to impervious structures and surfaces as well as landscaped area would diminish its value as wildlife habitat. Due to a low possibility of FIDS nesting at NSA Bethesda, as those species require mature forests with a closed canopy that remains fairly undisturbed, it is unlikely that there would be the possibility of loss of those species. Loss of mast-producing forested areas would result in a reduction in food available for species that depend on the resource. In addition, segmenting this larger tract of contiguous forest on-base would result in a reduction of available area for species movement. The resulting developed clearing could increase the diversity of edge habitat by encouraging native shrubs, grasses, and forbs to establish in these areas. Some wildlife use of landscaped vegetation surrounding developments could occur.

Open space scattered throughout the installation that is maintained as grassy areas has limited value as wildlife habitat, due to the lack vegetative cover. Larger forested parcels on the installation, such as the forested area considered under University Expansion Alternative 1, have greater habitat value because they are more likely to sustain a variety of species.

Minor impacts on wildlife could occur from operation of the University facilities due to an increase in human activity and vehicular traffic in the area; however, impacts would be expected to be minor. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity.

University Expansion – Alternative 2

Under University Expansion Alternative 2, up to 1.7 acres of maintained lawn and 0.3 acre of wooded buffer between the University and AFRRI could be impacted. However, the garage and building footprint at approximately 1.6 acres would be mostly located on the N-Lot, an already developed area. Wildlife and wildlife habitat would be impacted but the impacts would be minimal because most of this site has been previously altered since it is composed mainly of N-Lot and landscaped areas, and the area does not have the potential to provide high quality wildlife habitat. Wildlife use in the area would be minimal and transient in nature due to the lack of natural habitat.

Construction activities could impact 0.3 acre of wooded buffer, and wildlife species that occur in adjacent forested areas could be disturbed as a result of increased noise from construction.

Disturbance would be minimal because the wildlife species that do occur in the area would be limited, and they are adapted to the noise conditions associated with the surrounding land uses since the site is located between AFRRI and USU. Any disturbance resulting from construction would be short-term and would last only during the construction process. Wildlife disturbed by noise from the construction process would be expected to relocate from the immediate area and adjacent areas. Many of these species would be expected to return to the area following the completion of construction activities because they are adapted to developed areas.

Minor impacts on wildlife could occur from operation of the University facilities due to an increase in human activity and vehicular traffic in the area; however, impacts would be expected to be minor. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity.

University Expansion – Internal Renovations

Internal renovations would occur within existing buildings, and would not impact wildlife or wildlife habitat, including migratory birds.

Construction Material Storage

The three areas that are proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) would have minimal impacts on wildlife, since the areas are already disturbed. Nearby wildlife could be disturbed during operation of the storage areas, due to an increase in noise from vehicles and personnel accessing the sites. Wildlife in the vicinity of these areas would relocate to other areas or become used to the increase in human activity.

Neotropical Migratory Birds and Forest Interior Dwelling Species

As discussed above, the proposed actions would result in some adverse impacts on wildlife, including migratory birds and negligible impacts on FIDS; however, these impacts would not be significant and would not be expected to adversely impact the overall populations of these species. Impacts would primarily result from habitat loss, noise from construction and demolition activities, and increased vehicular traffic. Additionally, loss of forested habitat from the proposed University Expansion would reduce some food sources and available breeding and nesting sites, as well as reduce overall area for movement.

Development of previously disturbed areas is not expected to result in a take of any bird species covered under the MBTA (with the exception of Canada geese, for which NSAB has a permit from the USFWS that allows eggs or nests of resident geese to be destroyed to prevent overpopulation, should it be needed). At NSAB, restricting development to the existing footprint to the greatest extent practicable and

preserving as much undeveloped land as possible is the primary measure that will avoid take of migratory birds. However, should it is determined that a take of migratory birds is necessary; NSAB will obtain all applicable permits.

Although no federally-listed rare or threatened migratory bird species were observed, a number of the species are considered rare or species of conservation concern by the MDNR Wildlife and Heritage Service, Natural Heritage Program. However, as described in Section 4.3.4, impacts on threatened and endangered species or species of special concern are not anticipated from the proposed actions, as none occur within the proposed project sites.

Operational impacts would result primarily from an increase in vehicular traffic and noise associated with increased human activity from the proposed developments, including the parking facilities and University Expansion. However, noise impacts would not substantially increase over ambient noise conditions, given the already urbanized environment in the vicinity of the proposed project locations.

While there would be some impacts on individual species, overall population levels would not be affected by the proposed actions and therefore, impacts on migratory birds and FIDS would not be significant.

4.3.2.3 Wildlife and Wildlife Habitat Impacts: No Action Alternative

No adverse effects would be expected to occur to wildlife. Under the No Action Alternative, NSA Bethesda would not implement the proposed actions. The Medical Facilities Development and University Expansion would not occur on any of the alternative sites and no adverse impacts on wildlife would occur.

4.3.3 Aquatic and Wetland Habitat

4.3.3.1 Aquatic and Wetland Habitat Impacts: Medical Facilities Development

All but one of the components for Medical Facilities Development are located in areas outside aquatic or wetland habitat areas and are not located within the 25-foot buffer for non-tidal wetlands, as required by Maryland law. Only portions of the improvements to the Stoney Creek Trail System would be constructed within the 25-foot buffer zone of Stoney Creek. Additionally, two bridges, one to replace an existing bridge and one new bridge, would also be constructed over the creek. However, impacts that this project would have on aquatic and wetland habitats and the species using those habitats from temporary siltation would be minimized as BMPs such as silt fences or mats for construction equipment could be used to limit the impacts and no permanent features of the bridges would be placed within Stoney Creek. During the removal of the existing bridge, some aquatic species utilizing the habitat near the bridge could be permanently lost,

particularly those that are not mobile. However, the majority of the impacts are expected to be temporary, with most lasting only through the construction period. Some permanent impacts from loss of habitat around Stoney Creek could occur in the areas around the foundations for the foot bridges that would be constructed. However, no portion of the bridge would be located within the creek and the permanent impacts would cover a relatively small area and would therefore be considered minimal. Species utilizing these areas around Stoney Creek would primarily include amphibians and invertebrates such as worms, snails, insects, and crustaceans.

The Medical Facilities Development, with all the components, would increase impervious surface area at NSA Bethesda by up to 0.52 acre. This small increase in impervious surface covers up to approximately 0.5 percent of the existing 103 acres of impervious surface area at NSA Bethesda because most projects associated with the Medical Facilities Development would be located in already developed areas.

However, during construction, vegetation would be removed and soils would be exposed, creating an increased potential for erosion and/or transport of surface pollutants into adjacent waterbodies affecting aquatic habitat quality. Implementation of erosion and sediment control plans under a General Construction Permit would reduce erosion of exposed soils, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter downstream water flow. Increases in surface runoff during construction and operation would be controlled by stormwater BMPs as well as erosion and sedimentation controls to reduce potential impacts on adjacent land and waters (see Section 4.2, Water Resources Consequences). A net decrease in the speed and volume of stormwater would be expected after construction because 20 percent of the stormwater flow from areas that were previously impervious as well as the new impervious area would now be managed with BMPs in a stormwater management plan approved by the state. Maryland’s recommended BMPs are listed in Section 4.2.1. Wet ponds may be attractive to waterfowl and provide habitat for waterfowl, which would be considered in the decision-making process for implementation of stormwater BMPs.

4.3.3.2 Aquatic and Wetland Habitat Impacts: University Expansion

University Expansion – Alternative 1

This alternative site does not provide habitat for aquatic species or contain 25-foot buffer zones for non-tidal wetlands. However, up to 4.2 acres of forested area and trails could be impacted by the construction of the University Expansion on this site, of which, based on initial building footprint discussions, 2.8 acres could be new permanent impervious surface. There would be no impacts to aquatic and wetland habitat from temporary storage of construction materials at the three designated locations.

University Expansion – Alternative 2

This alternative site does not provide habitat for aquatic species or contain 25-foot buffer zones for non-tidal wetlands. However, up to 0.3 acre of forested land and 1.7 acres of landscaped area would be impacted, portions of which, based on initial building footprint discussions, would create a total of between approximately 0.6 and 1.6 acres of new permanent impervious surface. There would be no impacts to aquatic and wetland habitat from temporary storage of construction materials at the three designated locations.

Under either Alternative 1 or Alternative 2, implementation of erosion and sediment control plans would reduce erosion of exposed soils, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter downstream water flow. Increases in surface runoff during construction and operation would be controlled by stormwater BMPs as well as erosion and sedimentation controls to reduce potential impacts on adjacent land and waters (see Section 4.2, Water Resources Consequences). A net decrease in the speed and volume of stormwater would be expected after construction because 20-percent of the stormwater flow from areas that were previously impervious as well as the new impervious area would now be managed with BMPs in a stormwater management plan approved by the state. Maryland's recommended BMPs are listed in Section 4.2.1 (NNMC, 2000). This stormwater management plan is required by the MDE.

University Expansion - Internal Renovations

Internal renovations to USU Building A, B, and C and the ground floor of the USU would occur within the existing buildings, and therefore, would not impact aquatic or wetland habitat.

4.3.3.3 Aquatic and Wetland Habitat Impacts: No Action Alternative

No adverse impacts would be expected to the aquatic and wetland habitat under the No Action Alternative. NSA Bethesda would not implement the proposed actions. The Medical Facilities Development or University Expansion would not be constructed on any of the alternative sites and no adverse impacts would occur.

4.3.4 Threatened & Endangered Species and Species of Special Concern

ESA (16 U.S.C. 1531 et seq.) mandates that all Federal agencies consider the potential effects of their actions on species listed as threatened or endangered (T&E). The Navy contacted USFWS and MDNR on 11 October 2011 to request a list of endangered or threatened species that have the potential to occur at NSA Bethesda. USFWS has determined that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area (USFWS, 2011). Therefore, the Navy is not required to consult with USFWS to satisfy Section 7 of ESA. Should Federal endangered or threatened transients be discovered within the

proposed project areas during construction, the Navy would adhere to all requirements under ESA. MDNR has determined that there are no state or Federal records for rare, threatened, or endangered species within the boundaries of the project sites, and therefore, the agency does not have specific comments or requirements pertaining to protection measures at this time (MDNR, 2011).

4.3.4.1 T&E Species Impacts: Medical Facilities Development

No impacts on rare, threatened, and endangered species would be expected from implementation of the proposed Medical Facilities Development because there are no special-status species inhabiting either NSA Bethesda or the proposed project sites.

4.3.4.2 T&E Species Impacts: University Expansion

No impacts on rare, threatened, and endangered species would be expected from the implementation of the proposed University Expansion because there are no special-status species inhabiting the proposed project sites or at NSA Bethesda.

4.3.4.3 T&E Species Impacts: No Action Alternative

Under the No Action Alternative, NSA Bethesda would not implement the proposed actions. Medical Facilities Development or University Expansion would not occur on any of the alternative sites and no adverse impacts would occur.

4.4 Air Quality Consequences

An impact analysis was performed to assess air quality effects resulting from construction and operation of the proposed actions. This study provides findings on ambient air quality concentrations and compliance with the regulations and standards promulgated under the Clean Air Act Amendments, and regulations found in the COMAR. The project design, build scenario, and traffic data utilized in the air analysis are consistent with the information used in the traffic study for the proposed actions.

A project construction-related and operations-related General Conformity Rule applicability analysis has been performed that evaluated the proposed Medical Facilities Development with the parking alternatives and University Expansion alternatives. The applicability analysis estimated the level of potential air emissions for the ozone precursor pollutants NO_x and VOCs, for $PM_{2.5}$, and the $PM_{2.5}$ precursor pollutant SO_2, and for CO, to analyze impacts on air quality. The *de minimis* values for moderate nonattainment ozone areas in an ozone transport region, areas in nonattainment for $PM_{2.5}$ are 100 TPY for NO_x, $PM_{2.5}$, and SO_2, and 50 TPY for VOCs, and 100 TPY in maintenance areas for CO.

A separate analysis was performed for each of the proposed actions based on the expected level of construction- and operations-related activities. It is assumed that the No Action Alternative would have no

impact on air quality other than that which currently exists; therefore, it was not included in the analysis. Appendix B contains a detailed description of the assumptions and methodology used to estimate potential emissions for each alternative.

Emissions have been estimated based on square footage and known building footprints for construction, demolition, and operations and are based on assumed staff increases and building energy requirements. Descriptions of construction, demolition, and operational parameters can be found in Appendix B.

4.4.1 Air Quality Impacts during Construction and Operation Periods

Construction of the Medical Facilities Development projects is estimated to begin in 2013 and be completed by 2018 and construction of the University Expansion is expected begin in 2017 and be completed in 2018. However, a conservative approach was employed in the applicability analysis to assure that construction scheduling would not result in higher levels of emissions than predicted.

Period 1, beginning during calendar year 2013, includes all appearance and accessibility projects, installation of temporary medical facilities, electrical upgrades, and excavation for the medical facility parking garage for the underground alternative or demolition of buildings at the site of the above-ground parking alternative (the Taylor Road Facilities site with largest demolition requirement is assumed for the analysis). Although Period 1 is scheduled to occur over approximately 2 years, the analysis conservatively assumes all emissions occur over the same year.

Period 2, beginning during calendar year 2015, includes demolition of buildings on the site of proposed Building C and the construction of Building C, construction of the medical facility parking garage – either underground or above-ground, all medical facility renovation, construction of the new utility plant, renovation of Building 13, demolition of three existing cooling towers and replacement construction of these plus a new fourth tower, additional upgrades to utilities (replacement of condensate return lines, repair of damaged water lines, and installation of water tanks for emergency backup), and all University Expansion actions (construction of Building F, construction of a parking structure, and renovation of space in the existing university buildings). Although Period 2 is scheduled to occur over approximately 3 years, the analysis conservatively assumes all emissions occur over the same year.

Period 3 includes the full operation of all newly constructed buildings and represents the annual emissions from the proposed actions.

4.4.1.1 Air Quality Impacts: Medical Facilities Development

The air quality impacts associated with the construction and operation phases for the Medical Facilities Development, including Building C

(demolition and construction), utilities upgrades, accessibility and appearance improvements, temporary medical facilities, and building renovations are analyzed together and presented with two parking alternatives: underground and above-ground.

Underground Parking

Table 4-1 summarizes the total emissions associated with the construction and operation phases for the Medical Facilities Development with underground parking. Construction related emissions would be temporary and only occur during the construction period.

Table 4-1: Total Annual Emissions: Medical Facilities Development (Underground Parking)

Construction and Operations	Total Emissions (TPY)				
	NO_x	VOC	$PM_{2.5}$	SO_2	CO
***de minimis* thresholds**	**100**	**50**	**100**	**100**	**100**
Period 1	**4.802**	**0.365**	**1.890**	**0.111**	**1.830**
Period 2	**18.960**	**5.217**	**2.005**	**0.542**	**10.426**
Period 3 (Full Operation)	**4.191**	**0.923**	**0.154**	**0.012**	**14.930**

Above-Ground Parking

Table 4-2 summarizes the total emissions associated with the construction and operation phases for the Medical Facilities Development with above-ground parking. The air quality impact analysis examines the impacts on air quality from the Medical Facilities Development with the parking structure at the Taylor Road Facilities as the representative above-ground parking garage and it is assumed to be the above-ground parking garage alternative site with the highest anticipated emissions of all the above-ground sites. Therefore, the air quality impacts from the Medical Facilities Development with the other above-ground parking structures would be similar, if not less, than the impacts with this above-ground parking structure.

Table 4-2: Total Annual Emissions: Medical Facilities Development (Above-ground parking)

Construction and Operations	Total Emissions (TPY)				
	NO_x	VOC	$PM_{2.5}$	SO_2	CO
***de minimis* thresholds**	**100**	**50**	**100**	**100**	**100**
Period 1	**0.765**	**0.073**	**0.195**	**0.020**	**0.399**
Period 2	**18.960**	**5.217**	**2.005**	**0.542**	**10.426**
Period 3 (Full Operation)	**3.676**	**0.881**	**0.143**	**0.011**	**14.435**

As shown in Table 4-1 and Table 4-2, emissions associated with constructing and operating the Medical Facilities Development and the parking alternatives, when compared to the *de minimis* values for an area that is in moderate nonattainment for ozone, nonattainment for $PM_{2.5}$, and maintenance for CO established in 40 CFR 93.153 (b), fall

below the *de minimis* values. Therefore, the Medical Facilities Development would have no significant, adverse impacts on air quality.

A Record of Non-applicability (RONA) is provided in Appendix B.

4.4.1.2 Air Quality Impacts: University Expansion

University Expansion - Alternatives 1 and 2

Similar to the Medical Facilities Development, construction-related emissions would be temporary and only occur during the construction period. Alternative 2 of the proposed University Expansion is similar to Alternative 1, but alters the placement of Building F and the associated parking garage. Alternative 2 would be located west of the University campus in the developed area between the University and AFRRI. Therefore, there are two alternative options for Period 2, when all University Expansion construction would be expected to occur. Period 3, full operation, would be the same for both alternatives because they would include the same amount of total square footage. Table 4-3 summarizes the total emissions associated with the construction and operation phases for Alternatives 1 and 2.

Table 4-3: Total Annual Emissions: University Expansion (Alternatives 1 and 2)

Construction and Operations	Total Emissions (TPY)				
	NO_x	VOC	$PM_{2.5}$	SO_2	CO
***de minimis* thresholds**	**100**	**50**	**100**	**100**	**100**
Period 2 (Alternative 1)	**7.874**	**1.094**	**0.720**	**0.229**	**4.221**
Period 2 (Alternative 2)	**7.804**	**1.089**	**0.699**	**0.227**	**4.205**
Period 3 (Full Operation – both Alts)	**0.678**	**0.066**	**0.045**	**0.003**	**0.521**

As shown in Table 4-3, emissions associated with constructing and operating the University Expansion alternatives, when compared to the *de minimis* values for an area that is in moderate nonattainment for ozone; nonattainment for $PM_{2.5}$, and maintenance for CO established in 40 CFR 93.153 (b), fall below the *de minimis* values. Therefore, the University Expansion would have no significant adverse impacts on air quality.

A RONA is provided in Appendix B.

4.4.2 Air Permit Requirements

Emergency generators for Building C and the parking garage are expected to require a modification to NSA Bethesda's Title V permit, either as permitted sources if they are more than 500 brake horsepower or as registered sources if they are smaller than 500 brake horsepower. Generator specifications are not yet known; however, reasonable size estimates for the generators were made for the air quality analysis. All assumptions are provided in Appendix B. Given current annual emissions and projected emissions, it is expected that under any combination of the proposed actions, the current Central

Utility Plant (CUP) would continue to emit less than 75 TPY NO_x, as required by the Title V permit.

4.4.3 Construction and Operations Air Impact Conclusions for the Medical Facilities Development and University Expansion

The emissions associated with construction and operation under either of the proposed actions, when compared to the *de minimis* values for VOCs, NO_x, $PM_{2.5}$, CO, and SO_2, fall below the *de minimis* values. Therefore, a full conformity determination is not required for either of the proposed actions. The Navy has provided a RONA in Appendix B.

4.4.4 Greenhouse Gases Impacts

Short-term construction and long-term operation of the proposed actions would generate emissions of GHGs. Construction-related GHG emissions would be associated with vehicle engine exhaust from construction equipment and vendor trips. Operational emissions would be associated with area, mobile, and stationary sources. Area-source emissions would be produced from the maintenance of landscaping and grounds. Mobile-source emissions of GHGs would include employee vehicle trips to and from the site. In addition, an increase in stationary-source emissions would occur associated with the additional load on the CUP and additional generators.

GHG emissions generated by the proposed actions would predominantly consist of CO_2. Although emissions of other GHGs such as CH_4 and N_2O also contribute to global climate change, these GHGs would be emitted in much smaller quantities than CO_2 because mobile sources would be the primary source of GHG emissions associated with the proposed actions, and CH_4 and N_2O represent a negligible portion of GHGs associated with mobile sources (CCAR, 2009).

Emissions of GHGs are dispersed worldwide throughout the atmosphere, and the effects of climate change are borne globally, unlike emissions of criteria air pollutants, which have regional and/or local impacts on air quality. Using the assumptions provided in Appendix B, estimated GHG emissions for operation emissions associated with the proposed actions are provided in Tables 4-4 and 4-5.

Table 4-4: Total Annual GHG Emissions: Medical Facilities Development (All Alternatives)

Emission Source	CO_2	CH_4
Heating	1163.50	0.022
Generators (Aboveground Alternative	500.18	0.080
Commuters	204.29	N/A
Total (Aboveground Alternative	**1,867.97**	**0.102**
Generators (Underground Alternative)	583.47	0.093
Total (Underground Alternative)	**1,951.32**	**0.115**

Table 4-5: Total Annual GHG Emissions: University Expansion (Alternatives 1 and 2)

Emission Source	CO_2	CH_4
Heating	540.14	0.010
Generators	83.35	0.013
Total	**623.49**	**0.023**

Methane has a Global Warming Equivalent of 72, which means that if the same mass of methane and carbon dioxide were introduced into the atmosphere methane would trap 72 times more heat than the carbon dioxide over the next 20 years. Therefore, to complete the full analysis of CO_2e, the total amount of CH_4 (0.138 TPY for the combined alternatives) is multiplied by 72, resulting in a CO_2e of 9.936 TPY. Carbon Dioxide has a global warming potential of 1, so no additional analysis is required. Therefore, when the highest GHG-producing alternatives are combined, the expected GHG emissions would be 2,584.74 TPY CO_2e (1,959.60 TPY for Medical Facilities Development and 625.14 for University Expansion).

As a result, any combination of the proposed action alternatives would not produce a significant amount of GHG emissions. The total projected emissions are below the recommended screening level for including a quantitative and qualitative assessment of GHG emissions of 25,000 metric tons of CO_2e emissions annually.

4.4.5 Air Quality Impacts: No Action Alternative

There would be no construction or change in the emissions from NSA Bethesda under the No Action Alternative. Therefore, no impacts on air quality resources would be expected to occur from implementation of the No Action Alternative.

4.5 Noise Consequences

During construction of the proposed actions, noise would be generated by the movement of trucks required for demolition and construction, and by the on-site delivery of construction materials (mobile sources), by operations in and around construction staging areas, and by construction activity and the operation of construction equipment (stationary sources). Impacts on noise levels from the proposed actions are discussed in this section.

The subject of this noise impact analysis consists of noise-sensitive land uses where a human activity may be adversely affected when noise levels exceed predefined thresholds of acceptability. Sensitive receptors within the NSA Bethesda campus and in the surrounding area include residences, healthcare facilities, schools, houses of worship, and libraries. Outdoor receptors in the area may include parks, golf courses, and school grounds.

Although the Montgomery County Noise Ordinance is not applicable at NSA Bethesda, the EIS adopted its levels to evaluate the impacts of

construction noise at receptors located on and off the installation (the locations of receptors are described in relation to proximate noise sources later in this chapter and in Appendix C and the monitoring locations are shown in Figure 3-5). The intent of the ordinance is to control noise to protect public health and welfare and to allow the peaceful enjoyment of property. The ordinance contains maximum noise levels that differ depending on the day of the week, i.e., weekday or weekend, and the time of day. The noise ordinance also contains maximum construction noise levels and places restrictions on the time of day construction noise can reach maximum levels (see Chapter 3.5 and Table 3-9).

Potential impacts due to mobile source activity as a result of the delivery of materials for the entire project are also evaluated. It is expected that all construction trucks for the proposed actions would enter NSA Bethesda at Gate #5, travel along Perimeter Road and then disperse to the various construction sites. The trucks would exit mainly through Gate #1 on Rockville Pike. The Traffic Study conducted for the EIS determined that currently approximately 24 trucks enter Gate #5 during a peak hour. Based on the projected construction and demolition requirements for the proposed actions, the Traffic Study estimates that those actions would require seven truck trips per hour in addition to the existing trips for a total of 31 truck trips during the peak hour.

A change of 3 dB(A) in noise levels is the minimum discernible to the human ear, and traffic volumes must double to produce a 3 dB(A) increase in noise levels. To assess mobile source noise impacts related to construction traffic, expected truck traffic volumes were converted into Passenger Car Equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, and one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars. As discussed, construction-related truck activity to and from NSA Bethesda campus would not double truck traffic volumes or PCE volumes at Gate #1. Therefore, significant noise impacts from construction trucks are not anticipated. Potential mobile source noise impacts, as well as stationary source impacts, for individual project components are discussed in the following sections.

4.5.1 Noise Impacts: Medical Facilities Development

4.5.1.1 Traffic Noise Impacts - Medical Facilities Development

Medical Facilities Development would occur in areas already experiencing vehicular noise. Construction activity is not expected to double existing traffic volumes in this area and therefore, would not generate mobile source noise impacts.

Demolition and construction associated with the Medical Facilities Development would involve the use of dump trucks to remove demolition

debris and construction material deliveries using delivery vans, trucks, and in some cases, heavy-duty tractor-trailer rigs for large building elements. These trucks would enter NSA Bethesda from Jones Bridge Road at Gate #5 and travel along Perimeter Road to the respective construction sites.

Noise generated by dump trucks and delivery vehicles results from the exhaust stack, operation of the motor and transmission, and from the tires moving over the road surface. The level of noise generated is a function of the speed at which the vehicle is moving. Typical noise levels for heavy trucks are 84 to 86 dBA at 55 mph at 50 feet. As such, noise emissions from operation of these vehicles can be controlled by restricting the speed at which they move throughout NSA Bethesda. For example, lowering the speed of a heavy truck from 40 mph to 30 mph decreases the noise generated by that vehicle 3 dB, from 83 dB to 80 dB. Although noise reduction data for speeds lower than 30 mph were not quantified, it can be assumed that further reduction in truck speed would result in lower noise emissions.

Sensitive receptors potentially affected by truck noise include the off-campus residences on Hawkins Lane adjacent to the southeast corner of the NSA campus, the AFRRI facility, and inpatient and outpatient facilities.

Additional noise reduction measures would further reduce noise at sensitive receptors located along truck routes, including:

1. Source Limits and Performance Standards to meet noise level thresholds for daytime, evening, and nighttime hours at sensitive land uses (Montgomery County Standards), see Section 3.5 and Table 3-9).
2. Designate truck routes to avoid sensitive receptors where possible.
3. Establish noise monitoring stations for measuring noise prior to and during construction. Implement noise-attenuating measures if monitored noise levels exceed adopted standards.
4. Place temporary noise barriers separating trucking routes and sensitive receptors.
5. Schedule trucking operations to avoid periods when noise-sensitive activities occur.

It is anticipated that construction would occur during daylight hours, with standard hours being from 7:00 AM to 3:30 PM; however, the contractor could request permission to work outside of that timeframe provided the work would occur during daylight hours and comply with the Montgomery County Ordinance.

Construction-related trucking requirements vary according to the construction task. At times during the construction period some locations would experience increased noise levels. This increase in noise would be short-term and temporary. Heavy trucks traveling at 30 mph can be expected to generate approximately 80 dBA, and heavy trucks

traveling at or below the posted speed limits on the campus would generate less than 80 dBA. As such, noise from construction truck traffic is not expected to exceed the adopted levels and would not result in significant increases in noise levels.

4.5.1.2 Other Noise Impacts - Medical Facilities Development

General Construction Stationary Source Assessment Methodology

Stationary construction equipment to be used during the construction period was identified for each project element. To capture the reasonable worst case condition in the stationary source noise assessment, the Federal Highways Administration, Roadway Construction Noise Model (RCNM) was used to estimate sound pressure levels at sensitive receptors in the vicinity of project construction sites. Receptor buildings (the locations of receptors are described in relation to proximate noise sources later in this chapter and in Appendix C and the monitoring locations are shown in Figure 3-5) were evaluated based on the activity inside the building for both existing buildings on NSA Bethesda and expected uses in buildings that would be occupied during the construction process. The RCNM model was populated with construction equipment according to a reasonable most severe case scenario in which multiple pieces of construction equipment were in use concurrently. For a detailed description of assumptions and stationary source noise assessment methodology see Appendix C.

Table 4-6 shows that the hourly equivalent noise levels for demolition, earthwork, and construction of structures ranges from between 72 dBA and 88 dBA at 50 feet from typical construction activities, depending on the type and number of pieces of equipment. As illustrated in the sections below, some elements of the proposed actions may require noise reduction measures in order to achieve levels identified in the county noise ordinance. Potential noise reduction measures have been identified to control airborne noise impacts. Typical measures that would be considered and implemented as appropriate include:

- Source Limits and Performance Standards to meet noise level thresholds for daytime, evening, and nighttime hours at sensitive land uses (Montgomery County Standards).
- Restricting truck travel, or limiting the speed at which they travel, in areas where sensitive populations are proximate to the roadway. These areas include the off-campus residences along Hawkins Lane east of Gate 5, Palmer Road South near Building 10, and Palmer Road North near Building 19. Establishing noise monitoring stations for measuring noise near sensitive receptors or the fence line prior to and during construction.
- Design considerations and project layout approaches including measures such as construction of temporary noise barriers, placing construction equipment farther from noise-sensitive receptors, and constructing walled enclosures/sheds around especially noisy activities such as pavement breaking.

Table 4-6: Typical Construction Noise Levels

No of Items	Equipment Type	Maximum Equipment Noise Level at 15 m, (50 feet) dBA	Hourly Equivalent Noise Levels at 15 m (50 feet), dBA[1]	Hourly Equivalent Noise Levels at 30 m (100 feet), dBA[1]
Clear and Grub				
1	Excavator	81	78	72
1	Backhoe	78	75	69
4	Heavy Dump Trucks	76	73	67
		Overall L_{eq} (h)	**83**	**77**
Pavement Demolition				
1	Front Loader	79	76	70
1	Hoe Ram	90	87	81
4	Heavy Dump Trucks	76	73	67
		Overall L_{eq} (h)	**88**	**82**
Retaining walls				
1	Backhoe	78	75	69
1	Bormag BMP 851	80	77	71
1	Concrete Pump	81	78	72
1	Compressor	78	75	69
3	Ready Mix Trucks	79	76	70
4	Heavy Dump Trucks	76	73	67
2	Flatbed Truck	75	72	66
		Overall L_{eq} (h)	**86**	**80**
Paving				
1	Grader	85	82	76
1	Water Truck	76	73	67
1	Vibratory Roller	80	77	71
1	Compactor	80	77	71
1	Concrete Pump	81	78	72
3	Ready Mix Trucks	79	76	70
1	Asphalt Paver	77	74	68
1	Asphalt Roller	80	77	71
1	Sweeper	79	76	70
4	Heavy Dump Trucks	76	73	67

No of Items	Equipment Type	Maximum Equipment Noise Level at 15 m (50 feet), dBA	Hourly Equivalent Noise Levels at 15 m (50 feet), dBA[1]	Hourly Equivalent Noise Levels at 30 m (100 feet), dBA[1]
Earthwork				
1	Excavator	81	78	72
1	Backhoe	78	75	69
1	Front Loader	79	76	70
1	Dozer	82	79	73
1	Trencher	80	77	71
4	Heavy Dump Trucks	76	73	67
		Overall L_{eq} (h)	**86**	**80**
Structures				
1	Excavator	81	78	72
1	Backhoe	78	75	69
1	Compactor	80	77	71
1	Crane	81	78	72
1	Concrete Pump	81	78	72
1	Compressor	78	75	69
1	Bridge Deck Paver	77	74	68
2	Flatbed Truck	75	72	66
4	Heavy Dump Trucks	76	73	67
3	Ready Mix Trucks	79	76	70
		Overall L_{eq} (h)	**88**	**82**
Miscellaneous				
1	Front Loader	79	76	70
1	Dozer	82	79	73
2	Heavy Dump Trucks	76	73	67
		Overall L_{eq} (h)	**82**	**76**

Notes: Calculated construction noise levels assume that all equipment operates for six hours per eight hour day and that all equipment is operated at full load 70 percent of the time. Predicted noise levels are from the center of the construction activity.
Source: USDOT, 2006.

- Sequencing operations to combine especially noisy operations to occur in the same time period. Although the operation of multiple pieces of equipment would generate higher noise levels, the duration of the noisy period would be shorter.

Building C – Site Preparation (Demolition) and Construction

Demolition and construction activity associated with Medical Facilities Development could potentially affect noise levels within NSA Bethesda and adjacent areas. Sensitive receptors considered in the noise assessment for Building C include the inpatient population in Buildings 19, 9, and 9A. Due to the distances between the proposed Building C and other receptors at NSA Bethesda (Buildings 50, 60, 61, 62, 65, 66, and 67), and the structures situated between the construction site and these receptors, the effects of noise generated during construction of Building C on these receptors is not expected to be significant and are not evaluated here.

Receptors adjacent to and outside the southern wall of Building 19, and the northern walls of Buildings 9 and 9A, estimated to be located approximately 50 feet from the perimeter of the construction site, would experience noise levels presented in Table 4-7.

Table 4-7: Estimated Construction Noise Levels at Nearby Receptors-Building C

Receptor	Demolition	Excavation	Foundations & Basements	Superstructure
Buildings 19, 9 & 9A	88.1 dBA	87.1 dBA	86.0 dBA	85.7 dBA

Source: LBG, 2011c.

As shown in Table 4-7, occupants of buildings adjacent to the construction site may experience a level of noise slightly in excess of the adopted levels, which prohibits noise levels above 85 dBA between 7:00 AM and 5:00 PM on weekdays and levels above 62 dBA at other times. The levels shown in Table 4-7 are estimated levels at the outside of the building wall. Depending on the noise attenuating effects of the building walls and windows, the levels within the building would be lower. The degree to which windows reduce noise levels depends on the number of glass panes (and if multi-pane, the nature of the gas between the panes), the thickness of the glass, the material comprising the window frame, and the condition of the frame. Similarly, the noise-attenuating effect of walls depends on the nature of the material, its thickness, and condition. Typical single-glazed windows provide approximately 20 dBA of noise attenuation. Therefore, construction noise experienced inside the buildings during the peak period is expected to reach approximately 68 dBA, within the adopted thresholds for work occurring between 7:00 AM and 5:00 PM. A noise wall situated between the construction activity and the building would further mitigate noise experienced outside the construction site. It is anticipated that construction would occur during daylight hours, with standard hours being from 7:00 AM to 3:30 PM; however, the

contractor could request permission to work outside of that timeframe provided the work would occur during daylight hours and comply with the Montgomery County Noise Control Ordinance.

Where high noise levels are caused by simultaneous operation of heavy equipment, noise emanating from the construction site could be reduced by restricting concurrent use of noisy equipment. Further measures to reduce noise experienced at a given receptor include placing equipment as far as possible from that receptor.

Parking Alternatives

- *Underground Parking* – Excavation and construction techniques to be used in the underground parking garage have not been developed at this time. Appendix C describes the assumptions that were made regarding the construction scenario involved with development of the underground parking garage as well as the other parking alternatives.

  The nearest sensitive receptors to the construction area for the underground parking garage are those populations in Building 9A and 19, both situated approximately 80 feet distant. Any sensitive receptors located west of the site are at least 350 feet distant and across Rockville Pike. The Stone Ridge School is located more than 700 feet north of the construction site across largely open landscape offering little noise attenuating elements. Estimated noise levels at Building 19 and 9A, and at the Stone Ridge School are presented in Table 4-8.

Table 4-8: Estimated Construction Noise Levels at Nearby Receptors-Underground Parking

Receptor	Excavation	Construction
Buildings 19 & 9A	79.6 dBA	81.2 dBA
Stone Ridge School	62.9 dBA	64.4 dBA

Source: LBG, 2011c.

  Excavation and construction of the underground parking garage, provided work is conducted on weekdays between 7:00 AM and 5:00 PM, would not exceed adopted construction noise levels (i.e., Montgomery County Noise Control Ordinance, see Section 3.5) at the nearest sensitive receptors. Therefore, noise impacts related to construction activities in the area are not anticipated to be significant.

- *Warehouse Area* - This construction site is located approximately 190 feet southeast of private, off-installation residential units along E. Parkhill Drive, and approximately 390 feet from the Flag Housing along Van Reypen Road. The warehouse area is approximately 30 feet lower in elevation that the Flag Housing to the southwest and slightly higher in elevation than the off-installation residences. A thin line of deciduous trees lies between the off-campus residences to the northeast and the site,

and a line of evergreen trees lie between the site and the Flag Housing. Although trees and vegetative ground cover situated between the construction site and the residences would provide limited noise attenuation, the effects of these features were not considered in the RCNM runs. The warehouses that would remain in place under this alternative are not located between the receptors and the construction site, and would not mitigate construction noise at the receptors.

The RCNM was run for two stages of construction: ground preparation and foundations; and installation of prefabricated structural elements. The noise generated by the two stages was estimated for both the private residences and the Flag Housing and is presented in Table 4-9.

Table 4-9: Estimated Construction Noise Levels at Nearby Receptors - Warehouse Area

Receptor	Ground Preparation and Foundations	Installation of Pre-Fabricated Elements
Private Residences	75.2 dBA	73.8 dBA
Flag Housing	68.9 dBA	67.5 dBA

Source: LBG, 2011c.

Construction of the parking facility on weekdays between the hours of 7:00 AM and 5:00 PM in the warehouse area would not exceed construction noise levels adopted. No significant adverse impacts are anticipated.

- *H-Lot* - This construction site is located approximately 20 feet west of the Navy Lodge residential facility and approximately 100 feet south of the Fisher Houses. The CDC is located approximately 650 feet west. Additionally, off-installation residential uses are located approximately 160 feet south of the site, across Jones Bridge Road. No other sensitive receptors within NSA Bethesda are in the vicinity of the site. A thin line of deciduous trees lies between the off-installation residences to the south of the site, and between H-Lot and the CDC. Although trees and vegetative ground cover between the construction site and the receptors would provide limited noise attenuation, the effects of these features were not considered in the RCNM runs.

  The RCNM was run for two stages of construction: ground preparation and foundations; and installation of prefabricated structural elements. The noise generated by the two stages was estimated for the off-campus residences, the CDC, the Fisher Houses, and the Navy Lodge and is presented in Table 4-10.

Table 4-10: Estimated Construction Noise Levels at Nearby Receptors - H-Lot

Receptor	Ground Preparation and Foundations	Installation of Pre-Fabricated Elements
Navy Lodge	94.7 dBA	93.3 dBA
Fisher Houses	80.7 dBA	79.3 dBA
Off-Campus Residences	76.7 dBA	75.3 dBA
Child Care Center	64.5 dBA	63.1 dBA

Source: LBG, 2011c.

Construction of the parking facility at H-Lot between the weekday hours of 7:00 AM to 5:00 PM would exceed the adopted construction noise levels at the exterior wall of the Navy Lodge. A reduction of almost 10 dBA would be needed in order to achieve the adopted levels. With some combination of a construction noise wall and mitigation measures identified above, construction noise could be reduced to the adopted levels.

Taylor Road Facilities - This construction site is located approximately 120 feet from the proposed Sanctuary Hall (WWTL), with the proposed garage situated between the construction and Sanctuary Hall. A 10 dB reduction was applied to the RCNM to account for the noise-shielding effect of the parking garage. Additionally, the construction site is approximately 320 feet southeast of the residences along Van Reypen Road. The RCNM was run for two stages of construction: ground preparation and foundations; and installation of prefabricated structural elements. The noise generated by the two stages was estimated for Sanctuary Hall (WWTL) and the Flag Houses along Van Reypen Road and is presented in Table 4-11.

Table 4-11: Estimated Construction Noise Levels at Nearby Receptors - Taylor Road Facilities

Receptor	**Ground Preparation and Foundations**	**Installation of Pre-Fabricated Elements**
Sanctuary Hall	65.2 dBA	63.8 dBA
Admiral Houses	70.6 dBA	69.2 dBA

Source: LBG, 2011c.

Construction of the parking garage at the Taylor Road Facilities between the weekday hours of 7:00 AM and 5:00 is not expected to exceed the adopted construction noise levels. No significant adverse noise impacts due to construction of the facility at this site are anticipated.

Medical Facilities Internal Renovations

Internal renovations would occur inside Buildings 1, 3, 5, 9, and 10, and would not use heavy construction equipment. Power for hand tools would be supplied off existing electrical systems within the buildings

and would not require generators. Portions of the buildings that would be affected by construction activity would be vacated prior to renovation activities, and if necessary, barriers with sufficient noise-attenuating capacity would be erected to prevent construction noise from reaching patients and other occupants located in other areas of the buildings. As such, no impacts on building occupants due to construction noise are anticipated. Temporary and intermittent noise from vehicles delivering construction materials, and pickup trucks transporting workers are not expected to create significant noise impacts.

Temporary Medical Facilities

Temporary medical facilities would be constructed at the existing G-Lot parking area. These structures are intended to be temporary, and would be modular, prefabricated structures placed on the existing parking areas.

Several facilities, including the Child Care Center and a maintenance shed, maintained by the Stone Ridge School are located approximately 20 feet north of G-Lot. Also, Building 61, which consists of inpatient housing, is located approximately 50 feet east of the lot. As such, the RCNM was run at different distances from the receptors. The results of the model run are presented in Table 4-12.

Table 4-12 Estimated Construction Noise Levels at Nearby Receptors - Temporary Medical Facilities

Receptor	Noise Level
Stone Ridge School	81.2 dBA
Housing East of G-Lot	79.2 dBA

Source: LBG, 2011c.

Construction of the temporary medical facilities between the weekday hours of 7:00 AM and 5:00 PM is not expected to exceed the adopted construction noise levels. No significant adverse noise impacts due to construction of the facility at this site are anticipated.

Utilities Upgrades

Upgrades to utilities would require: demolition of three existing cooling towers and the construction of four new cooling towers; and the replacement of existing utility transmission lines and the installation of new utility transmission line throughout the campus.

Fisher House is located more than 500 feet south of the new coolers. The Fisher Houses are residential structures providing free lodging to veterans and military families receiving treatment at military medical centers. The expected construction noise during construction of the cooling towers is presented in Table 4-13.

Table 4-13: Estimated Construction Noise Levels at Nearby Receptors - Utilities Upgrades

Receptors	Demolition	Excavation & Foundations	Superstructure Construction
Fisher House	70.3 dBA	68.3 dBA	68.3 dBA
AFRRI	81.6 dBA	79.9	79.1 dBA

Source: LBG, 2011c.

Provided that construction activity in the vicinity of AFRRI occurs between the hours of 7:00 AM and 5:00 PM on weekdays, and provided that noise from equipment used concurrently does not exceed adopted levels (i.e., Montgomery County Noise Control Ordinance, see Section 3.5), construction of the new cooling towers is not expected to generate construction noise that represents a significant adverse impact. Construction occurring on weekends or after 5:00 PM on weekdays could require some combination of mitigation measures to reduce noise levels.

Upgrades to utility infrastructure throughout NSA Bethesda would also involve new trenching in some areas or exposing utility transmission lines in existing trenches in other areas. In areas where jackhammers or other loud equipment are used adjacent to sensitive receptors, it may be necessary to build a temporary noise wall between the construction site and the receptor, or otherwise attenuate excessive noise levels.

Construction for utility upgrades would not persist in any one area for long periods; rather it would move along the utility alignment. As such, construction activity that would generate noise would also move. Given the short-term nature of construction activity at any one location (1 or 2 weeks) and the implementation of noise attenuation measures when necessary, noise due to utility construction is not anticipated to represent a significant impact.

Accessibility and Appearance Improvements

Accessibility and appearance improvements would occur at various locations within the campus. Improvements include planting of evergreen shrubs and other plants, widening of sidewalks, installing new sidewalks, construction of or improvements to pedestrian pathways, and installation of a foot bridge. Construction of the proposed accessibility and appearance improvements would involve delivery of construction and landscaping materials and the use of light-duty construction equipment, such as forklifts, backhoes, and small hydro-static front end loaders. If, for example, these three machines, and other hand tools and small machines, were in use concurrently the noise level 50 feet from the work could reach 82.8 dBA, well within the adopted levels for weekday work between the hours of 7:00 AM and 5:00 PM. This work would occur throughout the campus.

Sensitive receptors that may be affected by accessibility and appearance improvement projects include populations located within the northern extend of Building 19 and Building 63, portions of the northern sections of Building 9, the southern extent of Building 61 and the western extent of Building 17. If construction work occurs less than 50 feet from these building locations and noise levels exceed adopted levels, noise mitigation measures, such as the installation of portable noise barriers or noise tents, would be implemented.

Noise generated by this activity would be short-term and temporary. Due to the limited duration of these projects, the use of light-duty construction equipment, and the implementation of noise mitigation measures (if necessary), no significant adverse impacts on ambient noise conditions are anticipated.

Building 13 Renovations

Building 13 external and internal renovations would require minimal use of heavy construction equipment. Trucks would bring materials to the site. Heavy materials delivered on pallets may be unloaded using forklifts. If breaking of pavement is required compressors and jackhammers would be in use for several days. Details of the improvements, including the scheduling of work, have not been developed. However, to consider the potential worst case scenario, the RCNM was run assuming that a jackhammer, compressor and man lift were operating concurrently on the east side of the building (closest to Building 16). In this case, noise levels at Building 16 could reach 70.6 dBA, well within the adopted thresholds for weekday work between the hours of 7:00 AM and 5:00 PM. Additionally, noisy work like breaking pavement would be temporary, occurring only during a portion of a work day and overall, a week or two.

Sensitive receptors are not located within the area affected by the renovation of Building 13. Temporary and intermittent noise from vehicles delivering construction materials and pickup trucks transporting workers are not expected to create significant noise impacts, and exterior and interior renovation work is not expected to create significant noise impacts.

Construction Material Storage

Temporary construction material storage areas provide a location to store idle construction equipment, construction materials, and provide space for construction contractors' field offices. Typical noise-generating activity occurring at these areas include delivery truck noise (delivery of construction materials by flatbed trucks or larger tractor-trailer trucks), loading or unloading construction materials (using forklift or similar), vehicle noise generated by construction worker vehicles and the movement of mobile construction equipment into and out of the area. Construction or fabrication is not anticipated at temporary storage areas.

Construction Material Storage Area 1: Temporary storage area 1 would be located at the eastern edge of the campus on land currently occupied by a sports field. Portions of USU are located approximately 500 feet to the southwest and off-campus residences are located approximately 500 feet to the south of the area. Off-campus sports fields are located approximately 275 feet to the east of the area, and swimming pools are located approximately 750 feet to the east.

Considering the activity that would occur at the temporary storage area, the RCNM was run to assess potential impacts at the residential and institutional receptors and at the swimming pools. The model indicated that noise levels could reach 57.5 dBA at USU and at the off-campus residences, and 54 dBA at the swimming pools. Operation of temporary storage area 1 would not create significant noise impacts.

Construction Material Storage Area 2: Temporary storage area 2 would be located at N-Lot situated between USU and AFRRI. Assuming a 20-foot distance would separate the building and the storage area, the RNCM indicated noise levels due to operation of the temporary storage area 2 could reach 85.5 dBA. However, because no windows are located in the walls adjacent to the area, noise levels due to operation of the storage area experienced within the building are estimated to be at least 30 dBA lower. The closest occupied portion of USU is approximately 200 feet east of the area and a one-story garage occupies land between the two. Noise attenuation due to the garage was not figured into the RCNM run. The RCNM indicates that noise levels due to operations at the storage area would reach 65.5 dBA at USU. No significant noise impacts due to operation of temporary storage area 2 are anticipated.

Construction Material Storage Area 3: Temporary storage area 3 would be located south of the helipad at the southwestern corner of the campus. Off-campus residences are located approximately 300 feet south of the area across Jones Bridge Road, and the back side of the commissary is approximately 150 feet east of the area.

Considering the activity that would occur at the temporary storage area, the RCNM was run to assess potential impacts at the residential and institutional receptors. Operation of the temporary storage area 3 could generate noise levels of approximately 62.0 dBA at the residences located south of Jones Bridge Road, and approximately 65.5 dBA at the back side of the commissary. Noise due to operation of the storage area experienced within the commissary would be at least 20 dBA lower. No significant noise impacts due to operation of the temporary storage area 3 are anticipated.

4.5.2 Noise Impacts: University Expansion

Two alternative locations for the University Expansion are considered here: Alternative 1 would place the University Expansion south of the existing University and east of Grier Road; Alternative 2 would place the University Expansion between the University and AFRRI.

Construction for both alternatives would require similar construction equipment and techniques, and the equipment and techniques would be similar to those of the Medical Facilities Development.

4.5.2.1 Traffic Noise Impacts - University Expansion

Either alternative would be constructed in areas already experiencing vehicular noise and would not experience significantly higher levels of noise due to construction traffic (Traffic volumes must double to produce a 3 dBA increase). Construction-related traffic for development of the University Expansion is anticipated to have minimal impacts on existing traffic volumes.

4.5.2.2 Other Noise Impacts - University Expansion

University Expansion - Alternative 1: Construction

The Navy Lodge is located approximately 300 feet west of the construction site and the existing University facilities are approximately 120 feet north of the construction site. Private residences south of Jones Bridge Road are located approximately 440 feet southwest of the construction site.

The RCNM was used to predict noise levels for the construction of Alternative 1 for receptors at the Navy Lodge, the existing USU facilities, and at the residences located south of Jones Bridge Road (Table 4-14). Although some portion of the wooded buffer between Alternative 1 and Jones Bridge Road would remain, the noise mitigating effects of this buffer were not considered in this construction noise analysis.

Table 4-14: Estimated Construction Noise Levels at Nearby Receptors - University Expansion Alternative 1

Receptor	Excavation and Ground Preparation	Foundations & Basements	Superstructure
Navy Lodge	72.5 dBA	70.8 dBA	70.5 dBA
University Facilities	80.5 dBA	78.8 dBA	78.4 dBA
Private Residences	69.2 dBA	67.5 dBA	67.1 dBA

Source: LBG, 2011c.

Construction of Alternative 1 is not expected to exceed the adopted construction noise levels.

University Expansion - Alternative 2: Construction

The Fisher Houses, residential structures providing free lodging to veterans and military families receiving treatment at military medical centers, are located about 320 feet southwest of the construction site and the existing USU facilities are approximately 25 feet east. AFRRI is located approximately 25 feet west of the construction site.

The RCNM was used to predict noise levels due to construction of Alternative 2 for receptors at Fisher House, the existing USU facilities, and AFRRI (Table 4-15).

Table 4-15: Estimated Construction Noise Levels at Nearby Receptors - University Expansion Alternative 2

Receptor	Excavation and Ground Preparation	Foundations & Basements	Superstructure
Fisher House	71.9 dBA	70.2 dBA	69.9 dBA
University Facilities	94.1 dBA	92.4 dBA	92.1 dBA
AFRRI	94.1 dBA	92.4 dBA	92.1 dBA

Source: LBG, 2011c.

Without noise attenuating measures, construction of Alternative 2 would exceed the adopted construction noise levels at the western wall of the University and at AFRRI. Noise attenuation across masonry walls is in the range of between 30 dB and 50 dB. However, if these walls include windows, the attenuating effect is reduced to a range of between 10 dB and 20 dB for single pane windows. Depending on the noise attenuating capacity of the walls and windows of the University and AFRRI, noise inside the buildings may also exceed identified levels. Some combination of noise attenuating measures would be required during periods when construction is occurring adjacent to these facilities.

4.5.3 Noise Impacts: No Action Alternative

4.5.3.1 Traffic and Other Noise Impacts – No Action Alternative

Implementation of the No Action Alternative would not change the noise levels at NSA Bethesda. Therefore, no impacts related to noise would be expected to occur from implementation of the No Action Alternative.

4.6 Utility/Infrastructure Consequences

4.6.1 Utility/Infrastructure Impacts: Medical Facilities Development

In general, existing utility lines are in place throughout the installation and required service capacities are either available or reasonable solutions exist to provide anticipated needs under the proposed alternatives. The proximity to and adequacy of existing utility systems are discussed in this section by utility.

No impacts on utility infrastructure are anticipated as a result of the accessibility and appearance improvement projects or the temporary construction material storage and therefore, they are not included in the discussion in Section 4.6.2.

4.6.1.1 Telecommunications

Building C – Construction and Demolition

Data, alarm, and voice communication lines run throughout the campus in an underground duct bank and manhole system. Existing Buildings 2, 4, 6, 7, and 8 are served by these systems. Demolition of these buildings would include demolition of the internal wiring that supports these systems. Building C would include new data and communication infrastructure compatible with the existing systems. Upon completion of construction of Building C, reconnection to the installation-wide data and communication systems would be made in an existing duct bank adjacent to Building 8. No impacts on the existing installation-wide telecommunication infrastructure are anticipated.

Parking Alternatives

- Underground Parking
- Warehouse Area Parking
- H-Lot Parking
- Taylor Road Facilities Parking

Data, alarm, and voice communication lines exist in the vicinity of each of the alternative parking sites. The Taylor Road Facilities parking garage is anticipated to require data and communication services for security purposes. This demand would be minor and easily supported by the existing installation-wide data and communication networks.

Medical Facilities Internal Renovations

Data, alarm, and voice communication lines currently serve Buildings 1, 3, 5, 9, and 10. Renovation of these buildings is anticipated to include updating of the telecommunications systems. All changes/upgrades would be compatible with existing systems. Connection points are anticipated to remain unchanged resulting in little or no impact on the installation-wide data and telecommunication networks.

Temporary Medical Facilities

The temporary medical facilities would require telecommunication services for day-to-day operations. Data and telecommunications infrastructure exists in the vicinity of G-Lot. The temporary medical facilities would house those functions displaced from Buildings 2, 4, 6, 7, 8. As such, the telecom demand would be consistent with current demand at the installation. Once the permanent medical facility (Building C) is constructed, demand for telecommunication services would cease at the temporary medical facilities and be restored to the new permanent facility.

Utilities Upgrades

The planned utility capacity upgrades do not include any improvements to the telecommunication systems; therefore, there would be no impacts on these systems.

Building 13 Renovations

Conversion of Building 13 from workshop/warehouse to office space would require telecommunication services for day-to-day operations. Data and telecommunications infrastructure exists in the vicinity of the building and connection to it would result in minimal impacts.

4.6.1.2 Electrical

Building C – Construction and Demolition

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C are expected to result in a net increase in load of approximately 4.6 MW. Servicing this load would require three 2,500 kilovolt ampere (kVA), 480 volt double ended substations to be constructed below grade within or immediately adjacent to the Building C footprint (NAVFAC, 2011a). The proposed electrical upgrade would support this demand.

Electric lines run through the crawl space of Buildings 2, 7, and 8. These lines would have to be relocated prior to demolition. An east/west utility corridor is envisioned between Buildings 4, 6, and 9 and a north/south corridor is envisioned between Buildings 9 and 19. Also a 12-way duct bank would be provided from Vault 243 (located between Buildings 1 and 9A) to Pad 202 (located between buildings 54 and 55) (NAVFAC, 2011p).

Parking Alternatives

- Underground Parking
- Warehouse Area Parking
- H-Lot Parking
- Taylor Road Facilities Parking

Underground power lines exist in the vicinity of each of the parking alternative sites. The parking garages would require power for lighting, pumps, and security purposes. The electrical demands for the above-ground structures would equal to or less than the underground garage and can be accommodated within the evaluation of the utilities impacts for the underground garage. This demand would be relatively minor and easily supported by the upgraded electrical system. The Navy is coordinating with PEPCO to ensure these proposed changes do not affect service delivery to the larger community by verifying that the system has capacity to accommodate the upgrades.

Medical Facilities Internal Renovations

Renovation of Buildings 1, 3, 5, 9, and 10 is not expected to result in a significant change in power demand; therefore, these renovations are not expected to have an impact on the electrical distribution system.

Temporary Medical Facilities

The temporary medical facilities would require power for day-to-day operations. An underground power line exists near the southeast corner of G-Lot, which is slated to house the temporary medical facilities. Depending on how the temporary facilities are heated or cooled, there may be an increase in demand for electricity at the temporary site. The temporary medical facilities would house those functions displaced from Buildings 2, 4, 6, 7, 8. As such, the electrical demand would be consistent with current demand at the installation. Once the permanent medical facility (Building C) is constructed, demand for power would cease at the temporary medical facilities and be restored to the new permanent facility. Temporary impacts on the installation-wide systems would include the rerouting of power to the temporary site; permanent impacts would be minimal.

Utilities Upgrades

The utility capacity upgrade projects that would have an impact on the electrical distribution system include the upgrades to the electrical distribution system.

The electrical system capacity upgrade consists of adding four new electric feeders from PEPCO's Woodmont substation to Vault 243. The new feeders would be extended from the Woodmont Substation and along Rockville Pike to NSA Bethesda property line at South Wood Road in PEPCO-built conduit and from the property line to the Vault 243 in Navy-built conduit. Addition of the new feeders would increase the capacity of the system from 31.5 MVA to 48 MVA during normal operating conditions (increased levels of power are available for finite periods of time during emergency conditions). This increase in power availability to the installation would support all currently planned projects and leave 10 MVA of excess capacity available for future growth.

Building 13 Renovations

Building 13 currently has electricity. Conversion from workshop/warehouse to administrative office space is expected to increase the building's demand; the office space would likely be heated and cooled to a greater extent than the current workshop/warehouse space. However, the renovations are expected to include increased insulation and other energy saving measures so the overall extent of the increase is expected to be small. It is anticipated that the increase can be readily supported by NSA

Bethesda's electrical distribution system once planned upgrades are complete; therefore, impacts on electricity would not be significant.

4.6.1.3 Natural Gas

Building C – Construction and Demolition

Natural gas is provided to existing Building 8. Building C, which replaces Buildings 2, 4, 6, 7, and 8, is expected to utilize natural gas for similar functions. Although Building C provides a net increase of 130,000 SF, it is not expected to have a significant increase in direct natural gas demands because the functions that utilize natural gas are not expanding. However, the increase in overall building size would result in an increase in demand for steam to heat the space, which translates into an increase in demand for natural gas at the CUP. This increase is expected to be minor due to the improved energy efficiency of the planned Building C, which would be designed at a minimum to meet LEED® Silver certification and use less energy per square foot to heat or cool compared to the five aging and inefficient buildings it would replace. The Navy is coordinating with Washington Gas to ensure that any additional demand does not affect service delivery to the larger community by verifying that the system has capacity to accommodate the increase.

Parking Alternatives

Natural gas would not be provided to the parking structure regardless of its alternative location. Therefore, there would be no increased demands on the natural gas system due to construction of the parking structure. To support development of the parking structure, natural gas lines may need to be relocated as identified below:

- *Underground Parking* – Natural gas line relocation would not be required at this site.
- *Warehouse Area Parking* – Natural gas line relocation would not be required at this site.
- *H-Lot Parking* – Depending on the final configuration of the parking structure, relocation of the natural gas line serving Building 52 may be required.
- *Taylor Road Facilities Parking* – Natural gas line relocation would not be required at this site.

Medical Facilities Internal Renovations

Natural gas is not provided to Buildings 1, 3, 5, 9, and 10; therefore, there would be no impacts on the natural gas infrastructure due to the internal renovations planned at these buildings.

Temporary Medical Facilities

Natural gas would not be provided to the temporary medical facilities; therefore, there would be no impacts on the natural gas infrastructure due to construction of the temporary medical facilities.

Utilities

The planned utility capacity upgrades do not include any improvements to the natural gas system; therefore, there would be no impacts on the natural gas infrastructure.

Building 13 Renovations

The renovated Building 13 is not anticipated to use natural gas; therefore, there would be no impacts on the natural gas infrastructure.

4.6.1.4 Potable Water

Building C – Construction and Demolition

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C are not expected to result in a significant change in potable water demand (NSAB, 2012). Although Building C is larger than the combined area of the buildings it replaces, it is not expected to have an increased demand for potable water due largely to the water conservation measures that would be incorporated into the new LEED® Silver designed building. The Navy is coordinating with WSSC to ensure these proposed changes do not affect service delivery to the larger community by verifying that sufficient water supply is available and that the existing distribution system can accommodate additional hydraulic demand at each site.

Parking Alternatives

It is anticipated that new potable water lines would need to be installed and connected to the parking structure to support a fire suppression system. There would be no increased demands on the potable water infrastructure due to construction of a parking facility. To support development of the parking structure water lines may need to be relocated as identified below:

- *Underground Parking* – Water line relocation would not be required at this site.
- *Warehouse Area Parking* – Depending on the final configuration of the parking structure, relocation of a water line may be required.
- *H-Lot Parking* – Depending on the final configuration of the parking structure, relocation of a water line may be required.

- *Taylor Road Facilities Parking* – Water line relocation would not be required at this site aside from removing water lines to buildings slated for demolition.

Medical Facilities Internal Renovations

Potable water is provided to Buildings 1, 3, 5, 9, and 10. Renovation of these buildings is not expected to have an impact on the water distribution system.

Temporary Medical Facilities

The temporary medical facilities would require potable water to operate. The temporary medical facilities would house those functions displaced from Buildings 2, 4, 6, 7, and 8. As such, water demand would be consistent with current utility demand at the installation. Once the permanent medical facility (Building C) is constructed, demand for water would cease at the temporary medical facilities and be restored to the new permanent facility. Temporary impacts on the water system would include the rerouting of water to the temporary facilities site.

Utilities Upgrades

The utility capacity upgrade projects that would have a direct impact on the potable water system include the construction of a fourth cooling tower at Building 16, replacement of damaged water distribution lines, and provision of backup water supply storage.

Addition of a fourth cooling tower at the central plant would add 13,000 gpm of chilled water capacity. Conservative estimates indicate that this cooling tower could utilize up to 50,000 gpd of potable water at peak capacity. NAVFAC is currently investigating operational changes which could considerably reduce the cooling tower demands for potable water under existing and future conditions

Replacement of water lines would result in an in-kind replacement of aging equipment and would not be expected to have significant impacts on potable water capacity or provision of service.

Backup water supply storage would consist of four 50,000-gallon underground carbon steel water storage tanks. These tanks would be located at the southwest corner of the installation near the intersection of Jones Bridge Road and Rockville Pike. This 200,000-gallon reserve of non-potable water would provide a backup water supply for the chillers and cooling towers in the case of a disruption in municipal supply. This reserve would also serve as an emergency reserve for fire protection purposes. The tank installation is not anticipated to impact facility demands. It is assumed that the supply line to the tanks would tie into the water line located southwest of the NICoE in the vicinity of the new Navy Exchange. A dedicated non-potable water line would be constructed from the tanks to the chillers

and Building 16 so this non-potable water would be isolated from the potable water.

Building 13 Renovations

Building 13's potable water use is expected to increase by as a result of the proposed renovations. These renovations would change the building's use from workshop/warehouse space to administrative space, which would increase the occupancy of the building and usage of potable water. Specific load requirements are not known as design has not progressed; however, it would be accommodated within the upgrades occurring under the proposed actions. Therefore, impacts on potable water would not be significant.

4.6.1.5 Wastewater

Building C – Construction and Demolition

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C are not expected to significantly change the demand for sewer service (NSAB, 2012). Although Building C is larger than the combined area of the buildings it replaces, it is not expected to have increased wastewater flows due to the water conservation measures planned for the new LEED® Silver designed building.

Sewer lines run through the crawl space of Buildings 2, 7, and 8. These lines would have to be relocated prior to demolition. An east/west utility corridor is envisioned between Buildings 4, 6, and 9 and a north/south corridor is envisioned between Buildings 9 and 19. The relocated sewer lines would likely run below these corridors because of their current depths (NAVFAC, 2011p). The specific relocation routes are not known at this time because detailed, site-specific project footprints have not been developed. However, these utility relocations would occur in consultation with utility service providers. The Navy is coordinating with WSSC to ensure these proposed changes do not affect service delivery to the larger community by verifying that the system can accommodate the additional load.

Parking Alternatives

- *Underground Parking*
- *Warehouse Area Parking*
- *H-Lot Parking*
- *Taylor Road Facilities Parking*

Sewer service would not be provided to the parking structure regardless of its alternative location. No relocation of sanitary sewer lines is anticipated at any of the proposed sites. Therefore, there would be no impacts on the wastewater infrastructure due to construction of the parking structure.

Medical Facilities Internal Renovations

Sewer service is provided to Buildings 1, 3, 5, 9, and 10. Renovation of these buildings is not expected to have an impact on wastewater discharge volumes or the sewer system.

Temporary Medical Facilities

The temporary medical facilities would require sewer service to operate. The temporary medical facilities would house those functions displaced from Buildings 2, 4, 6, 7, and 8. As such, demand on sewer service would be consistent with current utility demand at the installation. Once the permanent medical facility (Building C) is constructed, wastewater flows would cease at the temporary medical facilities and would be restored at the new permanent facility. Temporary impacts on the sewer system would include the rerouting of wastewater flows from the temporary facilities site.

Utilities Upgrades

The planned utility capacity upgrades do not include any improvements to the wastewater collection system; therefore, there would be no impact on the wastewater infrastructure.

Building 13 Renovations

Building 13 currently has sewer service and the demand for sewer service is expected to increase as a result of the increased occupancy of the building. Specific load requirements are not known as design has not progressed; however, it would be accommodated within the upgrades occurring under the proposed actions. Therefore, impacts on sewer service would not be significant.

4.6.1.6 Stormwater

Building C – Construction and Demolition

The existing storm drainage system serving Buildings 1 through 8 discharges into Stoney Creek south of Building 15. Storm drainage from Building C is expected to discharge to the same location. Storm drainage lines run through the crawl space of Buildings 2, 7, and 8. These lines would have to be relocated prior to demolition. An east/west utility corridor is envisioned between Buildings 4, 6, and 9 and a north/south corridor is envisioned between Buildings 9 and 19. The relocated storm lines would likely run below these corridors because of their current invert elevations (NAVFAC, 2011p). The Navy is coordinating with WSSC to ensure these proposed changes do not affect service delivery to the larger community by verifying that the system can accommodate the additional load.

Parking Alternatives

- *Underground Parking*
- *Warehouse Area Parking*
- *H-Lot Parking*
- *Taylor Road Facilities Parking*

The parking structure alternatives would require stormwater management systems and likely mitigation measures to comply with Maryland Stormwater Management Guidelines for State and Federal Projects. The Navy is coordinating with WSSC to ensure these proposed changes do not affect service delivery to the larger community by verifying that the system can accommodate the additional load.

Medical Facilities Internal Renovations

Internal building renovations would not impact stormwater management infrastructure.

Temporary Medical Facilities

The temporary medical facilities would be located on the surface of G-Lot, and the stormwater runoff systems that are already in place for the surface parking lot would accommodate those facilities; therefore, changes to stormwater runoff are not anticipated.

Utilities Upgrades

The utility upgrade projects are not expected to have an impact on the installation's stormwater drainage infrastructure.

Building 13 Renovations

The external renovations to Building 13 are not expected to change impervious areas; therefore, no changes to stormwater runoff are anticipated.

4.6.1.7 Solid Waste Management

Construction/demolition and operation of any of the components of the proposed action would generate solid waste requiring collection and disposal by the private hauler currently serving the installation. During the construction phase, solid waste in varying quantities would be generated by the building of structures, utilities, parking areas, etc. The disposal of construction-derived wastes would be the responsibility of the construction contractors involved, and is not anticipated to adversely impact solid waste collection and disposal services currently provided in the region. The construction contractor would be required to verify and document that sufficient landfill capacity exists prior to demolition.

Efforts would be made to remove scrap metal and other recyclable materials from the construction and demolition waste stream. In 2011, NSA Bethesda recycled over 5,500 tons of construction and demolition waste. Implementation of mandates such as EO 13514, which requires DoD agencies to promote pollution prevention and eliminate waste by, among other actions, diverting at least 50 percent of construction and demolition materials and debris by the end of fiscal year 2015, would reduce the solid waste sent to landfill.

The following is a brief accounting of types of waste expected to be generated by each proposed action.

Building C – Construction and Demolition

Solid waste would be generated during the demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C. If hazardous waste is encountered such as ACM or LBP from demolition of the buildings, it would be handled by the contractor according to applicable Federal and state regulations. Removal of USTs and day tanks would be handled by the contractor according to applicable Federal and state regulations.

Operation of Building C would generate solid and medical waste, which would be handled and disposed of consistent with the current SOPs at NSA Bethesda.

Parking Alternatives

- *Underground Parking*
- *Warehouse Area Parking*
- *H-Lot Parking*
- *Taylor Road Facilities Parking*

Solid waste will be generated during the construction of the parking structure. Demolition waste will be generated if the warehouse area or Taylor Road Facilities are selected. If Taylor Road Facilities is selected, remediation of AOC 2 would be required. AOC 2 covers multiple sites, including the area at Taylor Road, and overall clean-up actions are ongoing. The Taylor Road area is finished and full close-out of AOC 2 is anticipated prior to ROD signature (Pers. Comm., Sadlon, 2012d). If hazardous waste is encountered, it will be handled by the contractor according to applicable Federal and state regulations.

Medical Facilities Internal Renovations

Construction and demolition waste would be generated by the interior renovations of Buildings 1, 3, 5, 9, and 10. If hazardous wastes such as ACM and LPB are encountered, it would be handled by the contractor according to applicable Federal and state regulations.

Temporary Medical Facilities

Solid waste would be generated by the construction and operation of the temporary medical facilities. Operation would also generate solid and medical waste, which would be handled and disposed of consistent with the current SOPs at NSA Bethesda.

Utilities Upgrades

Solid waste would be generated by the demolition of the three existing cooling towers and by the construction of the other utility upgrades. If hazardous wastes such as ACM and LPB are encountered, it would be handled by the contractor according to applicable Federal and state regulations.

Building 13 Renovations

Construction and demolition waste would be generated by the external and internal renovations of Building 13. If hazardous wastes such as ACM and LPB are encountered, it would be handled by the contractor according to applicable Federal and state regulations.

4.6.1.8 Steam/Chilled Water Systems

Building C – Construction and Demolition

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C are expected to result in a net increase in heating and cooling loads. Building C is estimated to require a net increase of 10,830 pounds per hour of steam. This can be supported by the existing 8-inch steam line serving Buildings 1 through 8. Building C is also estimated to require a net increase of 1,445 gpm of chilled water and 1,095 tons of cooling capacity. Servicing this cooling load will require construction of the planned cooling tower upgrades (NAVFAC, 2011a). These upgrades and their impacts are further described below.

Steam, condensate return, and chilled water lines run through the crawl space of Buildings 2, 7, and 8. These lines would be relocated prior to demolition. Mechanical corridors are envisioned at the south and west perimeter of the basement of Building C. These corridors would house chilled water, steam, and condensate systems at a minimum (NAVFAC, 2011p).

Parking Alternatives

- *Underground Parking*
- *Warehouse Area Parking*
- *H-Lot Parking*
- *Taylor Road Facilities Parking*

Steam/chilled water would not be provided to the parking structure regardless of its alternative location. Therefore, there would be no

increase in demand to the steam/chilled water systems. Development of the parking structure is not anticipated to require relocation of steam or chilled water lines aside from those serving buildings slated for demolition.

Medical Facilities Internal Renovations

Internal building renovations are not expected to impact the steam or chilled water systems.

Temporary Medical Facilities

Steam/chilled water would not be provided to the temporary medical facilities; therefore, there would be no impacts on the steam/chilled water systems due to their construction and/or operation.

Utilities Upgrades

The utility capacity upgrades that would have an impact on the steam/chilled water systems include cooling tower upgrades and replacement of condensate return lines.

The cooling tower upgrade project consists of demolishing the existing three cooling towers located in Building 252 and rebuilding them to provide a total 39,000 gpm of capacity. These towers would be rebuilt on top of the existing concrete foundation. A fourth concrete foundation and tower would be constructed north of the existing central plant to provide an additional 13,000 gpm capacity needed to support planned expansion (NAVFAC, 2011o). The 4th tower would be constructed on an existing paved surface to match the 3 adjacent, existing towers.

The condensate return lines project replaces deteriorating condensate return lines utilized by the central steam plant system installation-wide. This includes approximately 9,255 linear feet of lines that are direct-buried, as well as approximately 1,952 linear feet within tunnels (NAVFAC, 2011e). The approximate location of the lines is shown in Figure 2-1. The existing failing condensate lines would be replaced with insulated steel piping. This upgrade would eliminate substantial leaks and increase the overall reliability of the central steam heating system.

Building 13 Renovations

Due to the change to administrative use, the renovated space would likely be heated and cooled to a greater extent than the current workshop/warehouse space. Although the exact electrical demand is not known at this time, it is fully anticipated to be accommodated within the proposed upgrades. Additionally, the renovations are expected to include increased insulation and other energy saving measures so the overall extend of the increase is expected to be small.

4.6.2 Utility/Infrastructure Impacts: University Expansion Alternatives

This section discusses utility/infrastructure impacts from the University Expansion alternatives. Impacts on utility infrastructure are from the internal renovations of USU buildings and are anticipated to be minimal; therefore, they are not included in the discussion in Section 4.6.2.

4.6.2.1 Telecommunications

University Expansion – Alternatives 1 & 2

Data, alarm, and voice communication lines run throughout the campus in an underground duct bank and manhole system. This system currently serves the University and is located near both of the alternative expansion sites. This expansion would increase the University's demand for data, alarm, and voice communication services. The building has not been designed so the specific telecom needs are unknown. However, the installation has significant available capacity because the installation-wide data and telecommunication systems have been designed for expansion. Verizon provides service to the PBX via twenty T-1 circuits. 6,000 ports are currently in use and the PBX has the capacity of 10,000 ports (NAVFAC, 2011d). There is sufficient available capacity on the data and telecommunications systems to support expansion of the University without adverse impacts on existing users.

4.6.2.2 Electrical

University Expansion – Alternatives 1 and 2

PEPCO provides an independent power feed to the University complex via two 13.2 kV feeders from PEPCO's NIH Substation 167. The two feeders terminate in metering switchgear located in USU Building 71. The USU switchgear serves both the University and the AFRRI complexes. Power to either alternative site location would originate from this switchgear. According to PEPCO, the highest recorded peak power demand on these feeders is approximately 4.22 MVA with a normal load of approximately 3 MVA. The feeders have a capacity of 12.5 MVA; therefore, there is ample available capacity to support University Expansion alternatives. However, the Navy would coordinate with PEPCO to confirm the capacity once the design work is completed and the exact utility requirements are known.

4.6.2.3 Natural Gas

University Expansion – Alternatives 1 and 2

Natural gas is not provided to the University and is not expected to be provided to the University Expansion at either alternative location; therefore, no direct impacts on the natural gas infrastructure are anticipated. However, the University expansion would be heated using steam from the CUP. An increase in demand for

steam translates into increase in demand for natural gas, the primary fuel source for the steam boilers. This increase would be minor compared to the overall gas demand for the installation. The supply of natural gas to the CUP is interruptible. Therefore, the increase in demand for natural gas associated with the University Expansion would not adversely affect other customers during peak demands because Washington Gas has the ability (and contractual right) to curtail service to the CUP if necessary to meet peak demands of other customers. In the event of a curtailment, the central plant boilers would operate utilizing fuel oil.

The Navy is coordinating with Washington Gas on the capacity. Because design work is not yet complete, the initial coordination is based on the square feet estimates for Building F and the parking garage. The Navy would confirm the capacity once the design work is completed and the exact requirements are known. The Navy is also coordinating with Washington Gas to ensure the changes do not affect service delivery to the larger community by verifying that the system can accommodate the additional load.

4.6.2.4 Potable Water

University Expansion – Alternatives 1 and 2

Potable water lines currently exist in the vicinity of both alternative University Expansion sites. Based on the building sizes for Building F and the parking garage, the expansion is expected to increase the demand for potable water by approximately 20,460 gpd (NSAB, 2012). The Navy is coordinating with WSSC on the capacity. The Navy would confirm the capacity once the design work is completed and the exact requirements are known. The Navy is also coordinating with WSSC to ensure these proposed changes do not affect service delivery to the larger community by verifying that sufficient water supply is available and that the existing distribution system can accommodate additional hydraulic demand at each site.

4.6.2.5 Wastewater

University Expansion – Alternatives 1 and 2

A WSSC sanitary sewer line currently exists adjacent to each of the alternative University Expansion sites. Based on the building sizes for Building F and the parking garage, the expansion is expected to increase the demand for sewer service by approximately 20,460 gpd (NSAB, 2012). The Navy is coordinating with WSSC on the capacity. The Navy would confirm the capacity once the design work is completed and the exact requirements are known. The Navy is also coordinating with WSSC to confirm that the line in the vicinity of the University expansion has adequate capacity.

Depending on the final configuration of the expansion at Alternative Site 2, an existing WSSC sanitary sewer line may have to be relocated.

4.6.2.6 Stormwater

University Expansion – Alternatives 1 and 2

Construction of the University Expansion at either location would require stormwater management systems and likely mitigation measures to comply with Maryland Stormwater Management Guidelines for State and Federal Projects. (See also Section 4.2.1 for additional discussion of stormwater management.) The Navy is coordinating with WSSC to ensure these proposed changes do not affect service delivery to the larger community by verifying that the system can accommodate the additional load.

4.6.2.7 Solid Waste Management

University Expansion – Alternatives 1 and 2

Solid waste would be generated by the construction and operation of the University Expansion. Operation may also generate solid and/or medical waste, which would be disposed of consistent with current SOPs at NSA Bethesda.

4.6.2.8 Steam/Chilled Water Systems

University Expansion – Alternatives 1 and 2

The CUP provides steam and chilled water to the USU. The main lines that feed the University campus extend from the CUP to the northwest corner of Building 70. Provision of steam, condensate return, and chilled water to the University Expansion would likely require tying into the lines from the CUP near where they enter Building 70. These utilities would have a greater distance to travel to serve the Alternative 1 site compared to the Alternative 2 site. The exact length of the route would be determined during design. The planned utility capacity upgrades have been designed to support the University Expansion; therefore, the central plant would have sufficient capacity to serve the expansion once the planned upgrades are complete.

4.6.3 Utility/Infrastructure Impacts: No Action Alternative

Implementation of the No Action Alternative would leave onsite utilities at their current service levels. There would be no impact on these utilities with the exception of the central steam heating system. If the condensate return line replacement project is not implemented then this would have a significant adverse impact on the central steam heating system. The existing condensate return lines would continue to fail and decrease the overall reliability of the system. If the other utility improvement projects described in this EIS are not implemented then the existing electrical, steam, and chilled water systems would not be able to support additional development/redevelopment at the installation.

4.7 Transportation and Traffic Consequences

The collection of existing condition data and analysis of existing roadways provided the baseline for evaluating the external and internal roadways serving NSA Bethesda. The next step in determining the transportation and traffic consequences of the Medical Facilities Development and University Expansion requires the development of a No Build condition with short-term planned projects in place without a proposed action (or the Build Alternatives). Once this scenario is established, this section discusses the traffic benefits and impacts of the Build Alternatives.

4.7.1 The 2018 Transportation Impacts: No Action Development

The 2018 No Build condition would provide a future roadway operation base to compare the future Build Alternatives. The creation of the 2018 No Build condition consists of determining roadway improvements, land use change, and parking facility assumptions. These assumptions directly affect the amount of traffic assigned to the external and internal roadway network. The following are the 2018 No Build condition assumption general categories:

- **External Roadway Improvements:** Roadway improvements along the key roadways serving NSA Bethesda listed in the BRAC Mobility Projects Matrix by the BRAC Implementation Committee.

- **External Transit Improvements:** Transit improvements that serve NSA Bethesda, helping to reduce the need to drive and park at the installation.

- **Background Developments:** Significant developments proposed in the vicinity of NSA Bethesda provided by the Maryland National Capital Park and Planning Commission (M-NCPPC).

- **Gate Improvements:** Intersection improvements separated from the external roadway improvement list serving NSA Bethesda Gates #3 and #4 entrances. These improvements are funded and expected to be completed by 2012. Improvements to Gates #1, #2, and #5 have been previously completed and are part of the baseline assessment.

- **Internal Roadway Improvements:** Roadway improvements along internal installation roadways expected to be completed by 2018.

- **Planned Projects:** Planned projects at NSA Bethesda expected to be completed by 2018.

- **Internal Installation Parking:** Parking facilities expected to be operational in 2018.

The next section breaks down the general categories into detailed descriptions covering all seven assumption categories.

4.7.1.1 External Roadway Improvements

MSHA has approved funding the construction of several roadway improvements around NSA Bethesda. These projects include widened approaches with additional turning lanes, removal of channelized right turning bays to provide safer bicycle and pedestrian crossings, and extension of existing turning bays to reduce incidents of blocking through traffic. The operational analysis for the No Build condition and all Build Alternatives includes these roadway improvements. Figure 4-1 shows the external project locations. Appendix D1 contains these designs. The letter on the map coincides with the numbers listed after each intersection below.

Old Georgetown Road at West Cedar Road (A):

Cedar Lane would have an additional left turn lane, shared with the through movement and an additional right turn lane. Both the exclusive right and left turn lanes are a total of 300 feet, an extension of 100 feet from the original left turn lane. The northbound Old Georgetown Road approach has a new 150-foot exclusive right-turn lane, matching the existing exclusive left turn lane. In total, two new approach lanes would be added to this intersection.

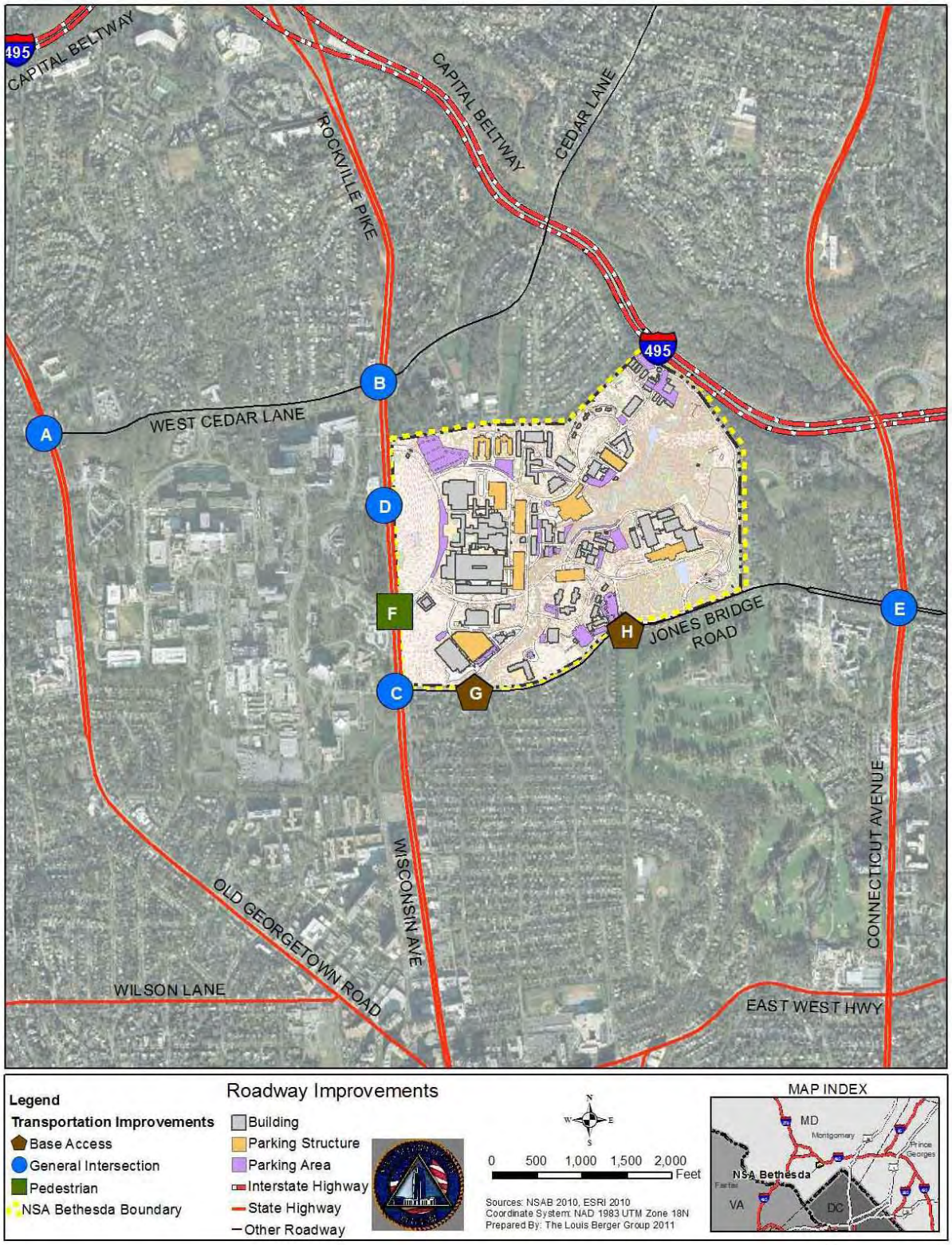
Rockville Pike at West Cedar Road (B):

The Rockville Pike northbound approach would have an exclusive new right turn lane extending back to the North Wood Road (Gate #1) intersection. The Rockville Pike southbound approach would have a new 300-foot shared right turn/through lane, with the new through lane extended to the North Drive intersection. The Cedar Road westbound approach would include a 600-foot exclusive double left turn bay, a 150-foot extension to the existing single left turning lane. In addition, the left most through lane would operate as an exclusive through lane rather than the existing shared through/left lane. The West Cedar Road eastbound approach would have a 300-foot extension to the existing right turn lane and an exclusive double left turning bay, 50-feet longer than the existing single turning lane.

Rockville Pike at Jones Bridge Road (C):

The Rockville Pike southbound approach would have a new left turn move from the existing left-most through lane to provide two lanes for turning left onto Jones Bridge Road, plus the existing left turn lane would be extended approximately 50 feet. The Jones Bridge Road westbound approach would be reconfigured to change the existing left-most through lane into a left turning lane, extending back to the Gunnell Road intersection (Gate #3). The existing right turn lane would remain 225 feet in length; however, the channelized right turn bay would be removed to provide safer bicycle and pedestrian movements at the intersection. The Center Drive approach would have a separate left turn bay, matching the 50-foot existing right turn bay. The signal would be upgraded to include the latest vehicle detector system

Figure 4-1: External Project Locations



that would continually adjust the signal timings, based upon the vehicle demand at each roadway approach.

Rockville Pike at Wilson Drive (D):

The Rockville Pike southbound approach would have a new right turn lane, extended to the North Wood Road (Gate #1) intersection.

Connecticut Avenue at Jones Bridge Road (E):

The Connecticut Avenue southbound approach would have the existing right turn lane extended past Woodlawn Road. The Jones Bridge Road eastbound approach would include an exclusive double left turning bay, and shared left turn/through movement, providing three lanes for the left turning movement. The exclusive left turning lanes would be over 250-feet longer than the existing left turning lanes and the right turning lane would be extended to the Platt Ridge Road intersection, a 600-foot extension. The Jones Bridge Road westbound approach would have an exclusive double right bay extending over 200-feet longer than the existing right-turn bay, with the far right lane also serving Kensington Parkway. This approach would also have a second exclusive through lane extending over 500-feet. The existing right through lane would extend back to Montgomery Avenue.

4.7.1.2 External Transit Improvements

Montgomery County is constructing one transit improvement project that would directly affect the development of the 2018 No Build condition. The operational analysis for the No Build condition and all Build Alternatives would include this transit improvement.

Metro Pedestrian Access/Rockville Pike Crossing Project (F):

This project would consist of two features, the construction of a new underground tunnel under Rockville Pike connecting the east side of Rockville Pike with the west side, accessed by elevators, escalators, and stairs, and the construction of elevators on the east side of Rockville Pike that would directly connect with the Medical Center Metro station mezzanine. The Rockville Pike tunnel would eliminate the need for pedestrians to cross the roadway when walking between NSA Bethesda and NIH or the Medical Center bus stop. The new elevators connecting to the Medical Center Metro station’s mezzanine would provide a direct connection between the underground Metro station and NSA Bethesda without the need to cross Rockville Pike. The current pedestrian crossing is shown in Figure 4-2, which averages 378 pedestrians an hour crossing during the AM peak period.

Figure 4-2: Pedestrian Crossing at Rockville Pike and Gate #2

4.7.1.3 Background Developments

M-NCPPC identified ten proposed developments to include in this study to account for background traffic growth along the external roadway network. This background traffic is important as it accounts for changes in traffic along the major roadways connecting to NSA Bethesda. The list of background developments, their location, and number of units or square footage can be found in Appendix D, Table 11. Figure 21 shows the locations of each proposed development.

Trip Generation

Each proposed development would generate trips through the external roadway network that services NSA Bethesda. As required by Montgomery County's LATR, trip generation rates will be derived from the LATR trip generation rates listed in LATR Appendices A and C. Appendix A contains trip generation rates for proposed developments outside of the Bethesda CBD. Appendix A also includes trip reduction equations to account for potential trips using transit. Appendix C contains special trip generation rates for proposed developments within the Bethesda CBD (M-NCPPC determined that proposed projects along Rockville Pike, south of Jones Bridge Road would fall into this category). These rates account for potential trips using transit. Both LATR Appendices A and C also include directional distribution (percentage of trips entering and exiting the proposed site) for both the AM and PM peak hour.

According to LATR policy, if a trip generation rate is not available for a specific proposed development in LATR Appendix A for proposed projects outside of the Bethesda CBD or LATR Appendix C for proposed projects within the Bethesda CBD, then the latest release of the Institute of Transportation Engineers (ITE) Trip Generation Manual should be used. Trip generation rates in the ITE Trip Generation Manual also include directional distribution, but do not account for

potential trips using transit in an area such as Bethesda. The manual provides suburban/rural peak hour trip generation rates; therefore, the rates would reflect a conservative estimate.

Both the LATR and ITE trip generation manuals either include within the trip generation rate or provide a pass-by percentage to avoid counting an existing trip (for example, a trip already accounted for in the existing conditions destined for a grocery store that would also stop at a proposed gas station).

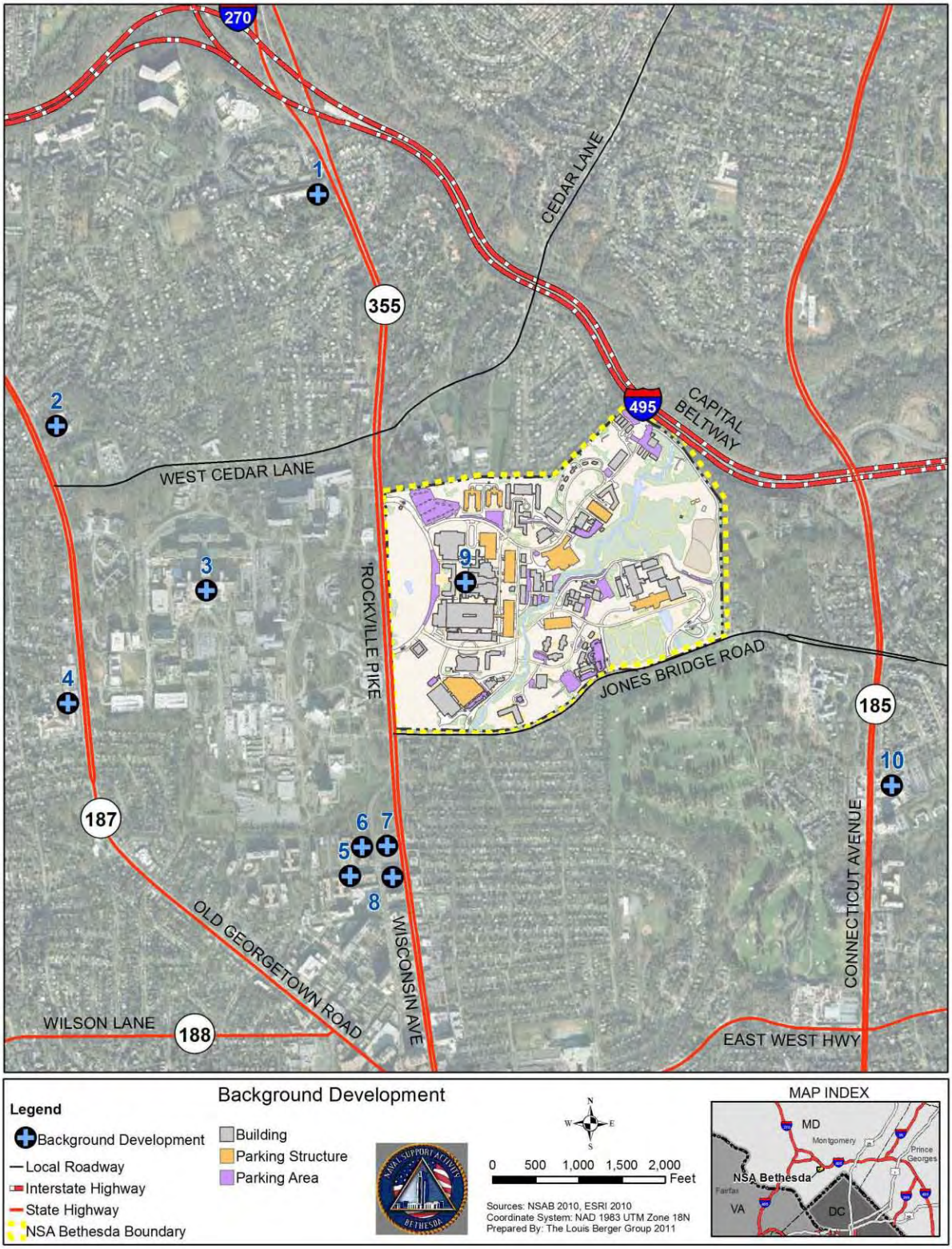
To determine the net number of trips at each proposed development site, the study calculated the number of trips generated by existing developments and subtracted that from the number of trips generated by the proposed development. For sites without any existing development, the study only calculated the number of new trips. Since the LATR provided separate trip distribution percentages for office and residential generation rates, the study separated trip generation rates for each mixed use proposed development by office, residential, and retail. By separating these three land use types, negative net trips generated sometimes occurred because a proposed new development could be smaller than the existing development. Figure 4-3 shows the locations of background developments, and Table 4-16 provides the trip generation rates for proposed development. Detailed trip generation tables for each background development are included in Appendix D2.

Table 4-16: Proposed Background Development Trip Generation Rates

	Facility Name	Type	AM Peak Hour				PM Peak Hour			
			In	Out	Pass-by	Total	In	Out	Pass-by	Total
1	FASEB Office Addition	Office	38	2	0	40	4	38	0	42
2	Alta Vista at ACC	Residential	7	22	0	29	22	12	0	34
3	NIH – Porter Neuroscience Research Lab	Office	40	0	0	40	0	36	0	36
4	Suburban Hospital	Medical	111	35	0	146	51	130	0	182
5	Glen Aldon on Battery Lane	Residential	19	72	0	91	61	30	0	91
6	Woodmont View	Office	-5	-1	0	-6	-1	-5	0	-6
		Residential	4	16	0	20	13	7	0	21
		Retail	0	2	0	2	10	5	0	15
7	8300 Wisconsin Avenue	Residential	21	84	0	105	70	35	0	105
		Retail	63	31	0	94	173	170	0	343
8	Woodmont Central - A	Office	104	18	0	122	31	91	0	122
		Retail	-18	-17	0	-35	-10	-8	0	-18
9*	Naval Support Activity Bethesda-BRAC Integration	N/A								
10	Chevy Chase Lake East	Office	103	15		118	22	105	0	127
		Retail	68	64	87	132	274	252	351	526

*This project is complete and reflected in the existing condition traffic volumes.
Facility 1 and 2 used rates provided by specific proposed development proponents.
Facility 3 used vehicle volumes provided by NIH.
Facility 5, 7, and 8 used LATR Appendix C, Bethesda CBD trip generation rates.
Facility 6 used a combination of LATR and ITE for trip generation rates.
Facility 2 and 10 used LATR Appendix A, county-wide trip generation rates.
Facility 10 used a 40 percent pass-by percentage rate provided by M-NCPPC during a phone conversation.

Figure 4-3: Location of Background Developments



Based upon the trips generated using the LATR and ITE, the proposed background developments would produce 858 trips during the AM peak hour and 1,584 trips during the PM peak hour. These proposed developments are located throughout the project study area and would add trips to Rockville Pike, Jones Bridge Road, and West Cedar Lane. The next section covers the distribution of these trips into the traffic network and discusses the impacts on study area roads. Because these are background trips, they were added to the external roadway network such as Rockville Pike, Jones Bridge Road, Old Georgetown Road, and Connecticut Avenue, but would not enter or exit NSA Bethesda.

Trip Distribution

The trip distribution for each facility is based upon area-wide percentage flows contained in LATR Appendix D and the existing roadway flows and turning movements, with the exception of the Federation of American Societies for Experimental Biology (FASEB) Office Addition and Suburban Hospital. The traffic studies for those two developments were provided by Montgomery County Planning Department/M-NCPPC and contained generation rates and distribution percentages.

The FASEB Office Addition project located on Rockville Pike near the Pooks Hill Road intersection uses the following forecasted distribution pattern for both the AM and PM peak hours: 23 percent from I-270, 21 percent from I-495 east of Rockville Pike, 19 percent from Wisconsin Avenue, 14 percent from Rockville Pike, 12 percent from I-495 west of I-270, 7 percent from Old Georgetown Road, and 4 percent from Cedar Lane.

The Suburban Hospital project located on Old Georgetown Road near the McKinley Street intersection uses the following forecasted distribution pattern for both AM and PM peak hours: 53 percent southbound and 38 percent northbound during the AM peak from Old Georgetown Road north of West Cedar Lane, 39 percent southbound and 38 percent northbound during the PM peak, 7 percent westbound and 9 percent eastbound during the both the AM and PM peak hours from West Cedar Lane.

For the retail developments, the ITE trip generation procedure for site impact analysis uses existing traffic flows along the roadway serving the site to determine which direction each trip headed when leaving or entering the site (turned left or right when entering).

For the office and residential trips, the LATR Appendix D provided the trip distribution percentages by Montgomery County superzones and from Virginia, the I-270 corridor, and Howard and Prince George’s counties. To account for the number of retail trips using the Interstate, the average of the LATR Appendix D office and residential distribution percentages were used. As a result, 60 percent of all retail trips were removed from Rockville Pike, north of Pooks Hill Road at the I-495 interchange.

The trip distribution for all background projects was developed separately and then combined to form the complete background development distribution. The background development trip distribution can be found in Appendix D, Figures 22A and 22B.

4.7.1.4 Gate Improvements

There are five gates serving NSA Bethesda; planned improvements at two are expected to be completed by 2012. The gates, #3 and #4, are along Jones Bridge Road and provide access to different parts of the installation. The operational analysis for the No Build condition and all Build Alternatives would include these gate improvements. Appendix D3 shows the designs for Gates #3 and #4. Figure 19 shows the project locations. Gates #1, #2, and #5 have recently been upgraded to include increased accessibility for vehicles, bicycles, and pedestrians.

Gate #3: Jones Bridge Road and Gunnell Road (G):

The Gunnell Road approach would be expanded to have two lanes: one exclusive right turn and a shared through and left turning lane. The gate entrance would also be expanded by one lane to have two lanes entering the installation with a new gate guardhouse constructed, but narrowing back to one lane immediately following the first intersection serving the Navy Exchange. The upgrades would include sidewalk improvements that would allow safer pedestrian access.

Gate #4: Jones Bridge Road and Grier Road (H):

The Grier Road approach to Jones Bridge Road would be expanded to have two lanes: one exclusive right turn and an exclusive left turning lane. The gate entrance would remain one lane inbound with a new gate guardhouse constructed. The upgrades would include sidewalk and bicycle lanes construction; these would allow safer access for pedestrian and bicyclists.

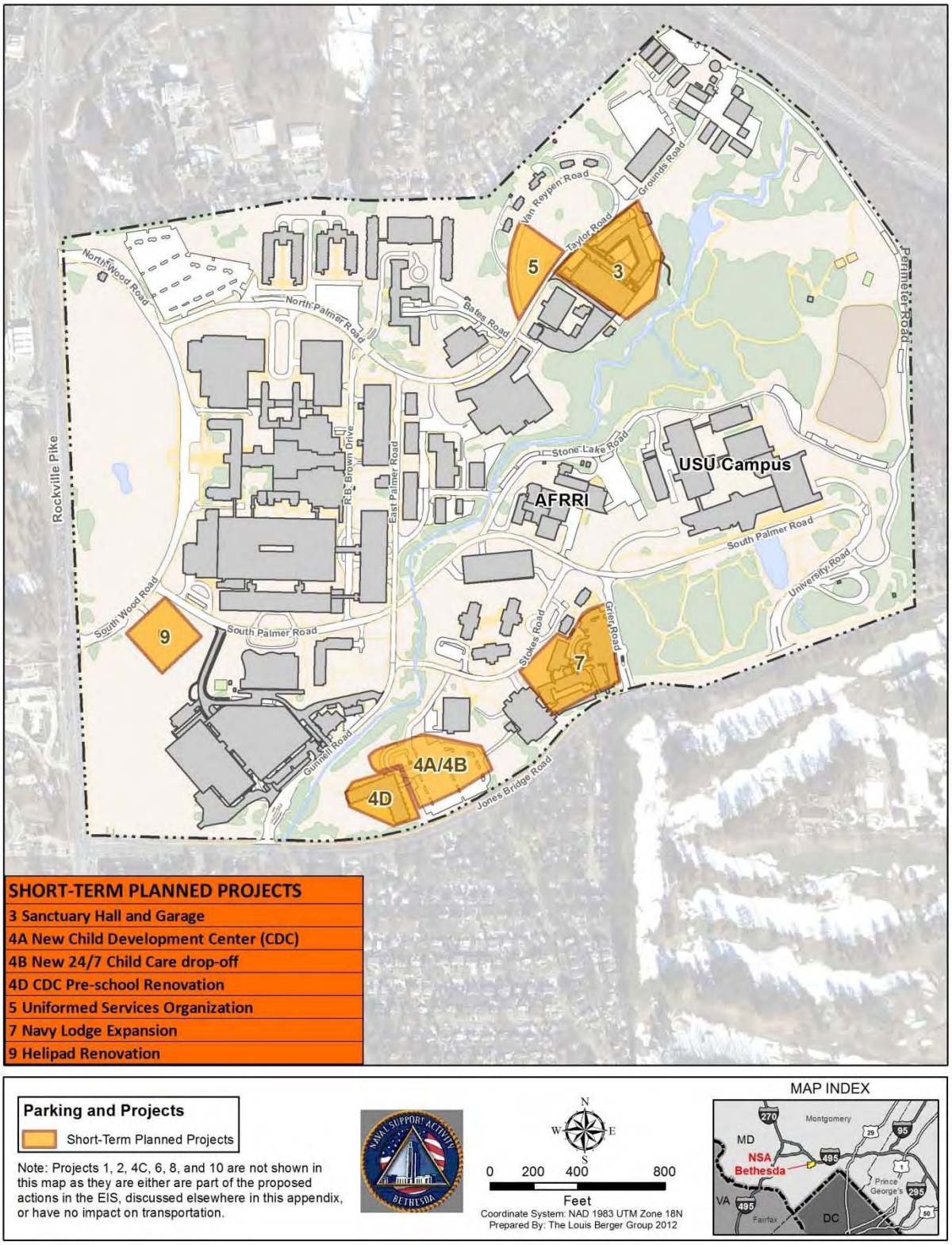
4.7.1.5 Internal Roadway Improvements

No internal roadway improvements are funded at this time; therefore, the operational analysis for the No Build condition and all Build Alternatives do not include any new internal roadway improvements.

4.7.1.6 Short-Term Planned Projects

The 2012 NSA Bethesda Master Plan identified short-term planned projects within the installation with an expected completion by 2018. Each of these planned projects would generate new trips along the internal roadway system, the gates, and the external roadway. The list of background developments, their locations, the number of new employees, and any other independent variables provided by NSA Bethesda that describes the facility expansion (number of units, square footage, or number of children) can be found in Appendix D, Table 13. Figure 4-4 shows the planned project locations.

Figure 4-4: Planned Project Locations



Note that the Navy Exchange is not a planned project as it is currently under construction. However, the study lists the Navy Exchange on the planned project list to ensure the No Build condition includes the trips created by the commercial land use.

Trip Generation

Each planned development would generate trips in and out of NSA Bethesda; however, several factors would require some adjustment. First, the installation's parking is limited both by space constraints and by the NCPC parking ratio policy. Second, the proximity of the Medical Center Metro station provides high frequency transit service and is located across the street from Gate #2.

Current installation data were used for determining the trip generation for the WWTL, Navy Lodge Expansion, and Navy Exchange at NSA Bethesda. For the remaining planned projects, the ITE trip generation rates were used to determine the total unconstrained parking rates. Those rates were then reduced by 66 percent to reflect the one space for every three employees parking ratio required at NSA Bethesda. Table 4-17 shows each proposed background development with the ITE trip generation rates and directional distributions. Appendix D2 contains the detailed trip generation tables.

Table 4-17: Proposed Background Development Trip Generation Rates

	Facility Name	**Independent Variable**	**AM Peak Hour**			**PM Peak Hour**		
			In	Out	Total	In	Out	Total
3	Sanctuary Hall (WWTL)	200 beds	25	9	34	30	28	58
4	Child Development Center (CDC)	63 staff, 326 children	164	145	309	142	160	302
5	United Service Organization (USO)	5 staff	0	0	0	1	3	4
7	Navy Lodge	64 rooms	15	9	24	20	18	38
9	Helipad	N/A	0	0	0	0	0	0
	Naval Dosimetry Center	6 Staff	1	1	2	1	1	2
	Navy Exchange	101,971 SF	0	0	0	34	34	68
	USU Growth	306 Staff	60	13	73	47	53	100
	Federal Credit Union	5 Staff	3	2	5	7	7	14

Based upon the trips generated, the planned development would produce 447 trips during the AM peak hour and 586 new trips during the PM peak hour.

The six employees from the medical facility (Naval Dosimetry Center) and 306 employees from the USU Growth projections are included in the No Build condition. They are expected to be in place by 2018 whether the Medical Facilities Development and the University Expansion are constructed or not.

4.7.1.7 Internal Installation Parking

By 2018, there would be two new parking structures added to NSA Bethesda, a new 495-space parking structure serving the retail needs of the Navy Exchange and a 470-space parking structure serving the WWTL, with approximately 326 spaces available for staff use. Two new parking lots would also be added to serve the Navy Exchange, the K-Lot and P-Lot, totaling 49 spaces. In addition, I-Lot would be reduced to 50 spaces, E-Lot would be reduced to 35 spaces, U-Lot would be increased to 95 spaces, and the lower 139-space lot in the Z-lot complex and Building 7 parking would be removed.

The resulting future 2018 NSA Bethesda parking facilities and their space distribution would differ from the existing conditions. There would be a total of 8,112 spaces, consisting of 3,584 staff spaces, 2,286 spaces for patients, 1,512 spaces for visitors, 601 spaces for barracks/lodges, and 129 government vehicle spaces. To provide ample parking for construction purposes, NSA Bethesda would be reassigning 100 staff spaces for government use resulting in 3,484 staff spaces and 229 government spaces. Table 4-18 shows the 2018 No Build condition parking facilities and space distribution. Figure 4-5 shows the 2018 No Build condition parking facility locations.

NSA Bethesda has 11,686 existing staff with 12,611 staff projected by 2018, an increase in 925 staff. Based on the comparison between the existing and No Build condition parking space inventory, there would be a net loss of 41 staff parking spaces at NSA Bethesda. There would be no parking spaces to accommodate the 655 new staff added through the planned projects. For consistency with ongoing NSA Bethesda studies, current installation data were included in the No Build condition. It is assumed that all other new staff added through the planned projects would access the installation by means other than single occupant vehicles if parking is not available. Table 4-19 contains the final No Build condition trip generation.

Table 4-18: 2018 No Build Condition Parking Facilities with Space Distribution

Surface Parking	Staff	Patient	Visitor/ Retail	Barracks/ Lodging	Gov't	Capacity
A-LOT	0	0	8			**8**
C-LOT	23					**23**
D-LOT	75	0				**75**
E-LOT	35					**35**
G-LOT	394	0			15	**409**
H-LOT	49	54	54	6	1	**164**
I-LOT			48		2	**50**
J-LOT	36		12			**48**
K-LOT (NEW)			25			**25**
L-LOT				20		**20**
M-LOT			12			**12**
N-LOT	62	0				**62**
O-LOT		15				**15**
P-LOT (NEW)	0	0	24			**24**
Q-LOT	0	0		80		**80**
S-LOT					2	**2**
T-LOT			23			**23**
U-LOT	6		89			**95**
X-LOT	19		20			**39**
Y-LOT					25	**25**
Z-LOT	24		58		11	**93**
NSAB Ball Field	0	0	60		0	**60**
Structured Parking	**Staff**	**Patient**	**Visitor/ Retail**	**Barracks/ Lodging**	**Gov't**	**Capacity**
Building 17	99	95	114	236	6	**550**
Building 32	82	626	470		24	**1,202**
Building 33 (NEW)	0		495			**495**
Building 54	749	0				**749**
Building 55	392	533			28	**953**
Building 60	0	0		51		**51**
Building 61	0	0		64		**64**
Building 63	0	924				**924**
Building 68 (NEW)	326			144		**470**
Building 71	1,117	32			2	**1,151**
Facilities Mgmt. Trans.	0	0			13	**13**
On-Street Parking						
R. B. Brown Drive	7	0				**7**
North Palmer Road	11	7				**18**
East Palmer Road	4	0				**4**
Stone Lake Road	74	0	0			**74**
Entire Campus	**3,584**	**2,286**	**1,512**	**601**	**129**	**8,112**
Construction Reassignment	**-100**				**+100**	
Entire Campus	**3,484**	**2,286**	**1,512**	**601**	**229**	**8,112**

Figure 4-5: 2018 No Build Condition Parking Facility Locations

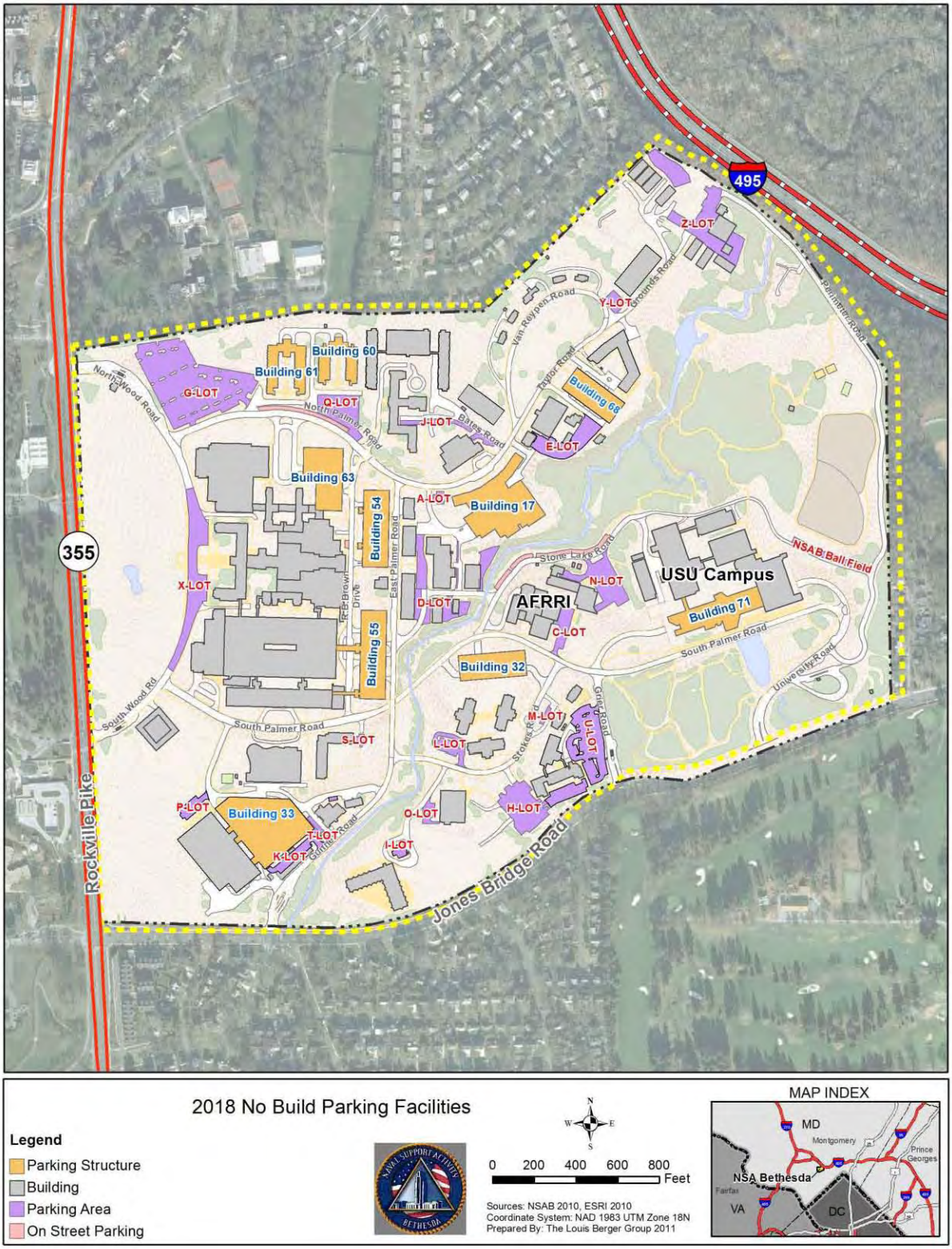


Table 4-19: Final No Build Condition Trip Generation

	Facility Name	Independent variable	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
1	Sanctuary Hall (WWTL)	200 beds	25	9	34	30	28	58
7	Navy Exchange	33,029 SF	0	0	0	34	34	68
8	Navy Lodge Expansion	64 Rooms	**15**	**9**	**24**	**20**	**18**	**38**

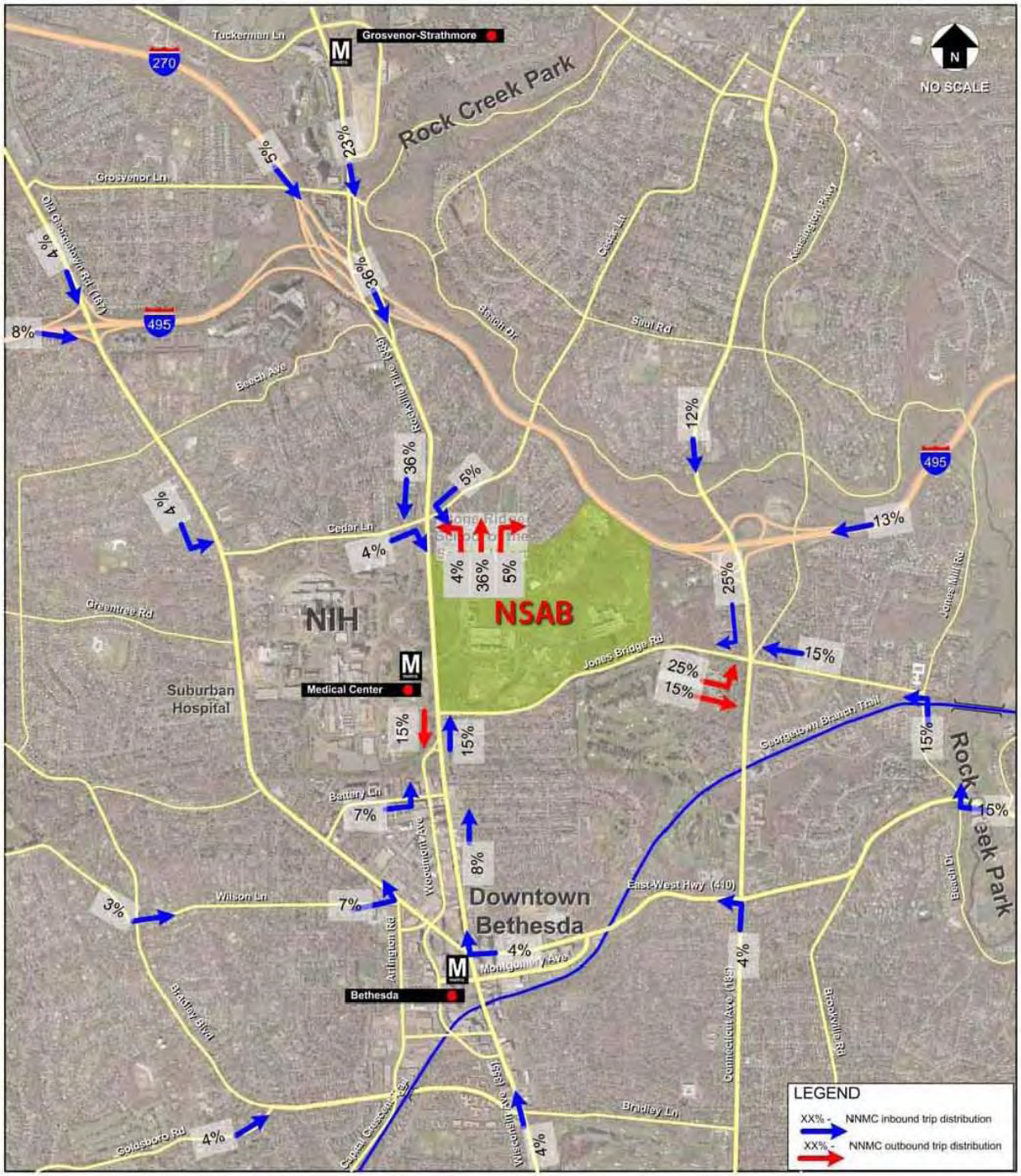
Trip Distribution

The trip distribution for the planned projects follows the same distribution percentages established in the 2008 NNMC Transportation Study in support of the BRAC EIS completed in March 2008, with one exception. The percentage of trips destined to/from West Cedar Lane was revised from 30 to 4 percent, to reflect the existing condition turning movement counts taken at Rockville Pike at West Cedar Lane. This resulted in Rockville Pike being revised from 10 to 36 percent.

Each planned project trip was assigned the shortest path through the internal NSA Bethesda roadway network between the appropriate entrance/exit gate and the parking facility expected to handle the trip, based on the updated employee distribution percentages. Once outside NSA Bethesda, trips followed the external network, following the appropriate distribution percentage through the network. The destination parking facility was based on the new or expanded facility directly serving Sanctuary Hall (WWTL) (Building 68), Navy Lodge (U-LOT), or Navy Exchange (Building 33). Figure 4-6 shows the updated distribution percentages based on the 2008 NNMC Transportation study. The Planned project trip distribution can be found in Appendix D, Figures 27A, 27B, and 27C.

In addition to the trip distribution for the planned projects, most of I-Lot and the 139-space lot in the Z-Lot complex would be closed by 2018. The closing of these lots would shift current users to other facilities within NSA Bethesda. Because the re-assignment of these spaces would be determined by NSA Bethesda and spaces potentially could be spread across multiple lots, this study did not model these movements.

Figure 4-6: Updated NSA Bethesda Distribution Percentages Based upon 2008 NNMC Transportation Study



4.7.1.8 2018 No Build Condition Trip Distribution

The 2018 No Build condition trip distribution consists of the background (external) and planned (internal) development trips added to the 2011 existing condition turning movement volumes. This combined distribution provides the data required to conduct the No Build condition operational analysis. Figures 28A, 28B, and 28C contain the 2018 No Build condition projected turning movement counts.

4.7.2 The 2018 No Build Condition Alternative Operational Analysis

The operational analysis for the 2018 No Build condition provides a base condition, which would be compared to each Build Alternative. The analysis consists of an external intersection, external arterial, and internal intersection analysis based on the traffic flows developed in the trip distribution section.

Following the same procedure used for the existing conditions operational analysis (Section 3.7.1.2), the CLV procedure was used to determine the intersection CLV LOS for all external signalized intersections. As a secondary means of analyzing the external intersections, the traffic study used the HCM, which provides the vehicle delay and vehicle density. Based on the vehicle delay, the HCM LOS is calculated. As the CLV method is not the most accurate analysis method when applied to unsignalized intersections, the HCM was used as a primary means of analyzing intersections for all external unsignalized intersections and all internal intersections, which are all unsignalized.

4.7.2.1 External Intersection Analysis

Following the same process as the existing conditions analysis for the external intersections, the 17 external intersections, including nine along Rockville Pike, six along Jones Bridge Road, and two along West Cedar Lane were analyzed.

The 2018 No Build condition includes all projects listed in the external roadway improvements (including the gate improvements) and the transit improvement, representing the future network. The 2018 No Build condition lane geometry and traffic control can be found in Appendix D, Figures 4-7, 4-8, and 4-9.

Figure 4-7: 2018 No Build Condition Projected Turning Movement Counts

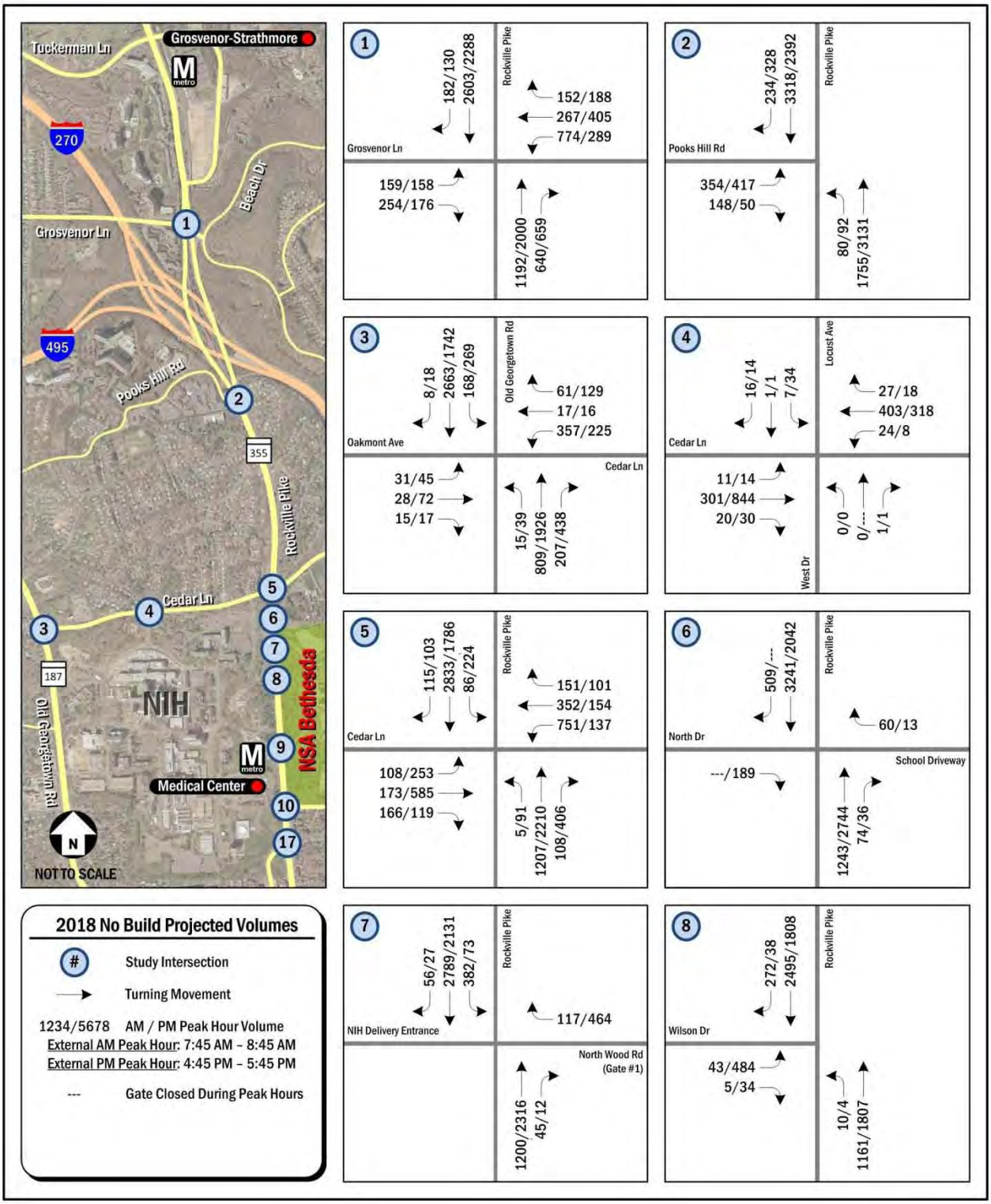


Figure 4-8: 2018 No Build Condition Projected Turning Movement Counts

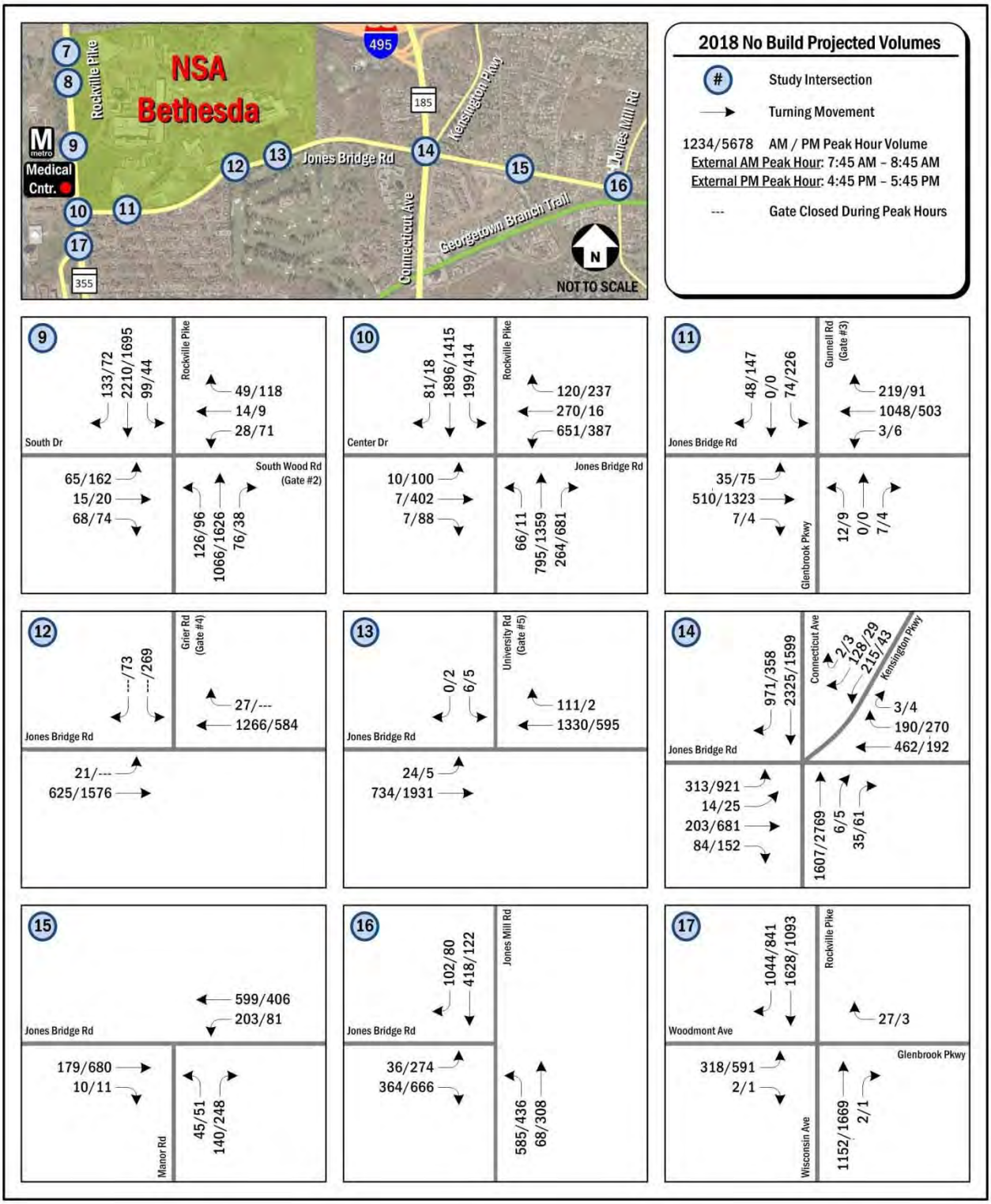
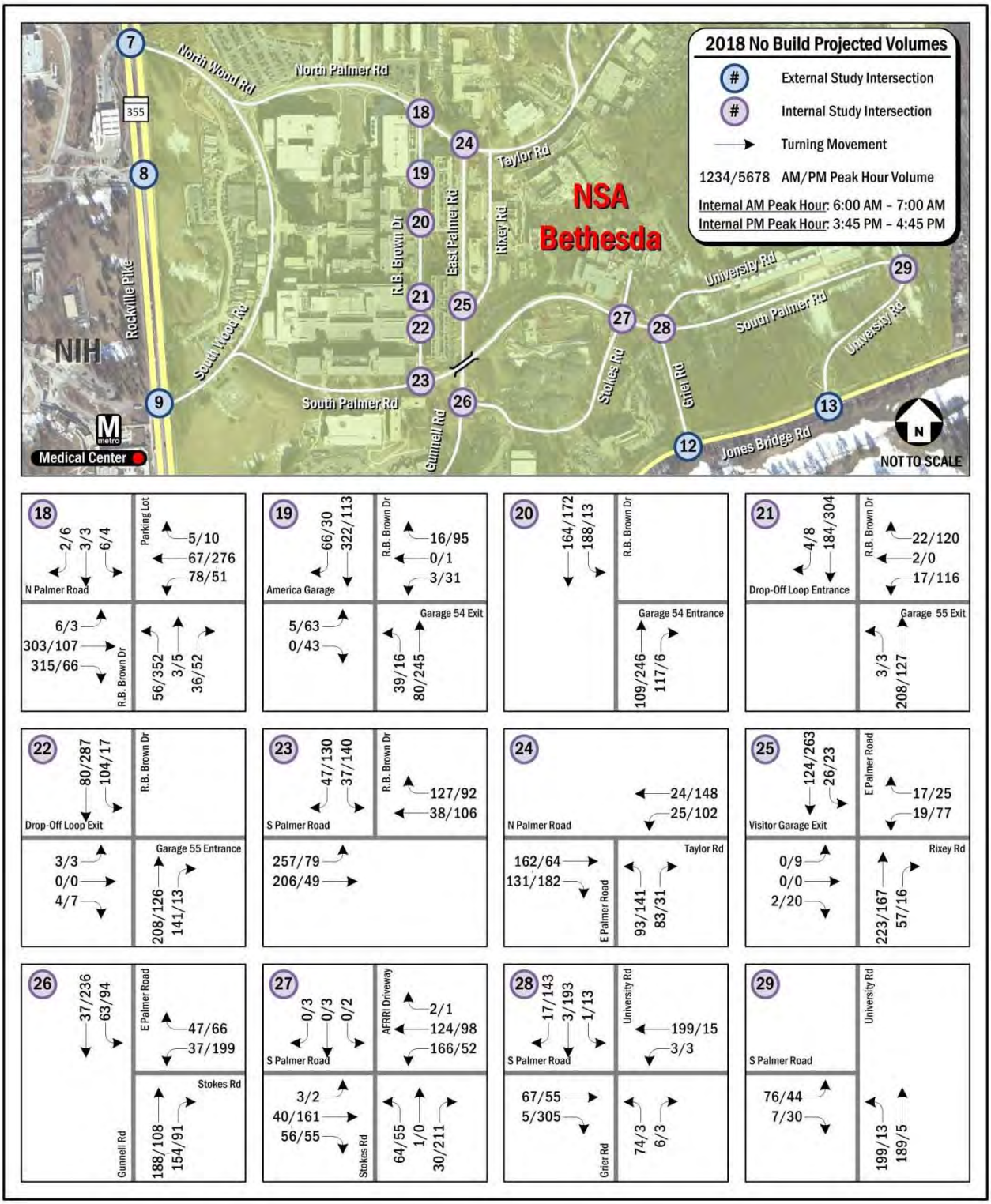


Figure 4-9: 2018 No Build Condition Projected Turning Movement Counts



Critical Lane Volume Analysis

As required by M-NCPPC's LATR and MSHA, the CLV analysis was conducted for the No Build condition, which is based on calculating the total conflicting traffic volume to determine the CLV LOS (letter grade A through F). The analysis identified two intersections that would operate at a LOS of E or F, failing grades. Specifically, during the AM peak hour, #5 Rockville Pike at West Cedar Lane and #14 Connecticut Avenue at Jones Bridge Road would both operate at a LOS of E. During the PM peak hour, #3 Old Georgetown Road at West Cedar Lane would operate at a LOS of E and #14 Connecticut Avenue at Jones Bridge Road would operate at a LOS of F. The remaining intersections would operate at a LOS of D or better for the 2018 No Build condition. Table 4-20 shows the 2018 No Build condition CLV analysis for the external intersection. Figures 4-10 and 4-11 show the 2018 No Build condition CLV intersection LOS.

Table 4-20: 2018 No Build Condition CLV Analysis for the External Intersections

		CLV Analysis			
		AM Peak Hour		*PM Peak Hour*	
		CLV	LOS	CLV	LOS
1.	Rockville Pike & Grosvenor Lane	1,373	D	1,336	D
2.	Rockville Pike & Pooks Hill Road	1,343	D	1,379	D
3.	Old Georgetown Road & Oakmont Avenue/Cedar Lane	1,437	D	1,536	E
4.	Locust Avenue/West Drive & Cedar Lane	489	A	939	A
5.	Rockville Pike & Cedar Lane	1,529	E	1,236	C
6.	Rockville Pike & North Drive/School Driveway	*un-signalized*		*un-signalized*	
7.	Rockville Pike & NIH Delivery Entrance/North Wood Road (Gate #1)	843	A	1,033	B
8.	Rockville Pike & Wilson Drive	958	A	948	A
9.	Rockville Pike & South Drive/South Wood Road (Gate #2)	1,121	B	1,039	B
10.	Rockville Pike & Center Drive/Jones Bridge Road	715	A	808	A
11.	Gunnell Road (Gate #3)/Glenbrook Pkwy & Jones Bridge Road	801	A	1,024	B
12.	Grier Road (Gate #4) & Jones Bridge Road	692	A	1,104	B
13.	University Road (Gate #5) & Jones Bridge Road	729	A	1,023	B
14.	Connecticut Avenue & Jones Bridge Road & Kensington Parkway	1,490	E	1,735	F
15.	Manor Road & Jones Bridge Road	739	A	1,009	B
16.	Jones Bridge Road & Jones Mill Road	1,039	B	1,062	B
17.	Rockville Pike/Wisconsin Avenue & Woodmont Avenue/Glenbrook Parkway	771	A	938	A

Figure 4-10: 2018 AM Peak Hour No Build Condition CLV Intersection LOS

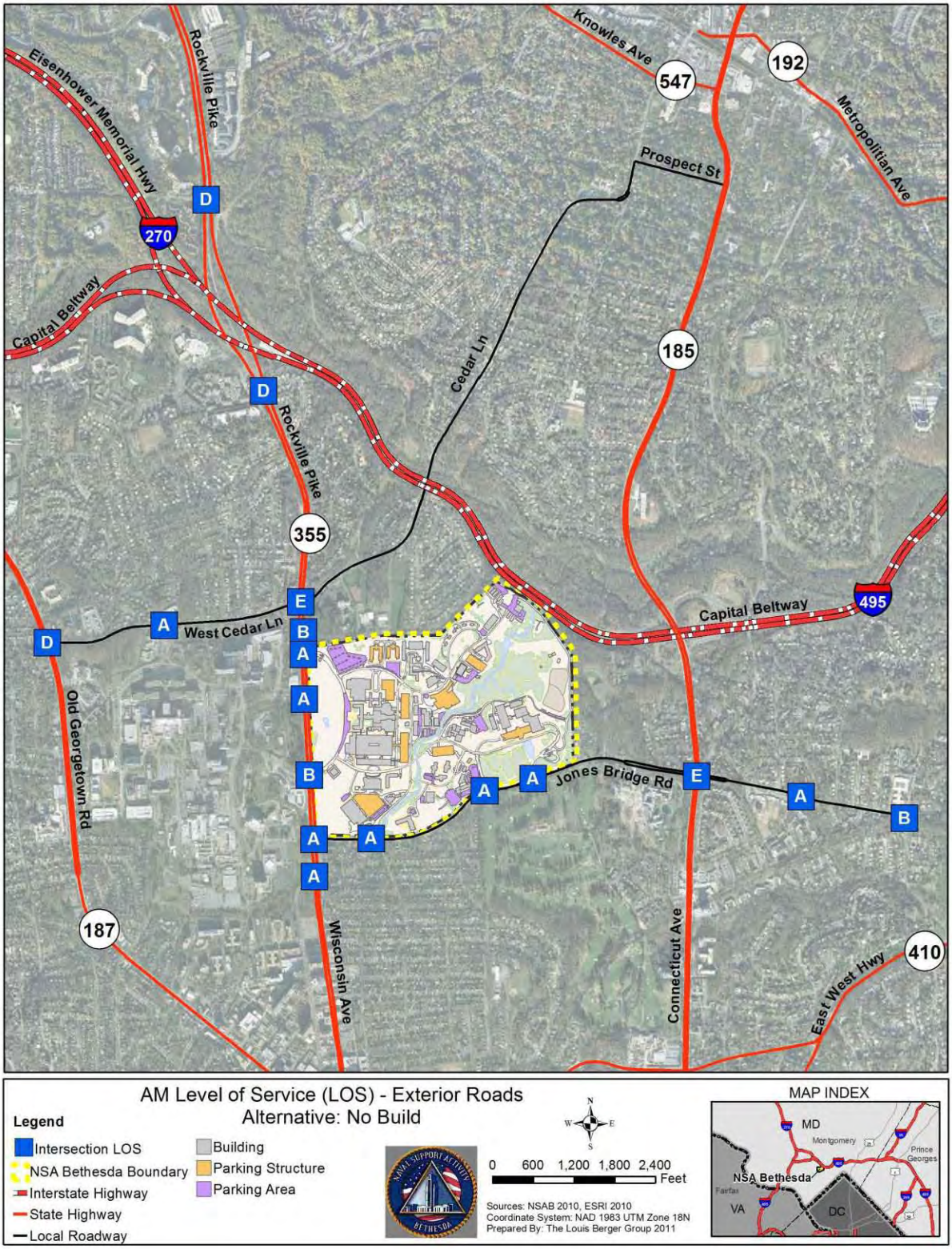
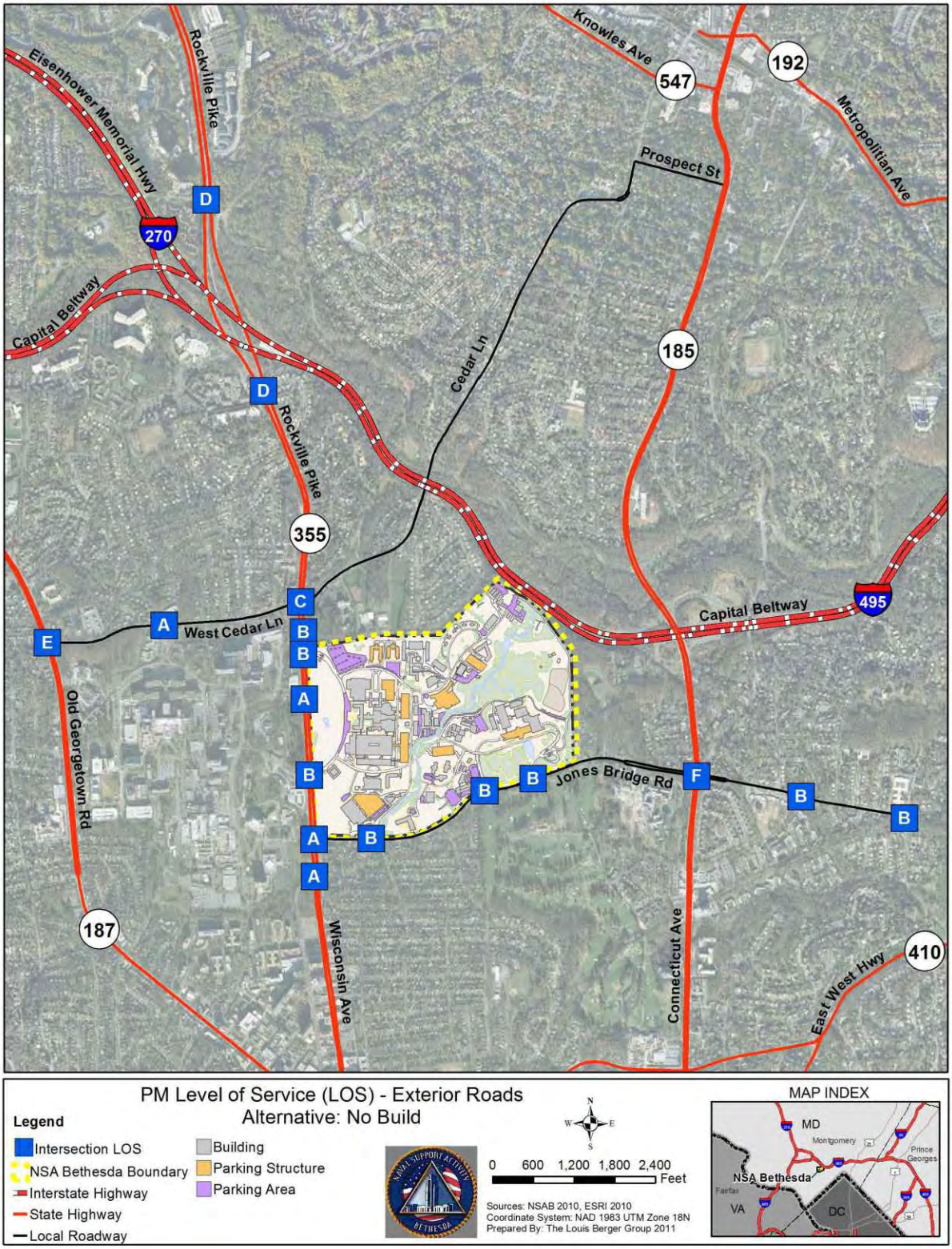


Figure 4-11: 2018 PM Peak Hour No Build Condition CLV Intersection LOS



Highway Capacity Manual Intersection Analysis

The HCM was used to provide a secondary analysis using the Synchro Traffic Analysis software to determine the intersection operation. For each intersection movement and entire approach, the delay was calculated using vehicles per second and vehicle density was calculated using the volume to capacity. Also calculated was the HCM LOS for each movement, the entire approach, and overall intersection.

The delay would provide the number of seconds for each vehicle to travel through each study intersection. The density would provide a measure of the ratio between the number of vehicles per hour and the capacity; while, the LOS provides an overall operational rating (A through F) for each approach and intersection, based on vehicle delay.

The complete HCM analysis can be found in Appendix D, Table 19. Since the CLV process was not used to evaluate unsignalized intersections, HCM analysis was used as a primary analysis tool for intersection #6 Rockville Pike at North Drive/School Driveway, which had a LOS of B during both peak periods.

Arterial Analysis

As required by M-NCPPC's Policy Area Mobility Review, the No Build condition and Build Alternatives must be compared using arterial analysis to determine if the Build Alternative's travel time is 30 percent greater than the No Build condition travel time for the main travel corridors. To satisfy this requirement, the traffic study conducted an arterial analysis along the three main corridors covered in the study area: Rockville Pike, Jones Bridge Road, and West Cedar Lane. The study calculated the arterial speed, travel times, and LOS following the HCM arterial analysis process. The arterial LOS is a grade from A through F, based upon the total travel time between Grosvenor Lane and Woodmont Avenue along Rockville Pike, between Rockville Pike and Jones Mill Road along Jones Bridge Road, and between Old Georgetown Road and Rockville Pike along West Cedar Lane.

The travel times were longer and speeds slower when traveling in the northbound direction during the AM peak hour along Rockville Pike, reflecting the signals timed to keep the southbound traffic moving. Jones Bridge Road travel times and speeds would be faster during the AM peak hour, while West Cedar Lane would have slower speeds and longer travel times in the eastbound direction during the PM peak hour. Tables 4-21 and 4-22 show the 2018 No Build condition AM and PM peak hour arterial analyses.

Table 4-21: 2018 No Build Condition AM Peak Hour Arterial Analysis

AM Peak Hour				
Arterial	**Direction**	**Speed**	**Time**	**LOS**
Rockville Pike	Northbound	11.5	11:25	E
	Southbound	21.1	6:22	C
Jones Bridge Road	Eastbound	20.7	4:59	C
	Westbound	17.1	6:01	D
West Cedar Lane	Eastbound	15.4	2:49	D
	Westbound	16.9	2:34	D

Table 4-22: 2018 No Build Condition PM Peak Hour Arterial Analysis

PM Peak Hour				
Arterial	**Direction**	**Speed**	**Time**	**LOS**
Rockville Pike	Northbound	16.0	8:11	D
	Southbound	17.7	7:36	D
Jones Bridge Road	Eastbound	17.1	6:02	D
	Westbound	16.7	6:12	D
West Cedar Lane	Eastbound	12.8	3:23	E
	Westbound	17.4	2:30	D

4.7.2.2 Internal Intersection Analysis

The internal intersection analysis follows the same process as the HCM analysis performed for the external conditions, focusing on the internal 12 intersections. According to the HCM analysis, all intersections would operate at a LOS of C or better. As was the case for the existing conditions (see Section 3.7.2.9), the #19 R.B. Brown Drive intersection with Building 63 (America Garage) has a very high pedestrian volume, resulting in the HCM reporting a LOS of F. This operation does not reflect the actual intersection operation, which would be more in line with the AM peak hour operating at a LOS of C or better. Table 4-23 shows the 2018 No Build condition internal intersection analysis and Figures 4-12 and 4-13 show the 2018 internal intersection LOS.

Table 4-23: 2018 No Build Condition Internal Intersection Analysis

	Approach	AM Peak Hour Approach Delay (s/veh)	AM Peak Hour LOS	PM Peak Hour Approach Delay (s/veh)	PM Peak Hour LOS
18. Parking Lot/R.B. Brown Drive & North Palmer Road	Overall	10.3	B	16.5	C
	Eastbound	10.9	B	9.7	A
	Westbound	8.7	A	15.6	C
	Northbound	9.0	A	20.5	C
	Southbound	9.6	A	10.0	B
19. R.B. Brown Drive & America Garage/Garage 54 Exit	Eastbound	17.6	C	*	F
	Westbound	12.8	B	*	F
	NB left	3.1	A	0.6	A
20. R.B. Brown Drive & Garage 54 Entrance	Overall	10.5	B	8.8	A
	Northbound	9.2	A	9.0	A
	Southbound	11.5	B	8.5	A
21. R.B. Brown Drive & Drop-Off Loop Entrance/Garage 55 Exit	Overall	9.1	A	11.3	B
	Westbound	8.1	A	10.9	B
	Northbound	9.4	A	9.5	A
	Southbound	8.8	A	12.3	B
22. R.B. Brown Drive & Drop-Off Loop Exit/Garage 55 Entrance	Overall	9.7	A	9.4	A
	Eastbound	8.1	A	7.8	A
	Northbound	10.1	B	8.3	A
	Southbound	9.0	A	10.0	B
23. R.B. Brown Drive & South Palmer Road	Overall	9.8	A	10.6	B
	Eastbound	10.3	B	8.9	A
	Westbound	8.7	A	10.7	B
	Southbound	9.1	A	11.4	B
24. East Palmer Road & North Palmer Road/Taylor Road	Overall	9.6	A	10.7	B
	Eastbound	10.0	A	10.0	B
	Westbound	8.6	A	11.4	B
	Northbound	9.5	A	10.7	B
25. East Palmer Road & Visitor Garage Exit/Rixey Road	Overall	9.0	A	10.2	B
	Eastbound	7.5	A	8.4	A
	Westbound	8.1	A	9.8	A
	Northbound	9.4	A	9.7	A
	Southbound	8.7	A	11.0	B
26. East Palmer Road/Gunnell Road & Stokes Road	Overall	9.5	A	15.0	B
	Westbound	8.6	A	16.0	C
	Northbound	10.1	B	11.5	B
	Southbound	8.9	A	16.2	C
27. AFRRI Driveway/Stokes Road & South Palmer Road	Overall	9.5	A	10.7	B
	Eastbound	8.1	A	10.3	B
	Westbound	10.4	B	11.0	B
	Northbound	8.9	A	10.8	B
	Southbound	0.0	A	8.6	A
28. University Road/Grier Road & South Palmer Road	Overall	8.7	A	12.5	B
	Eastbound	8.4	A	13.7	B
	Westbound	9.1	A	9.2	A
	Northbound	9.0	A	8.9	A
	Southbound	6.9	A	11.9	B
29. University Road & South Palmer Road	Westbound	8.0	A	7.1	A
	Northbound	7.9	A	7.1	A

* HCM unsignalized intersection capacity analysis result in abnormally high levels of delay at intersections with large pedestrian volumes. This intersection would perform with a similar LOS as the AM conditions, LOS C.

Note: Intersections with only two-way stops have no overall LOS identified.

Figure 4-12: 2018 AM Peak Hour No Build Condition HCM Intersection LOS

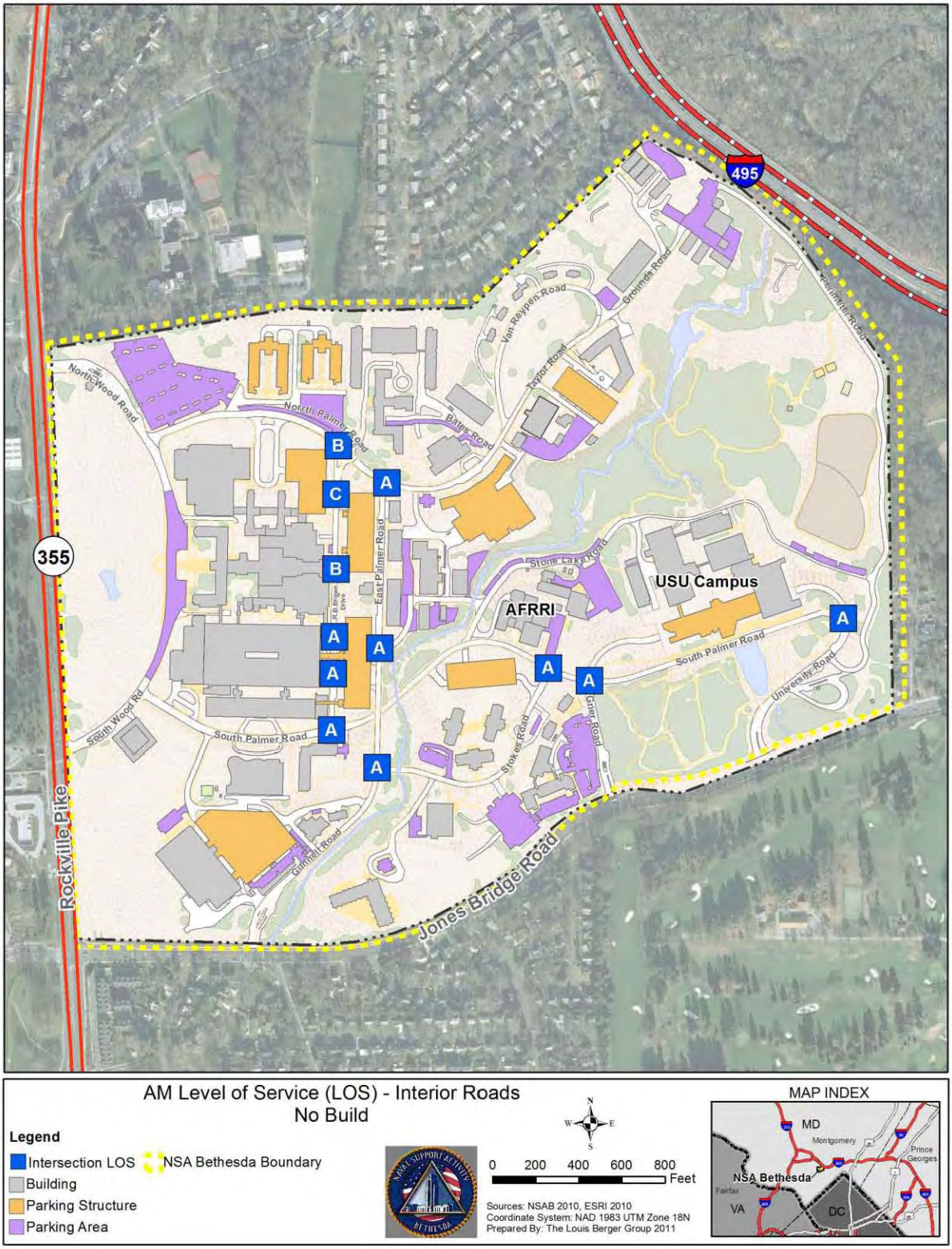
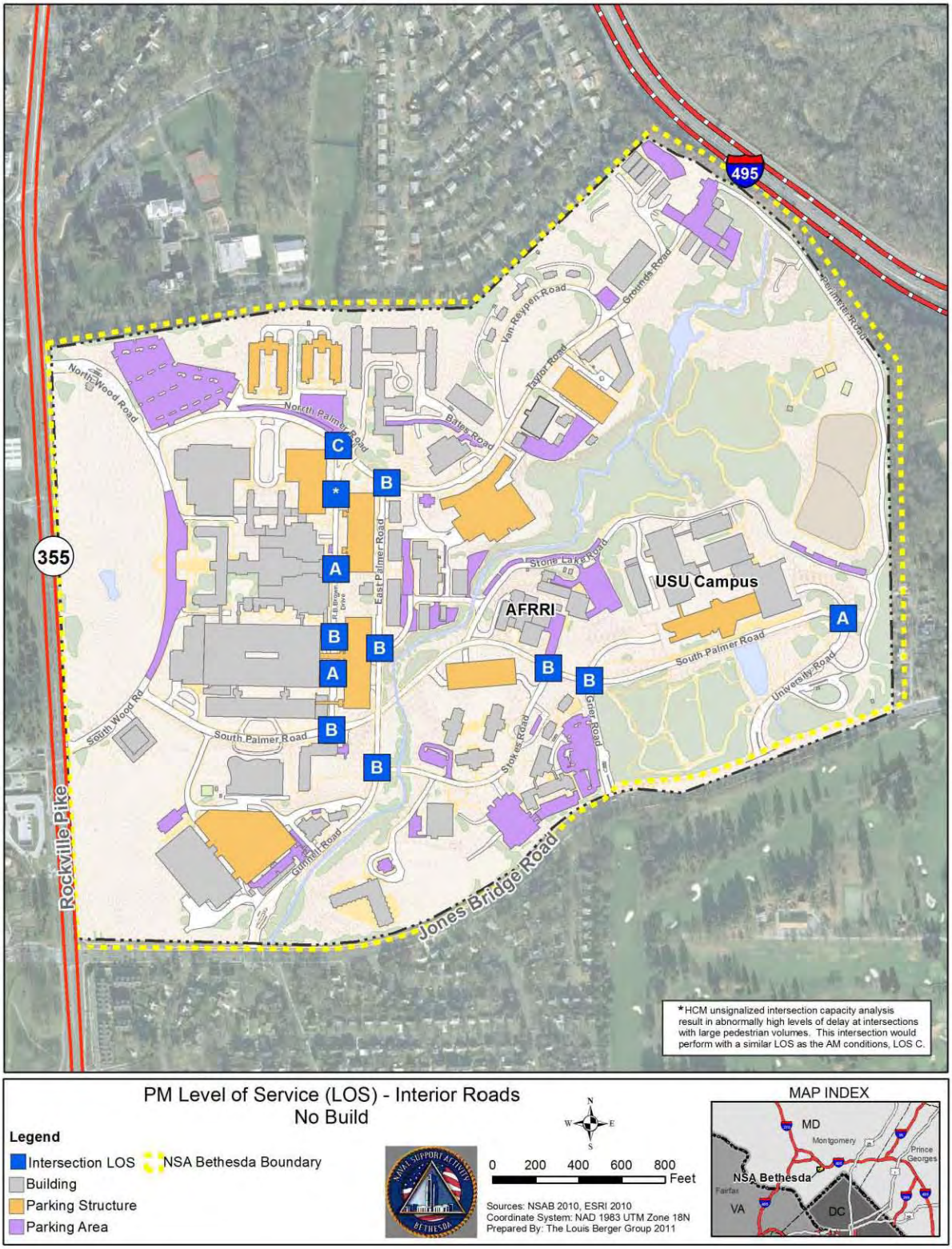


Figure 4-13: 2018 PM Peak Hour No Build Condition HCM Intersection LOS



4.7.3 2018 Transportation Impacts: Action Introduction

The 2018 transportation impacts, action (Build Alternatives) would be developed based on new parking facilities to serve the Medical Facilities Development (Building C) and the University Expansion (Building F). Table 4-24 lists the proposed parking facilities and the building complexes served. Figure 4-14 shows the locations of the proposed parking facilities.

Table 4-24: Proposed Parking Facilities

Option Letter	Parking Facility	Building Complex Served
A	New underground parking garage with its entrance located at the North Palmer Road intersection with North Wood Road and exit located at the South Palmer Road intersection with South Wood Road	Medical facility
B	New underground parking garage with its entrance and exit located at North Palmer Road (G-Lot)	Medical facility
C	New parking garage in the industrial/warehouse area accessed from Grounds Road	Medical facility
D	New parking garage accessed from Stokes Road (H-Lot)	Medical facility
E	New parking garage accessed from Taylor Road adjacent to the proposed Wounded Warrior Transition Lodge	Medical facility
F	New parking garage accessed from Stone Lake Road (USU Alternative 2)	USU
G	New parking facility along South Palmer Road between Gates 4 and 5 (USU Alternative 1)	USU

The traffic study Build Alternatives will be a combination of one medical facility parking option and one USU parking facility alternative option. Since there are five medical facility proposed parking options and two USU parking options, the total number of alternatives will be ten (5 Medical X 2 USU). Table 4-25 lists the ten 2018 traffic study Build Alternatives and the 2018 No Build condition.

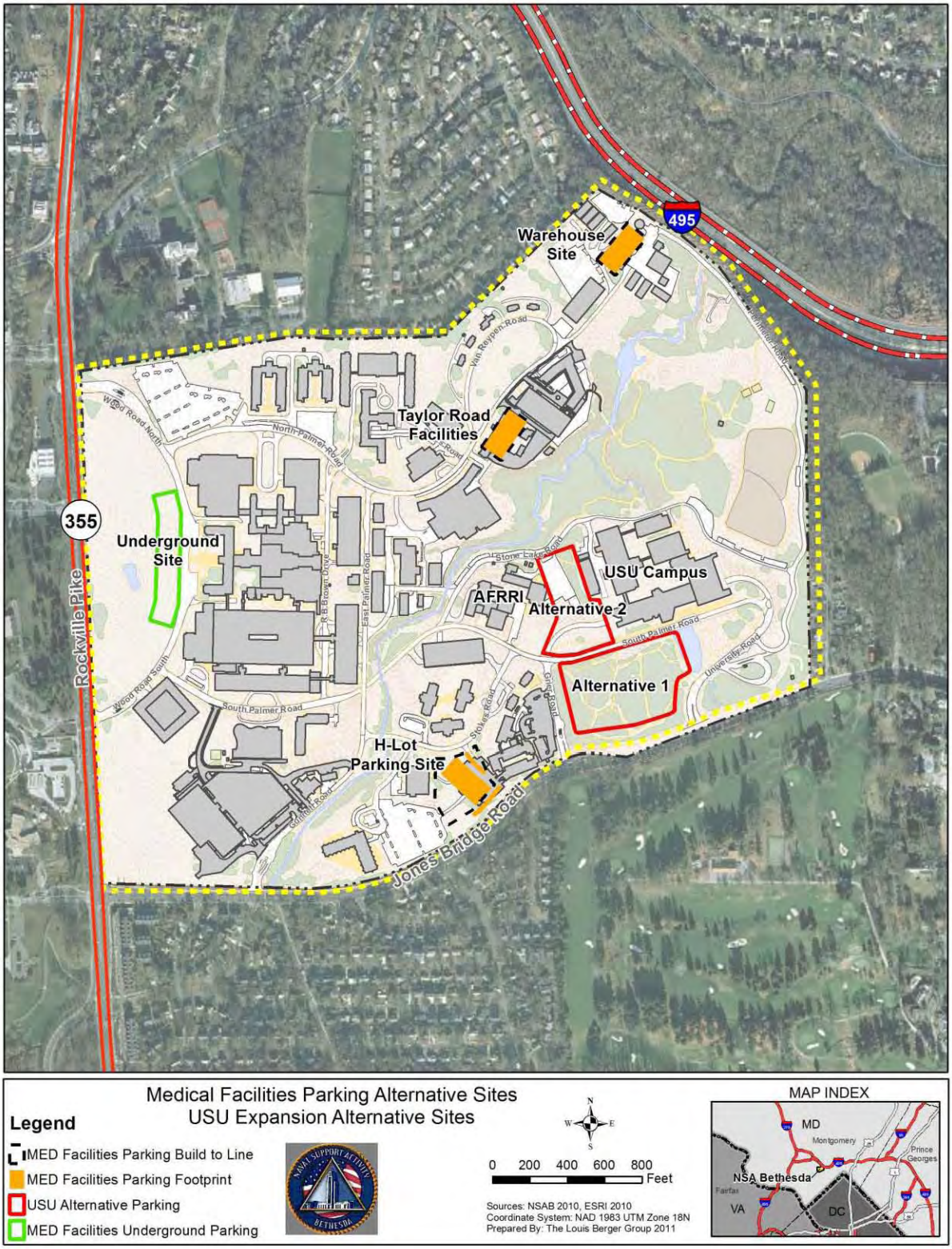
Each Build Alternative will be analyzed based on the new vehicle trips added to the roadway system and the shifted trips already represented in the No Build condition turning movement counts. The new vehicle trips would be based on the 270 new employees expected at NSA Bethesda by 2018; however, if the capacity of the new parking facility would not accommodate all 270 employees (maximum trip generation), the trip generation was reduced to equal the new parking facility capacity.

The shifted trips represent new trips added to the roadway system connecting to a new parking facility and existing trips subtracted from the roadway system connecting to the existing parking facility.

Table 4-25: List of 2018 Traffic Study Build Alternatives

Alternative	Combination of Proposed Parking Facilities from Table A
No Build Condition	Use of parking facilities expected to be in place based upon the addition of eight internal installation facilities (not including Buildings C or F)
1	Option A: new underground parking garage with its entrance located at the North Palmer Road intersection with North Wood Road and exit located at the South Palmer Road intersection with South Wood Road Option F: new parking garage accessed from Stone Lake Road (USU Alternative 2)
2	Option B: new underground parking garage with its entrance and exit located along North Palmer Road (G-Lot) Option F: new parking garage accessed from Stone Lake Road (USU Alternative 2)
3	Option C: new parking garage in the industrial/warehouse area accessed from Grounds Road Option F: new parking garage accessed from Stone Lake Road (USU Alternative 2)
4	Option D: new parking garage accessed from Stokes Road (H-Lot) Option F: new parking garage accessed from Stone Lake Road (USU Alternative 2)
5	Option E: new parking garage accessed from Taylor Road adjacent to the proposed Wounded Warrior Barracks Option F: new parking garage accessed from Stone Lake Road (USU Alternative 2)
6	Option A: new underground parking garage with its entrance located at the North Palmer Road intersection with North Wood Road and exit located at the South Palmer Road intersection with South Wood Road Option G: new parking facility along South Palmer Road between gates 4 and 5 (USU Alternative 1)
7	Option B: new underground parking garage with its entrance and exit located along North Palmer Road (G-Lot) Option G: new parking facility along South Palmer Road between gates 4 and 5 (USU Alternative 1)
8	Option C: new parking garage in the industrial/warehouse area accessed from Grounds Road Option G: new parking facility along South Palmer Road between gates 4 and 5 (USU Alternative 1)
9	Option D: new parking garage accessed from Stokes Road (H-Lot) Option G: new parking facility along South Palmer Road between gates 4 and 5 (USU Alternative 1)
10	Option E: new parking garage accessed from Taylor Road adjacent to the proposed Wounded Warrior Barracks Option G: new parking facility along South Palmer Road between gates 4 and 5 (USU Alternative 1)

Figure 4-14: Proposed Parking Facility Locations



This study focused on the external intersections and arterials, internal intersections and gate counts, internal parking, and bicycle/pedestrian impacts. Together, these systems provide an overall examination of the potential impacts of implementing any of the ten proposed 2018 Build Alternatives to NSA Bethesda and nearby arterials.

4.7.4 2018 Transportation Impacts: Action Operations Analysis

CLV analysis is required by the MSHA and M-NCPPC to determine intersection operations for all external signalized intersections (see Section 3.7.1.2). Since the CLV method is not as accurate a method to analyze unsignalized intersections and does not provide traffic delay or density, the study also included the HCM analysis as a secondary analysis method. Based upon the vehicle delay, the HCM analysis determines the LOS, which follows the same lettering as the CLV, but is calculated differently from the CLV and should not be compared to the CLV LOS. The HCM was used as a primary analysis method for the one external unsignalized intersection. For each intersection, the differences between the projected 2018 No Build condition and the given Build Alternative were measured.

For each Build Alternative, 16 external signalized intersections, plus 1 unsignalized intersection were analyzed. The 17 intersections covered three arterials, Rockville Pike, Jones Bridge Road, and West Cedar Lane.

4.7.4.1 Critical Lane Volume Analysis

Based upon the AM peak hour CLV analysis, several intersections LOS would change; however, it is important to note that no intersections would change to a failing LOS. Build Alternative 9 would change from a LOS of A to B at the #8 Rockville Pike at Wilson Drive intersection. This would reflect the combination of new staff trips originating from the north and entering the installation at Gate #2 destined for the new USU Alternative 1 parking structure, and shifted staff trips originating from the north entering the installation at Gate #3 destined for the new parking structure in H-Lot. The #9 Rockville Pike at South Wood Road (Gate #2) intersection would change from a LOS B to C for Build Alternatives 1, 4 and 6 through 10. Build Alternative 1 would include a shift in exiting patient trips from Gate #1 to Gate #2 using the new underground parking structure, thus an increase of traffic at intersection #9. Build Alternatives 4 and 9 would include new staff trips originating from the north entering Gate #3, destined for the new parking structure in H-Lot. Build Alternatives 6 through 10 would include new staff trips originating from the north entering Gate #2, destined for the new USU Alternative 1 parking structure. The LOS for all other external intersections would not change as a result of the proposed actions. Table 4-26 shows the AM peak hour CLV summary.

Table 4-26: AM Peak Hour CLV Summary

	Critical Lane Volume - LOS	NB	Alternatives									
			1	2	3	4	5	6	7	8	9	10
1.	Rockville Pike & Grosvenor Lane	D	D	D	D	D	D	D	D	D	D	D
2.	Rockville Pike & Pooks Hill Road	D	D	D	D	D	D	D	D	D	D	D
3.	Old Georgetown Road & Oakmont Avenue/Cedar Lane	D	D	D	D	D	D	D	D	D	D	D
4.	Locust Avenue/West Drive & Cedar Lane	A	A	A	A	A	A	A	A	A	A	A
5.	Rockville Pike & Cedar Lane	E	E	E	E	E	E	E	E	E	E	E
6.	Rockville Pike & North Drive/School Driveway*	B	B	B	B	B	B	B	B	B	B	B
7.	Rockville Pike & NIH Delivery Entrance/North Wood Road (Gate #1)	A	A	A	A	A	A	A	A	A	A	A
8.	Rockville Pike & Wilson Drive	A	A	A	A	A	A	A	A	A	B	A
9.	Rockville Pike & South Drive/South Wood Road (Gate #2)	B		B	B		B					
10.	Rockville Pike & Center Drive/Jones Bridge Road	A	A	A	A	A	A	A	A	A	A	A
11.	Gunnell Road (Gate #3)/Glenbrook Pkwy & Jones Bridge Road	A	A	A	A	A	A	A	A	A	A	A
12.	Grier Road (Gate #4) & Jones Bridge Road	A	A	A	A	A	A	A	A	A	A	A
13.	University Road (Gate #5) & Jones Bridge Road	A	A	A	A	A	A	A	A	A	A	A
14.	Connecticut Avenue & Jones Bridge Road & Kensington Parkway	E	E	E	E	E	E	E	E	E	E	E
15.	Manor Road & Jones Bridge Road	A	A	A	A	A	A	A	A	A	A	A
16.	Jones Bridge Road & Jones Mill Road	B	B	B	B	B	B	B	B	B	B	B
17.	Rockville Pike/Wisconsin Avenue & Woodmont Avenue/Glenbrook Parkway	A	A	A	A	A	A	A	A	A	A	A

* HCM used to calculate this unsignalized intersection

Since the CLV process was not used to evaluate unsignalized intersections, HCM analysis was used as a primary analysis tool for intersection #6 Rockville Pike at North Drive/School Driveway, which had a LOS of B for all Build Alternatives shown in Table 4-24.

Based upon the PM peak hour CLV analysis, the LOS at several intersections would change; however, it is important to note that no intersections would change to a failing LOS. The #8 Rockville Pike at Wilson Drive intersection would change from a LOS A to B for Build Alternatives 4 and 9, due to the increase in traffic passing through this intersection from both Gate #3, originating from the new H-Lot parking structure and from Gate #2, originating from the new USU alternative parking structures. The #12 Jones Bridge Road at Grier Road (Gate #4) intersection would change from a LOS of B to C for Build Alternatives 1, 2, 4, 6, 7, and 9, reflecting the new staff trips exiting through Gate #4, originating at the new USU parking structures. The LOS for all other external intersections would not change as a result of the proposed actions. Table 4-27 shows the PM peak hour CLV summary.

Table 4-27: PM Peak Hour CLV Summary

Critical Lane Volume - LOS	NB	Alternatives									
		1	2	3	4	5	6	7	8	9	10
1. Rockville Pike & Grosvenor Lane	D	D	D	D	D	D	D	D	D	D	D
2. Rockville Pike & Pooks Hill Road	D	D	D	D	D	D	D	D	D	D	D
3. Old Georgetown Road & Oakmont Avenue/Cedar Lane	E	E	E	E	E	E	E	E	E	E	E
4. Locust Avenue/West Drive & Cedar Lane	A	A	A	A	A	A	A	A	A	A	A
5. Rockville Pike & Cedar Lane	C	C	C	C	C	C	C	C	C	C	C
6. Rockville Pike & North Drive/School Driveway*	B	B	B	B	B	B	B	B	B	B	B
7. Rockville Pike & NIH Delivery Entrance/North Wood Road (Gate #1)	B	B	B	B	B	B	B	B	B	B	B
8. Rockville Pike & Wilson Drive	A	A	A	A	**B**	A	A	A	A	**B**	A
9. Rockville Pike & South Drive/South Wood Road (Gate #2)	B	B	B	B	B	B	B	B	B	B	B
10. Rockville Pike & Center Drive/Jones Bridge Road	A	A	A	A	A	A	A	A	A	A	A
11. Gunnell Road (Gate #3)/Glenbrook Pkwy & Jones Bridge Road	B	B	B	B	B	B	B	B	B	B	B
12. Grier Road (Gate #4) & Jones Bridge Road	B	**C**	**C**	B	**C**	B	**C**	**C**	B	**C**	B
13. University Road (Gate #5) & Jones Bridge Road	B	B	B	B	B	B	B	B	B	B	B
14. Connecticut Avenue & Jones Bridge Road & Kensington Parkway	F	F	F	F	F	F	F	F	F	F	F
15. Manor Road & Jones Bridge Road	B	B	B	B	B	B	B	B	B	B	B
16. Jones Bridge Road & Jones Mill Road	B	B	B	B	B	B	B	B	B	B	B
17. Rockville Pike/Wisconsin Avenue & Woodmont Avenue/Glenbrook Parkway	A	A	A	A	A	A	A	A	A	A	A

* HCM used to calculate this unsignalized intersection.

Since the CLV process was not used to evaluate unsignalized intersections, HCM analysis was used as a primary analysis tool for intersection #6 Rockville Pike at North Drive/School Driveway, which had a LOS of B for all Build Alternatives shown in Table 4-27.

4.7.4.2 Highway Capacity Manual (HCM) Analysis

The HCM analysis was used as a secondary analysis tool to evaluate the ten Build Alternatives. The complete HCM analysis summary and individual HCM Build Alternative can be found in Appendix D.

4.7.4.3 Arterial Analysis Summary

The arterial analysis was performed as a requirement for M-NCPPC's Policy Area Mobility Review for Rockville Pike, Jones Bridge Road, and West Cedar Lane. The analysis consisted of calculating the travel speed and travel time from one end of the corridor to the other along the three corridors and comparing the travel speed between the No Build condition and Build Alternatives.

Based upon the AM peak hour arterial analysis, the greatest difference in travel speeds between the No Build condition and Build Alternatives would be 4 percent for Alternatives 4 and 9 along Jones Bridge Road westbound. Both of these Build Alternatives would have a similar travel pattern, consisting of a shift in travel from Gate #1 to Gate #3 from north of the installation using Rockville Pike and Jones Bridge Road to access the new parking facility serving Building C located in H-Lot. The shift in trips would add more traffic to intersection #10 and #11 (Rockville Pike and Gunnell Road respectively) along Jones Bridge Road, thus extending the green times to accommodate the increased vehicle turning movements and delaying the Jones Bridge Road westbound approaches to these intersections. Table 4-28 shows the AM peak hour arterial summary.

Table 4-28: AM Peak Hour Arterial Summary

Arterial Analysis - Percent Difference from No Build Condition Travel Speed		Alternatives									
		1	2	3	4	5	6	7	8	9	10
1. Rockville Pike	**Northbound**	2%	1%	1%	3%	1%	2%	2%	2%	3%	2%
	Southbound	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%
2. Jones Bridge Road	**Eastbound**	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%
	Westbound	2%	2%	3%	4%	3%	2%	2%	2%	4%	3%
3. West Cedar Lane	**Eastbound**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Westbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Based upon the PM peak hour arterial analysis, the greatest difference in travel speeds between the No Build condition and Build Alternatives would be 3 percent for all Build Alternatives along Rockville Pike northbound. This reflects the increase in traffic exiting through Gate #2 from the new USU parking structure sites and heading north toward the Capital Beltway or I-270. In addition, there would be a 3 percent difference in travel time for Build Alternatives 1, 2, and 9. This reflects the Build Alternatives with the greatest amount of new trips exiting through Gate #4 and heading east toward Connecticut Avenue. The higher the volume exiting through Gate #4 to head east on Jones Bridge Road, the longer the delay for the existing eastbound approach at #12 Jones Bridge Road at Grier Road intersection. Table 4-29 shows the PM peak hour arterial summary.

Table 4-29: PM Peak Hour Arterial Summary

Arterial Analysis - Percent Difference from No Build Condition Travel Speed		Alternatives									
		1	2	3	4	5	6	7	8	9	10
1. Rockville Pike	**Northbound**	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Southbound	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%
2. Jones Bridge Road	**Eastbound**	3%	3%	0%	2%	0%	2%	2%	0%	3%	0%
	Westbound	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
3. West Cedar Lane	**Eastbound**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Westbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

In addition, the travel speeds, the travel times and arterial LOS comparison between the No Build condition and Build Alternatives can be found in Appendix D, Tables 88.

4.7.4.4 Internal Intersection Summary

The HCM method was used to calculate the LOS for 13 internal intersections, including a proposed intersection at South Palmer Road and South Wood Road serving the exit ramp from the underground parking garage. Each alternative shifted travel patterns around NSA Bethesda, lowering the LOS for some intersections, while raising the LOS for others. For each intersection, the difference between the projected 2018 No Build condition and given Build Alternative was measured.

Based on the AM peak hour HCM analysis, Build Alternative 1 and 2 would improve from a LOS of B to A at the #20 R.B. Brown Drive at Garage 54 Entrance intersection, but worsen from a LOS of A to B at the #24 East Palmer Road at North Palmer Road intersection. This would be due to patient trips entering through Gate #1 shifted from R.B. Brown Drive to the new underground garage and new staff trips entering through Gate #1, headed to the new USU Alternative 2 parking structure in N-Lot passing through the #24 intersection.

Build Alternative 3 and 5 would improve from a LOS of B to A at the #20 R.B. Brown Drive at Garage 54 Entrance intersection, but worsen from a LOS of B to C at the #18 R.B. Brown Drive at North Palmer Road intersection, and LOS A to B at the #24 East Palmer Road at North Palmer Road, #25 East Palmer Road at Rixey Road, and #26 East Palmer Road at Gunnell Road intersections. This would be due to staff trips entering through Gate #1 shifted from R.B. Brown Drive to the new parking structures along Taylor Road and Grounds Road passing through #18 and #24 intersections and new staff trips entering through Gate #1, headed to the new USU Alternative 2 parking structure in N-Lot passing through #18, #24, and #25 intersections. There would also be new trips entering through Gate #3 passing through #25 and #26 intersections. The #19 R.B. Brown Drive and Building 54 Exit

intersection would change from a LOS of C to D, reflecting the new staff pedestrian trips crossing at this intersection from the new parking structures on Taylor Road or Grounds Road.

Build Alternative 4 would improve from a LOS of C to B at the #19 R.B. Brown Drive and Building 54 Exit intersection and from a LOS of B to A at the #20 R.B. Brown Drive at Garage 54 Entrance intersection, but worsen from a LOS of A to B at the #24 East Palmer Road at North Palmer Road and #26 East Palmer Road at Gunnell Road intersections. This would be due to staff trips shifted from R.B. Brown Drive to the new parking facility in H-Lot, entering through Gate #3 and passing through the #26 intersection. There would also be new staff trips entering through Gate #1 headed to the new USU Alternative 2 parking structure passing through the #24 intersection.

Build Alternatives 6 and 7 would improve from a LOS of B to A at the #18 R.B. Brown Drive at North Palmer Road and #20 R.B. Brown Drive at Garage 54 Entrance intersections, but worsen from a LOS of A to B at the #23 R.B. Brown Drive at South Palmer Road, #27 Stokes Road at South Palmer Road, and #28 Grier Road at South Palmer Road intersections. This would be due to patient trips entering through Gate #1 shifted to the new underground parking structure and new staff trips entering through Gate #2 and passing through #23, #27, and #28 intersections destined for the USU Alternative 1 parking structure.

Build Alternatives 8 and 10 would improve from a LOS of B to A at the #20 R.B. Brown Drive at Garage 54 Entrance intersection, but worsen from a LOS of A to B at the #24 East Palmer Road at North Palmer Road, and #26 East Palmer Road at Gunnell Road intersections. This would be due to staff trips shifted from R.B. Brown Drive to the new parking structures entering through Gate #1 and destined to Taylor and Grounds Roads passing through the #24 intersection and shifted staff trips entering through Gate #3 and passing through the #26 intersection headed to Taylor and Grounds Roads. The #19 R.B. Brown Drive and Building 54 Exit intersection would change from a LOS of C to D, reflecting the new pedestrian trips crossing at this intersection from the new parking structures on Taylor Road or Grounds Road.

Build Alternative 9 would improve from a LOS of B to A at the #18 R.B. Brown Drive at North Palmer Road and #20 R.B. Brown Drive at Garage 54 Entrance intersections, and LOS of C to B at the #19 R.B. Brown Drive and Building 54 Exit intersection, but worsen from a LOS of A to B at the #26 East Palmer Road at Gunnell Road, #27 Stokes Road at South Palmer Road, and #28 Grier Road at South Palmer Road intersections. This would be due to staff trips shifted from R.B. Brown Drive to the new parking facility in H-Lot, entering through Gate #3 and passing through the #26 intersection and entering through Gate #4 and passing through the #27 and #28 intersections. Table 4-30 shows the AM peak hour HCM internal summary.

Table 4-30: AM Peak Hour HCM Internal Summary

Highway Capacity Manual - LOS	NB	Alternatives									
		1	2	3	4	5	6	7	8	9	10
18. Parking Lot/R.B. Brown Drive & North Palmer Road	B	B	B		B				B		B
19. R.B. Brown Drive & America Garage/Garage 54 Exit	C	C	C	D	B	D	C	C	D	B	D
20. R.B. Brown Drive & Garage 54 Entrance	B										
21. R.B. Brown Drive & Drop-Off Loop Entrance/Garage 55 Exit	A	A	A	A	A	A	A	A	A	A	A
22. R.B. Brown Drive & Drop-Off Loop Exit/Garage 55 Entrance	A	A	A	A	A	A	A	A	A	A	A
23. R.B. Brown Drive & South Palmer Road	A	A	A	A	A	A	B	B	A	A	A
24. East Palmer Road & North Palmer Road/Taylor Road	A						A	A		A	
25. East Palmer Road & Visitor Garage Exit/Rixey Road	A	A	A	B	A	B	A	A	A	A	A
26. East Palmer Road/Gunnell Road & Stokes Road	A	A	A				A	A			
27. AFRRI Driveway/Stokes Road & South Palmer Road	A	A	A	A	A	A	B	B	A	B	A
28. University Road/Grier Road & South Palmer Road	A	A	A	A	A	A			A		A
29. University Road & South Palmer Road	A	A	A	A	A	A	A	A	A	A	A
31. South Wood Road & South Palmer Road	--	A	--	--	--	--	A	--	--	--	--

Based on the PM peak hour HCM analysis, Build Alternatives 1 and 2 would worsen from a LOS of B to C at the #26 East Palmer Road at Gunnell Road and #28 Grier Road at South Palmer Road intersections. This would be due new staff trips entering through Gate #3, headed to the new USU Alternative 2 parking structure in N-Lot passing through the #26 intersection and new staff trips exiting through Gate #2, originating from the new USU Alternative 2 parking structure.

Build Alternatives 3 and 5 would improve from a LOS of B to A at the #21 R.B. Brown Drive at Garage 55 Exit and #23 R.B. Brown Drive at South Palmer Road intersection, but worsen from a LOS of B to C at the #24 East Palmer Road at North Palmer Road and #26 East Palmer Road at Gunnell Road intersections. This would be due to staff trips shifted from R.B. Brown Drive to the new parking structures along Taylor Road and Grounds Road, passing through the #24 intersection and exiting through Gate #1 and shifted staff trips exiting through Gate #3, originating along Taylor and Grounds Roads passing through the #26 intersection.

Build Alternative 4 would improve from a LOS of C to B at the #18 R.B. Brown Drive at North Palmer Road and from a LOS of B to A at the #21 R.B. Brown Drive at Garage 55 Exit intersection, but worsen from a LOS of B to D at the #26 East Palmer Road at Gunnell Road intersection and

from a LOS of B to C at the #28 Grier Road at South Palmer Road intersection. This would be due to staff trips shifted from R.B. Brown Drive to the new parking facility in H-Lot, exiting through Gate #3 and passing through the #26 intersection. There would also be new staff trips exiting through Gate #4 originating at the new USU Alternative 2 parking structure passing through the #28 intersection.

Build Alternatives 6 and 7 would worsen from a LOS of B to C at the #28 Grier Road at South Palmer Road intersection as a result of new staff trips exiting through Gates 2 and 4 passing through intersection #28 originating at the USU Alternative 1 parking structure.

Build Alternatives 8 and 10 would improve from a LOS of B to A at the #21 R.B. Brown Drive at Garage 55 Exit and #23 R.B. Brown Drive at South Palmer Road intersection, but worsen from a LOS of B to C at the #26 East Palmer Road at Gunnell Road intersection. This would be due to staff trips shifted from R.B. Brown Drive to the new parking structures along Taylor Road and Grounds Road, exiting through Gate #3 and passing through intersection #26 originating along Taylor and Grounds Roads.

Build Alternative 9 would improve from a LOS of C to B at the #18 R.B. Brown Drive at North Palmer Road intersection and from a LOS of B to A at the #21 R.B. Brown Drive at Garage 55 Exit intersection, but worsen from a LOS of B to D at the #26 East Palmer Road at Gunnell Road intersection and from a LOS of B to C at the #28 Grier Road at South Palmer Road intersection. This would be due to staff trips shifted from R.B. Brown Drive to the new parking facility in H-Lot, exiting through Gate #3 and passing through the #26 intersection. There would also be new staff trips exiting through Gate #4 originating at the new USU Alternative 1 parking structure passing through the #28 intersection. Table 4-31 shows the PM peak hour HCM internal summary.

While there would be shifts in the LOS for various internal intersections, the lowest LOS would be a D, which is acceptable for an intersection located in an urban area. Based on this analysis, there would be no significant impact on the internal intersections by any of the Build Alternatives.

Table 4-31: PM Peak Hour HCM Internal Summary

Highway Capacity Manual - LOS		NB	Alternatives									
			1	2	3	4	5	6	7	8	9	10
18.	Parking Lot/R.B. Brown Drive & North Palmer Road	C	C	C	C	**B**	C	C	C	C	**B**	C
19.	R.B. Brown Drive & America Garage/Garage 54 Exit	*	*	*	*	*	*	*	*	*	*	*
20.	R.B. Brown Drive & Garage 54 Entrance	A	A	A	A	A	A	A	A	A	A	A
21.	R.B. Brown Drive & Drop-Off Loop Entrance/Garage 55 Exit	B	B	B	**A**	**A**	**A**	B	B	**A**	**A**	**A**
22.	R.B. Brown Drive & Drop-Off Loop Exit/Garage 55 Entrance	A	A	A	A	A	A	A	A	A	A	A
23.	R.B. Brown Drive & South Palmer Road	B	B	B	**A**	B	**A**	B	B	**A**	B	**A**
24.	East Palmer Road & North Palmer Road/Taylor Road	B	B	B	**C**	B	**C**	B	B	B	B	B
25.	East Palmer Road & Visitor Garage Exit/Rixey Road	B	B	B	B	B	B	B	B	B	B	B
26.	East Palmer Road/Gunnell Road & Stokes Road	B	**C**	**C**	**C**	**D**	**C**	B	B	**C**	**D**	**C**
27.	AFRRI Driveway/Stokes Road & South Palmer Road	B	B	B	B	B	B	B	B	B	B	B
28.	University Road/Grier Road & South Palmer Road	B	**C**	**C**	B	**C**	B	**C**	**C**	B	**C**	B
29.	University Road & South Palmer Road	A	A	A	A	A	A	A	A	A	A	A
31.	South Wood Road & South Palmer Road	--	B	--	--	--	--	B	--	--	--	--

*** HCM unsignalized intersection capacity analysis result in abnormally high levels of delay at intersections with large pedestrian volumes. This intersection would perform with a similar LOS as the AM conditions, LOS C.**

4.7.4.5 Gate Count Summary

Counts at the five gates were made on 18, 19, 20, and 26 October 2011 under existing conditions. The projected trips to each gate under the No Build condition and 10 Build Alternatives were calculated from each alternative's projected intersection turning movement counts, used in previous sections to determine the future intersection operations.

The gate volumes would differ for each alternative, reflecting the shift in patient or staff trips between gates to access the new parking structure serving Building C or by new staff trips destined to the new USU Alternative parking structure sites.

Table 4-32 shows the AM peak hour 2018 volumes by gate, and Table 4-33 shows the AM peak hour 2018 percent change by gate. Note that the outbound direction at Gate #4 is closed during the AM peak hour; therefore, a zero volume is shown. Also note that the volumes shown for inbound Gate #4 would likely be higher than shown as the existing gate counts were obtained during a period when Gate #4 was the temporary truck entrance, thus passenger vehicles arriving from the east along Jones Bridge Road would have been required to use Gate #3 or #5 instead of Gate #4.

Table 4-32: AM Peak Hour 2018 Volumes by Gate

Gates - Proposed Counts		Direction	NB	Alternatives									
				1	2	3	4	5	6	7	8	9	10
7	North Wood Road (Gate #1)	inbound	427	491	488	491	394	491	427	396	423	314	427
		outbound	117	67	115	116	97	117	67	115	116	97	117
9	South Wood Road (Gate #2)	inbound	190	190	190	152	152	152	254	285	220	241	216
		outbound	91	156	107	107	109	106	156	108	107	111	106
11	Gunnell Road (Gate #3)	inbound	254	276	274	314	398	314	254	254	291	372	292
		outbound	122	127	127	127	141	127	122	122	122	137	122
12	Grier Road (Gate #4)	inbound	48	48	48	0	26	0	128	128	31	136	28
		outbound	0	0	0	0	0	0	0	0	0	0	0
13	University Road (Gate #5)	inbound	135	193	190	293	205	293	135	135	233	135	235
		outbound	6	20	18	20	17	20	25	25	25	25	25

Table 4-33: AM Peak Hour 2018 Percent Change by Gate

Gates - Percent Change		Direction	NB	Alternatives									
				1	2	3	4	5	6	7	8	9	10
7	North Wood Road (Gate #1)	inbound	427	13%	13%	13%	-8%	13%	0%	-8%	-1%	-36%	0%
		outbound	117	-75%	-2%	-1%	-21%	0%	-75%	-2%	-1%	-21%	0%
9	South Wood Road (Gate #2)	inbound	190	0%	0%	-25%	-25%	-25%	25%	33%	14%	21%	12%
		outbound	91	42%	15%	15%	17%	14%	42%	16%	15%	18%	14%
11	Gunnell Road (Gate #3)	inbound	254	8%	7%	19%	36%	19%	0%	0%	13%	32%	13%
		outbound	122	4%	4%	4%	13%	4%	0%	0%	0%	11%	0%
12	Grier Road (Gate #4)	inbound	48	0%	0%	-100%	-85%	-100%	63%	63%	-55%	65%	-71%
		outbound	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13	University Road (Gate #5)	inbound	135	30%	29%	54%	34%	54%	0%	0%	42%	0%	43%
		outbound	6	70%	67%	70%	65%	70%	76%	76%	76%	76%	76%

Table 4-34 shows the AM peak hour 2018 gate volume change by gate and Table 4-35 shows the AM peak hour 2018 percent change by gate. Note that the inbound direction at Gate #4 is closed during the PM peak hour; therefore, a zero volume is shown.

Table 4-34: PM Peak Hour 2018 Volume Change by Gate

Gates - Proposed Counts		Direction	NB	Alternatives									
				1	2	3	4	5	6	7	8	9	10
7	North Wood Road (Gate #1)	inbound	85	112	111	112	96	112	85	83	84	70	85
		outbound	464	423	443	453	334	456	431	451	460	342	464
9	South Wood Road (Gate #2)	inbound	102	102	102	97	97	97	129	131	125	127	124
		outbound	198	306	283	235	250	232	298	278	228	251	224
11	Gunnell Road (Gate #3)	inbound	166	175	175	180	191	180	166	166	171	182	171
		outbound	373	371	371	411	498	412	373	373	413	500	414
12	Grier Road (Gate #4)	inbound	0	0	0	0	0	0	0	0	0	0	0
		outbound	342	433	430	328	429	324	423	423	318	433	314
13	University Road (Gate #5)	inbound	7	32	30	32	27	32	41	41	41	42	41
		outbound	7	0	0	105	0	108	7	7	113	7	116

Table 4-35: AM Peak Hour 2018 Percent Change by Gate

Gates - Percent Change		Direction	NB	Alternatives									
				1	2	3	4	5	6	7	8	9	10
7	North Wood Road (Gate #1)	inbound	85	24%	23%	24%	11%	24%	0%	-2%	-1%	-21%	0%
		outbound	464	-10%	-5%	-2%	-39%	-2%	-8%	-3%	-1%	-36%	0%
9	South Wood Road (Gate #2)	inbound	102	0%	0%	-5%	-5%	-5%	21%	22%	18%	20%	18%
		outbound	198	35%	30%	16%	21%	15%	34%	29%	13%	21%	12%
11	Gunnell Road (Gate #3)	inbound	166	5%	5%	8%	13%	8%	0%	0%	3%	9%	3%
		outbound	373	-1%	-1%	9%	25%	9%	0%	0%	10%	25%	10%
12	Grier Road (Gate #4)	inbound	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		outbound	342	21%	20%	-4%	20%	-6%	19%	19%	-8%	21%	-9%
13	University Road (Gate #5)	inbound	7	78%	77%	78%	74%	78%	83%	83%	83%	83%	83%
		outbound	7	-100%	-100%	93%	-100%	94%	0%	0%	94%	0%	94%

4.7.4.6 Internal Parking

The 2018 No Build condition parking facility inventory provided a base for determining how much parking would potentially be available for the 270 new employees anticipated to be added to the installation as part of the ten Build Alternatives. For alternatives where existing parking lots would be replaced by a new parking facility, those lost spaces were assumed to be provided within the new parking structure. This would reduce the number of available new spaces for new staff expected by 2018.

The study assumed the proposed new parking structure in the existing N-Lot would have 62 spaces assigned to former N-Lot users. Additionally, the study assumed the proposed new parking structure in H-Lot would have 110 spaces assigned to former H-Lot users and the proposed new parking structure in Z-Lot would have 17 spaces assigned

to former Z-Lot users. If the G-Lot was affected by the new underground parking facility, then the study assumed that 82 spaces in the new USU parking structure site would be assigned to those users.

Build Alternatives 1, 2, 3, 4, 5, 8 and 9 would displace existing parking. Existing employees with parking spaces in the displaced lots would be re-assigned spaces in other lots on campus or in new lots. Therefore, the number of new staff trips generated by any given Build Alternative would be calculated by subtracting the number of displaced staff parking spaces from the total number of staff spaces to be provided under the alternative. The number of peak hour trips used to calculate traffic impacts was derived by comparing the number of remaining parking spaces to the maximum trip generation rate of 270 new employees. If the remaining spaces were equal or greater than 270, then all 270 generated trips were included in the alternative. If less than 270 spaces remained, then the remaining number of spaces was used as the trip generation rate for the alternative. The total patient, visitor and barracks spaces were also calculated. However, the new trips were only staff; therefore, staff spaces were the only focus of the traffic study. Table 4-36 shows the parking summary.

The total NSA Bethesda available parking is bound by the NCPC staff parking ratio of one space for every three employees. To ensure that NSA Bethesda would adhere to NCPC policy and to determine if additional staff parking could be constructed after the 2018 proposed buildings and parking structures are complete, the NCPC ratio was calculated for the existing condition, project 2018 No Build condition and Build Alternatives. Under all Build Alternatives, the staff parking ratio would meet the NCPC ratio of one space: three employees. Table 4-36 shows the parking summary.

4.7.4.7 Bicycle and Pedestrian Impacts

The bicycle and pedestrian network were discussed in the existing conditions, providing the Bicycle and Pedestrian Impact Statement elements required in the M-NCPPC-LATR. This included existing bicycle routes, storage racks, and counts as well as pedestrian counts, sidewalk extent and widths, and ADA compliant curbing.

Each alternative was evaluated for bicycle and pedestrian impacts, including the addition of pedestrian trips at each appropriate intersection to determine the impact, if any, to vehicle operations. For Build Alternatives 1-5, pedestrian flows between the proposed USU Alternative 2 parking structure in N-Lot and the Medical Buildings were analyzed and sidewalk widths were checked to ensure a safe walkway would exist. For the Build Alternatives 6-10, an additional intersection was included to connect with the proposed USU Alternative 1 parking structure south of South Palmer Road across from the USU. For Build Alternatives 3-5, and 8-10, pedestrian flows between the proposed parking structures along Taylor Road or Grounds Road were analyzed and sidewalk widths were checked to ensure a safe walkway would exist. For Build Alternatives 4 and 9, the Stokes Road at

Gunnell Road intersection was analyzed to connect the proposed H-Lot parking structure to the Medical Buildings.

Table 4-36: Parking Summary

ALT				Total Staff	Total Patient	Total Visitor	Total Barracks	Total Gov't	Capacity	NCPC
Existing Condition				3,525	2,436	1,120	457	148	7,686	3.32
No Build Condition				3,484	2,286	1,512	601	229	8,112	3.54
ALT	**New Staff spaces**	**New Patient spaces**	**Spaces Shifted**	**Total Staff**	**Total Patient**	**Total Visitor**	**Total Barracks**	**Total Gov't**	**Capacity**	**NCPC**
Alt 1:	338	500	N-LOT=62	3,822	2,786	1,512	601	229	8,950	3.30
Alt 2:	256	500	G-LOT=82 N-LOT=62	3,740	2,786	1,512	601	229	8,868	3.37
Alt 3:	321	500	N-LOT=62 Z-LOT=17	3,805	2,786	1,512	601	229	8,933	3.31
Alt 4:	228	500	N-LOT=62 H-LOT=110	3,712	2,786	1,512	601	229	8,840	3.40
Alt 5:	338	500	N-LOT=62	3,822	2,786	1,512	601	229	8,950	3.30
Alt 6:	400	500		3,884	2,786	1,512	601	229	9,012	3.25
Alt 7:	318	500	G-LOT=82	3,802	2,786	1,512	601	229	8,930	3.32
Alt 8:	383	500	Z-LOT=17	3,867	2,786	1,512	601	229	8,995	3.26
Alt 9:	290	500	H-LOT=110	3,774	2,786	1,512	601	229	8,902	3.34
Alt 10:	400	500		3,884	2,786	1,512	601	229	9,012	3.25

Existing Condition ratio based upon population of 11,686
No Build Condition ratio based upon population of 12,341
Build Alternatives ratio based upon population of 12,611

Table 4-37 shows the AM peak hour 2018 Build Alternative new pedestrian trips and Table 4-38 shows the PM peak hour 2018 Build Alternative new pedestrian trips. These new trips would be the result of shifted and new staff trips required to walk from one of the new parking structures to their office in the Medical Building or USU campus.

Table 4-37: AM Peak Hour 2018 Build Alternative New Pedestrian Trips

Pedestrian Trips Added	Alternatives									
	1	2	3	4	5	6	7	8	9	10
R.B. Brown Drive & America Garage/Garage 54 Exit			285		294			285		287
R.B. Brown Drive & South Palmer Road	17	48	26	308	17	17	48	22	311	17
East Palmer Road & North Palmer Road/Taylor Road			285		294			285		287
East Palmer Road/Gunnell Road & Stokes Road				230					230	
AFRRI Driveway/Stokes Road & South Palmer Road	17	48	26	78	17	17	48	22	81	17
University Road/Grier Road (Gate #4) & South Palmer Road						178	202	174	242	178

Table 4-38: PM Peak Hour 2018 Build Alternative New Pedestrian Trips

Pedestrian Trips Added	Alternatives									
	1	2	3	4	5	6	7	8	9	10
R.B. Brown Drive & America Garage/Garage 54 Exit			297		305			297		301
R.B. Brown Drive & South Palmer Road	16	31	20	320	16	16	31	24	322	16
East Palmer Road & North Palmer Road/Taylor Road			297		305			297		301
East Palmer Road/Gunnell Road & Stokes Road				239					239	
AFRRI Driveway/Stokes Road & South Palmer Road	16	31	20	81	16	16	31	24	83	16
University Road/Grier Road (Gate #4) & South Palmer Road						209	215	208	276	209

In addition to NSA Bethesda having adequate sidewalk widths and curbing, the NSA Bethesda Accessibility Capital Improvement Plan recommends improving the sidewalks along the entire length of R.B. Brown Drive and Taylor Road, which would improve the future connections between the Medical Buildings and the proposed parking structures along Taylor and Grounds Roads.

Although alternatives to the underground parking garage are more distant from the Medical Facilities where most of the staff work, based upon the existing sidewalk widths, available internal and external sidewalk network, and available bicycle external network and internal storage racks, there would be no significant impact from implementing any of the alternatives with regard to bicycle and pedestrian accessibility at NSA Bethesda.

4.7.5 Transportation Construction Impacts

The construction conditions include parking, sidewalk, and truck access through Gate #5. The parking section includes the NSA Bethesda plan for handling parking needs during the construction period. The sidewalk section includes discussion of the potential temporary impacts on the internal and external network due to construction activities, and the Gate #5 construction truck impacts consists of a trucking queue analysis to determine if any temporary measures might be recommended to mitigate potential queues.

4.7.5.1 Parking

Overall parking at NSA Bethesda is impacted on a daily basis due to major and minor construction projects. On the average day, approximately 100 spaces are lost to construction staging, storage, and contractor vehicles associated with both capital improvements and ongoing maintenance of existing facilities. These impacts are coordinated to allow for the least possible impact on the installation patient population.

To minimize impacts on installation parking from construction workers, the Navy would contractually limit construction worker parking to within the construction sites and lay down areas. It is anticipated that the limited construction parking would be utilized for contractor management staff, on-site government representatives, and visitors. The Navy would contractually commit construction contractors to provide designated off-site parking for construction workers who do not get parking spaces and to provide transportation to NSA Bethesda from the parking site to avoid use of public parking within the adjacent communities. The Navy would require documented verification of these provisions and to ensure compliance, may conduct security inspections and badge verifications at the installation entrance(s) or at the contractor-provided parking site.

The number of peak trips to the installation may temporarily increase due to construction worker trips during the construction period, which is projected to last 66 months. Additionally, staff commuting patterns may be temporarily altered due to shifts in parking locations. NSA Bethesda would seek to minimize impacts on parking and the road network during this period by employing constraints on construction worker parking (as described above) and the mitigation strategies discussed in Section 7.0.

4.7.5.2 Sidewalk Impacts

During the construction period within NSA Bethesda, there would be temporary sidewalk closings, temporary new connections provided to compensate for the sidewalk closings when necessary, and sidewalk impacts such as narrowed or torn up sidewalks.

As all construction would occur internally to the installation, the external sidewalk or bicycle network along Rockville Pike or Jones Bridge Road would not be significantly impacted.

These impacts would be short term and would not have any long-term impacts. NSA Bethesda would seek to minimize these impacts by employing the mitigation strategies discussed in Section 7.0.

4.7.5.3 Gate #5 Construction Truck Impacts

NSA Bethesda operates five Gates: two on Rockville Pike and three on Jones Bridge Road. Passenger vehicles may enter through any one of the five gates, depending on the hours of operation. However, trucks must enter through the newly upgraded Gate #5 and the CVIF and most exit through Gate #1.

Appendix D, Section 5.3 discusses the results of the Gate #5 trucks impact analysis. The analysis evaluated the impacts of the construction trucks related to the proposed actions. The study projected future construction trucks by first dividing the construction into two distinct periods. The initial period, scheduled to require approximately 2 years, would include the excavation or demolition required for the garage for the Medical Facilities Development, as well as the accessibility and appearance plan projects and utility upgrades. Estimates were developed for the maximum amount of earth or debris that could potentially be generated by excavation or demolition under each of the alternatives for the Medical Facility Facilities Development garage. The number of dump trucks required to remove this earth or debris from the installation was estimated under the assumption that all earth and debris would potentially require off-site disposal. The material requirements and resulting trucks for the other several smaller proposed projects that are currently scheduled to occur during the same period as the excavation or demolition for the parking garage were also added. To be conservative, one 250-day construction year was assumed and an average daily requirement for trucks was estimated.

The second period of construction was assumed to include all remaining projects, including necessary demolition of existing buildings and construction of Medical Facilities and the parking garage, the majority of utility upgrades, all proposed renovation, and the USU Expansion. Estimates were made of the construction materials needed to be brought onto the installation for new construction and renovation, and estimates were made of construction and demolition debris that would need to be removed during the same time period. The estimates were based upon average factors for nonresidential buildings determined by a study conducted for the USEPA by Franklin Associates. The types of trucks that would be used and their capacity were assumed based upon those typically used to support construction. It was also assumed, conservatively, that supply trucks used to bring in materials would not be used to remove the construction and demolition debris; rather, separate dump trucks that come on-site empty would be used to

remove the debris. Again, to be conservative, it was assumed that, although these actions are scheduled to occur over several years, all would take place over one construction year of 250 days. The resulting total tonnage coming on-site and being removed from the installation was then allocated to the trucks to derive an average requirement for trucks per day.

The result was 37 trucks per day during the second period. The second period required more trucks than the first and was therefore used as the number of trucks entering the facility each day on average. This estimate of 37 trucks per day was used for the analysis of construction traffic impacts.

The queue analysis consists of calculating the most severe case estimate for the number of trucks that would enter at Gate #5, the average length of time to inspect each truck, and determining the storage space to handle the truck demand.

To calculate the number of trucks entering Gate #5 during the AM peak hour, the existing peak hour number plus the estimated future peak hour number were summed. As surveyed, the existing peak hour was 24 trucks per hour. These included mail, food, contractors, and trash.

Based upon the assumptions discussed in the above, there would be approximately 37 additional construction trucks per day. Using the 24 hour Grier Road (Gate #4) automated traffic recorder ATR data used to calculate the existing volumes, the study obtained a 3 day sample of northbound traffic volumes. During the time the ATR was placed on Grier Road, Gate #4 served as the CVIF, with all other vehicles required to use one of the other four gates to enter the installation. This data provided a quality sample to calculate the maximum percent of daily trucks that would arrive during the peak hour. Based upon the data, an average of 17.51 percent of trucks arrived at the installation during the AM peak hour (average of 18.29 percent, 18.40 percent, and 15.83 percent). The resulting peak hour additional construction truck flow would be 7 trucks per hour (6.48 rounded to the next whole number).

The total number of trucks per hour (existing plus future) would be 31 trucks per hour in 2015. If the average time to inspect a truck was observed to be between 45 and 65 seconds, the study used the severe case scenario by rounding to the next minute or 2 minutes, with two trucks inspected at one time. This would result in the security staff processing 60 trucks per hour (60 minutes in an hour divided by 2 minutes inspection time, times two inspection stations).

Currently, the CVIF can store four tractor trailer trucks; two inspection slots with one truck queued directly behind. Based on 31 trucks per hour arriving during the AM peak hour and a uniform arrival rate, there would be no queue, as the existing facility can handle up to 60 trucks per hour.

As the arrival rates for the trucks would not be uniform, the Poisson distribution was used to calculate the probability of truck arrivals. According the Poisson distribution, there would be a probability of 32.33 percent that two, 14.29 percent that three, 5.27 percent that four, 1.66 percent that five, and 0.45 percent that six trucks would arrive during a 2 minute interval. Based upon these calculations, there would be a 95 percent or greater probability that no more than four trucks would arrive, the maximum number that the existing facility can store, and an 85 percent probability that no more than two trucks would arrive at the same time.

Since there would be less than a 2 percent probability that more than four trucks would arrive at the same time to Gate #5, and that this analysis assumes all four trucks would be tractor trailers, there would be no significant queue impact on the CVIF and Gate #5.

4.7.6 Proposed Actions: Recommendations

The existing conditions provided a starting point for analyzing the NSA Bethesda roadway system and approved external roadway network. The 2018 No Build condition was then developed using the background trips, planned development trips (adjusting to the No Build condition parking constraints), planned roadway improvements, planned transit improvements, and parking lot shifts due to planned lot closures. From the 2018 No Build condition, ten 2018 Build Alternatives were developed and analyzed to determine the effects on the external roadways, internal roadways, and bicycle/pedestrians.

For the external roadway, there were no significant impacts on any of the intersections or arterials when comparing the 2018 No Build condition to the 2018 Build Alternatives. Although some intersections would experience a slight decline in LOS, no intersections would shift to a failing LOS. Therefore, no mitigation measures are recommended for the external roadway intersections.

For the internal roadway network, there were no significant impacts on any of the intersections when comparing the 2018 No Build condition to the 2018 Build Alternatives. Therefore, no mitigation measures are recommended for the internal roadway intersections.

For the bicycle and pedestrian network, there are ample sidewalks, bike racks, and ADA compliant curbing at intersections where new pedestrian trips would occur. Therefore, no mitigation measures are recommended for the bicycle or pedestrian network. However, it is recommended that if one of the 2018 Build Alternatives 6 through 10 be implemented, signing and pedestrian markings clearly identify an appropriate crossing location between the new parking structure serving Building F and the USU. This recommendation is to accommodate the 161 AM peak hour and 193 PM peak hour new pedestrian trips created by the 220 USU employees being consolidated to NSA Bethesda.

It is also recommended that the Installation TMP continue to be implemented to reduce the number of vehicle trips on the external and internal roadway system by using the Metro, Montgomery County transit system, vanpools, carpools, and bicycle trails. The sustained implementation of the TMP would continue to ensure that the transportation system in the area functions efficiently.

4.7.7 Construction Impacts: Proposed Recommendations

To keep the installation functioning and to preserve staff parking during construction, NSA Bethesda would implement the following basic step. To minimize impacts on installation parking from construction workers, the Navy would contractually limit construction worker parking to within the construction sites and lay down areas. It is anticipated that the limited construction parking would be utilized for contractor management staff, on-site government representatives, and visitors. Further, for those construction contractors who do not receive on-site construction parking, the Navy would contractually require the contractors to utilize mass transit options to access the installation. The Navy would require documented verification of these provisions and to ensure compliance, may conduct security inspections and badge verifications at the installation entrance(s) or at the contractor-provided parking site. These steps would minimize the impact of the construction of NSA Bethesda's ultimate mission of medical care, medical research, and recovery services to aid our nation's wounded warriors.

To address the internal sidewalk needs to enable staff, patients, visitors, and residents to safely and easily access the installation, NSA Bethesda would provide signing to alert pedestrians of closed sidewalks and direct them to the temporary or alternative existing sidewalks through construction zones. In addition, NSA Bethesda construction contractors would install temporary barriers to protect pedestrians from vehicular traffic in areas where sidewalks are narrowed or shifted closer to the roadway. Lastly, any sidewalk shifts or closures would be announced to alert potential users of the pending sidewalk system changes.

The truck queue analysis determined that the existing truck volumes added to the projected additional short-term construction truck volumes would be less than the total number of trucks that the existing commercial vehicle inspections station can accommodate. In addition, the Navy would contractually limit the construction contractors to stagger their truck arrivals to operate within the capacity of the commercial vehicle inspection facility. An arrival analysis determined there would be less than a 2 percent probability that five trucks would arrive at the same time. Based upon this analysis, there would be no significant queuing impacts caused by the construction trucks at Gate #5.

4.8 Cultural Resources Consequences

4.8.1 Cultural Resources Impacts: Medical Facilities Development

There is one action alternative for the Medical Facilities Development but three alternatives to the proposed underground parking associated with it. See Figure 3-18 for the location of the Medical Facilities Development alternatives in relation to NSA Bethesda's historic properties.

Building C – Construction and Demolition

Demolition alone of Buildings 2, 4, 6, 7, and 8 would not have direct impacts on cultural resources; these buildings have all been determined ineligible for the NRHP. However, the replacement Building C would be attached to the rear or east of the Central Tower Block and be engaged with Buildings 3 and 5. The Central Tower Block or Building 1 is the prime landmark structure of NSA Bethesda due to its architectural distinction and association with President Franklin D. Roosevelt, as well as with achievements in the practice of military medicine. Buildings 3 and 5 are slightly later ancillary structures in a similar architectural style, also designed under the supervision of the Tower Block's architect, Paul Philippe Cret, and drawing significance from the same contexts. In terms of their status under surveys carried out in accordance with Section 110 of NHPA, Building 1 is listed on the NRHP, while the other two have been determined contributing elements of a historic district eligible for the NRHP. In practice, all three are given equal standing under Section 106 of NHPA, the part that requires Federal agencies to take into account the effect of their undertakings on NRHP resources. Under 36 CFR Part 800, the implementing regulations for NHPA Section 106, consultation with MHT is required to determine whether the effects, once identified, are adverse or not adverse.

As the substantial alteration of a historic building's setting may be considered to have an adverse effect under the regulations (36 CFR 800) implementing Section 106 of NHPA, the insertion of Building C into the core complex of the Central Tower Block and its neighboring two historic structures is a sensitive matter.

The current project description calls for a single 5-story 573,000 SF building to be built on the general footprint of the buildings to be demolished. Although the development of a concept design for Building C has not yet taken place, it is significant that the new building would be placed in a physical context very recently altered by the construction of Buildings 9A and 19 to the south and north of Building 1, respectively, and west of the buildings to be demolished. Buildings 19 and 63 are attached to the historic Buildings 3 and 5 in a way that reduces their outward architectural presence to two prongs extending northward into the courtyard framed by Buildings 19 and 63.

The design of Building C would be reviewed by MHT and NCPC (in accordance with National Capital Planning Act of 1952). The goal of MHT, which would be shared by NCPC, would be to avoid, minimize, or mitigate adverse effects to historic properties.

In general, many of the sensitive issues of designing sympathetic new buildings in the vicinity of the Central Tower Block have already been dealt with successfully for the earlier construction of the BRAC buildings, now complete. In reviewing the concept for Buildings 9A and 19 to the south and the north of the Tower Block, the two agencies collaborated on a statement of design guidelines which addressed the symmetry, and prominence and setting, i.e. the Front Lawn, of Building 1. The two agencies found that:

- The adjacent front planes of Building 19 (Outpatient Care Pavilion) and Building 9A (Inpatient Addition) cannot be forward (west) of the front of the wings of Building 1.
- The viewshed west of Building 1 is to remain unobstructed. The west footprints of Buildings 9A and 19, along Wood Drive, are to step away from the wings of Building 1.
- The front walls of Buildings 9A and 19 cannot be higher than the wings of Building 1.
- Building heights may be permitted to be higher than the wings of Building 1 provided that their front walls are set back to minimize visibility from within the site.
- The overall heights of Buildings 9A and 19 are to be the same.

New construction should respect, and enhance where possible, the historical importance of the other buildings and courtyards on the site. These design guidelines, though not formulated for Building C and the underground parking garage, nonetheless give an indication of the parameters required to protect the setting and integrity of Building 1.

The new 5-story Building C would replace five non-historic interconnected buildings spread out over a large site to the rear of the Central Tower Block. These building are not visible from the front of the Tower Block or the Front Lawn. The visual effect upon the historic setting of Building 1 is speculative until the new building undergoes conceptual design or is at least represented by a block diagram and a generic site plan. However, a design parameter has been set that would be generally consistent with the height of the tallest building to be demolished. The 573,000 SF construction should be able to be accommodated in a building that would not create a visual intrusion looming behind the Central Tower Block.

Building 1 includes a corridor-like extension to the rear or east that links it to Building 2. Although Building 2 has long been enveloped in other buildings and has no historic integrity, the rear extension of Building 1 is still unattached on its northern and southern elevations and frames two small courtyards to the north and south. These courtyards and the rear extension of Building 1 are vestigial elements of the axial and ramifying plan of the original hospital core. Although not the most prominent features of the Central Tower Block, they are historically significant. The design of the new hospital core would have to take into account their residual historic integrity.

Future design reviews by MHT and NCPC under their respective legal authorities would be intended to result in the avoidance and/or minimization of any potential adverse effects on the Central Tower Block or Buildings 3 and 5 as historic properties.

Parking Alternatives

- *Underground Parking* - Underground parking in the Front Lawn below Building 1 would not inherently have an adverse effect upon the Tower Block or the Front Lawn as historic properties. However, specific details such as the location and design of ingress and egress points for vehicles and pedestrians as well as outdoor lighting, signage, and air vents could have potential adverse effects. An underground ramp from the garage would lead directly into the level below the historic Art Deco lobby of Building 1 and its existing elevator bank. By funneling patients and visitors directly into the core of the Central Tower Block it would recall the *axial parti* of the original 1940s plan of the medical complex. There are two options under consideration for ingress/egress for vehicles:

    - G-Lot Parking Ingress/Egress - G-Lot is just outside the cone of the Front Lawn viewshed emanating from the entrance to the Tower Block. Under this option, vehicles would enter G-Lot and access the garage via descending ramps underneath North Wood Road. The ingress/egress would be close to, but would not interfere with, the temporary medical facilities. There would be no permanent surface disruption within the Front Lawn under this option; therefore, it would have no adverse effect on cultural resources.

    - Wood Road at the Building 1 Entrance Ingress/Egress - This option places ingress and egress points within the current limits of Wood Road at symmetrical locations flanking the Building 1 terraces. The stretch of road below the entrance would remain unencumbered by traffic and reinvigorate the use of the Tower Block's entrance as the historic "front door" of Bethesda.

    In addition to facilitating iconic views, the Front Lawn as a historic landscape has aspects of peacefulness in feeling and

association that would be important to preserve. If sensitively designed, in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, this option for access to the underground parking below the Front Lawn would have no adverse effect on historic properties.

- *Warehouse Area* - The warehouse area site for parking would accommodate up to a 6-story parking structure (although, depending on feasibility, some levels could be underground) and require the demolition of several small to medium size temporary shed structures. This site at the northeastern corner of the installation is well outside the Historic District and unlikely to be visible from its Flag Officers Row component. However, the 2009 ICRMP List of Pre 1963 Buildings and Structures Requiring NRHP DOEs (Table 5-1, NNMC, 2009) includes two buildings at the center if the site selected: 149 and 152. The Navy is currently preparing DOEs for these and other buildings at NSA Bethesda for which NRHP eligibility has not yet been formally determined. Preliminary indications are that the two buildings are ineligible; however, the determination process would require concurrence by MHT before being considered final.

- *H-Lot* - The H-Lot alternative site for parking would accommodate up to a 6-story parking structure and require no demolition. It is outside the Historic District and would not be visible from any of the remaining historic buildings within the district. Although the site is near the documented boundary of the Historic District, recent construction and demolition at NSA Bethesda have removed facilities contributing to the Historic District in this location. There would be no adverse impact on historic properties from placing a parking structure at this site.

- *Taylor Road Facilities* - The Taylor Road Facilities site would accommodate a 5-story garage. The garage would require the demolition of several small buildings, of which Buildings 59, 69, and 79 are post 1963 but the 2009 ICRMP indicates should be evaluated for NRHP eligibility. Prior to their demolition, NSA Bethesda would be required to submit DOEs for these buildings to the Maryland State Historic Preservation Officer (SHPO) and consult on the avoidance, minimization, or mitigation of the loss of any determined NRHP eligible. The garage would also be adjacent to the lawn, which provides a setting for the Flag Quarters and to Building 17, contributing buildings to the Historic District. However, at the limited scale anticipated, the garage would be remote enough from these historic buildings to have no adverse impacts.

Internal Renovations

To achieve a unified functional medical facility core, the interiors of Buildings 1, 3, 5, 9, and 10 would be renovated. As stated previously, Building 1 or the Central Tower Block is listed on the NRHP while Buildings 3 and 5 are contributing buildings to the Historic District. Nothing in the nomination of Building 1 to the NRHP or the documentation of Buildings 3 and 5 as contributing assigns any significance to the interior spaces of the buildings. In fact, the interiors appear to have been renovated and reconfigured several times as internal uses, plumbing, wiring, and the requirements of medical and information technology infrastructure have changed. The only interior space that retains its historic character is the grand multi-level Art Deco entrance hall of the Central Tower Block. If changes to this space are included in the project, consultation under Section 106 would be required. Otherwise, the interior renovations would have no adverse effect on historic properties.

Temporary Medical Facilities

G-Lot, the location of the temporary medical facilities is at the northwestern corner of the installation, across North Wood Road from the Front Lawn and outside the viewshed mapped as a contributing feature. Therefore, there would be no adverse impacts on cultural resources.

Utilities Upgrades

The cultural resources impacts of the utility upgrades would be as follows:

- Demolition and reconstruction of three existing cooling towers and construction of a fourth tower, replacement of deteriorating condensate return lines across campus. This project impacts Building 252 which is non-contributing to the Historic District and not on the 2009 ICRMP lists for further NRHP evaluation; therefore, this project would have no effect on cultural resources.

- Reparation of condensate lines, and provision of backup water supply storage for the installation. This project would have no effect on cultural resources.

- Upgrades to the capacity of the electrical distribution system. This project would have no effect on cultural resources.

Accessibility and Appearance Projects

The Front Lawn of Building 1 at NSA Bethesda remains the only landscape feature with NRHP eligible status; the existing

documentation addresses the value of the rolling terrain and landscape as a healing environment. Therefore, the projects in this section are generally in keeping with the feeling and association aspects of the historic appearance of the installation.

- *North Palmer Road*. As this project includes improvements to existing pedestrian infrastructure and landscaping around historic Building 11 and adjacent to the Central Tower Block, design sensitivity must be exercised with the details of this project. An example would be handrails or ramps, the design of which must be sympathetic to the historic resources. Review of the detailed design drawings by MHT and NCPC would be sufficient to avoid adverse effects to Building 1, the Front Lawn, and Building 11, as NRHP resources.

- *Courtyard*. Landscape improvements along Brown Drive would be within the Historic District but not adjacent to any of its contributing buildings or the Front Lawn. It would have no effect on NRHP historic resources.

- *Memorial Grove*. Landscape improvements along South Palmer Road between Wood Road and Brown Drive would be within the Historic District but not adjacent to any of its contributing buildings. It would have no effect on NRHP historic resources.

- *Building 17 Connector*. As this project includes improvements to existing pedestrian infrastructure and landscaping around the historic Building 17 and adjacent to the historic Flag Quarters, design sensitivity must be exercised with the details of this project. An example would be handrails or ramps, the design of which must be sympathetic to the historic resources. Review of the eventual design drawings by the Maryland SHPO and NCPC would be sufficient to avoid adverse effects on Building 17 and the Flag Quarters, as NRHP resources.

- *University Entry*. The project would have no effect on NRHP historic resources as it involves adding flowering azalea plants along the section of University Road near the pond to improve the appearance of the area.

- *Stoney Creek Trail System*. This project is an improvement to an existing trail system that lies outside the Historic District. It would have no effect on NRHP historic structures or buildings. (See below for discussion on archaeology.)

Archaeology - All projects for the Medical Facilities Development would be constructed in the previously developed, low probability portions of NSA Bethesda, except for the Stoney Creek Trail System improvements. Further archaeological investigations may be required once the bridge footprints and ground disturbance potential of the

project has been identified. The appropriate course of action to achieve compliance with the NHPA and other relevant cultural resource laws would be determined and implemented by the Navy, following consultation with the MHT.

Standard operating procedures for consultation with the Maryland SHPO would be followed as detailed in the 2009 ICRMP, such as Procedure 8 *Emergency Procedures for Unexpected Discovery of Archaeological Deposits* where, upon discovery of an archaeological deposit, all work must stop and all reasonable efforts be made to avoid, minimize, or mitigate any adverse effects while contacting the cultural resources manager. In turn, the cultural resources manager would pursue further options in coordination with appropriate agencies.

Renovation of Building 13 (Internal and External)

Building 13, designed by Paul Cret and constructed in 1941, served as a laundry and garage for the hospital complex and is a contributing element of NSA Bethesda's Historic District. Interior features associated with the original use of the building have long been removed. However, although some of the entrances have been bricked in, the building's simple Art Moderne style exterior retains its essential character. As a part of the Medical Facilities Development, Building 13 would be renovated and its current use, a mixture of storage facility and administrative space, would become office space. It is anticipated that the design of the renovation would require certain changes to the exterior appearance of the building. The Navy would consult with MHT on the development of a design that would not negatively impact the remaining character defining features such as the fenestration, materials, rhythm of openings, and period details such as the entrance canopy. The Building 13 renovation would not have an adverse effect on cultural resources.

Construction Material Storage: The areas proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are previously disturbed, generally flat areas. Some impacts on the ground surface would occur as a result of construction staging on the sites, but they would be temporary and the areas restored to existing conditions once construction is complete. None of the areas fall within any known zone of archaeological sensitivity. The laydown area between the helipad and Navy Exchange is located within a NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.

4.8.2 Cultural Resources Impacts: University Expansion

Under either of the alternative sites, the University Expansion would occur outside the Historic District and would comprise an approximately 341,151 SF education and research building and an approximately 144,000 SF parking structure for 400 parking spaces. The USU complex was built between 1978 and 1980 and is not itself eligible

for the NRHP. It is located in the southeast corner of NSA Bethesda and is remote from the Center Tower Block and Front Lawn. No existing building or structure would have to be demolished for either alternative (see Figure 3-18).

University Expansion – Alternative 1

The Alternative 1 site is located in the forested lot east of Grier Road and south of the University campus. This alternative would require clearing of the forested area.

As indicated in Section 3.8, Cultural Resources Existing Environment, a Phase I archaeological investigation of this area was carried out in 2007 and, although several prehistoric sites were identified, MHT determined that none was found to warrant further study and they were determined not to be eligible for the NRHP (see Section 3.8.4)(NNMC, 2009).

The areas proposed for temporary construction material storage (ball fields, N-lot during 2013-2015, and the area between the helipad and the Navy Exchange) are previously disturbed, generally flat areas. Some impacts on the ground surface would occur as a result of construction staging on the sites, but they would be temporary and the areas restored to existing conditions once construction is complete. None of the areas fall within any known zone of archaeological sensitivity. The laydown area between the helipad and Navy Exchange is located within a NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.

There would be no impacts on cultural resources from the construction of the University Expansion at this site.

University Expansion – Alternative 2

This alternative is located in the parking lot between the University and the AFRRI. This alternative would offer the potential for fostering a continuous campus feel between the two tenants and a direct connection to the AFRRI buildings, where shared laboratories are located. The AFRRI complex has been recently determined eligible for the NRHP under Criterion A for its history of contributions to medical radiobiology and Criteria C for the unique design of the TRIGA Mark F "pulsing" reactor housed within. A DOE for AFRRI submitted by the Navy was concurred to by MHT in January 2012 (see Section 3.8.3.2). However, it was also determined that AFRRI does not share the Art Deco style or the period of significance of the Historic District and lacks exterior architectural importance. Impacts from temporary construction material storage would be the same as those for Alternative 1. Therefore, the construction of the University Expansion in this location would have no adverse impact on the integrity of AFRRI as a historic property or on any other cultural resource.

4.8.3 Cultural Resources Impacts: No Action Alternative

Under the No Action Alternative, no construction or renovation would occur, and there would be no impacts on cultural resources.

4.9 Land Use and Zoning Consequences

This section discusses the environmental consequences of the proposed actions to the area land use plans, local zoning, and aesthetics and visual resources in and around NSA Bethesda.

4.9.1 Land Use Impacts: Medical Facilities Development

The demolition, construction, and renovation of the Medical Facilities Development would occur entirely within the medical functional zone of NSA Bethesda. The proposed location for the temporary medical facilities is within the G-Lot, which is an existing surface parking lot. The renovation of Building 13 would occur within the maintenance functional zone of NSA Bethesda and the proposed uses of this facility, for the public works administration and security services, would be compatible with this zone.

The Medical Facilities Development has four alternative sites for a parking structure: an underground site located directly east of Building 1 and three above-ground sites at Taylor Road Facilities, H-Lot, and the warehouse area. These alternative sites are located in the administration, community service, and maintenance functional areas, respectively.

The utility upgrades include condensate lines, electrical capacity, the backup water supply system, and demolition and reconstruction of three cooling towers and construction of a fourth one. These upgrades would occur in various functional zones throughout NSA Bethesda.

4.9.1.1 Installation Land Use Impacts: Medical Facilities Development

The siting of the Medical Facilities Development would be consistent with land use on the installation and would be in proximity to the existing medical facilities. Additionally, these facilities were sited using criteria discussed in details in Section 2.2 of this EIS.

Building C Construction/Demolition and Internal Renovations

The proposed demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C and the internal renovations within Buildings 1, 3, 5, 9, and 10 would be located within the medical functional zone and therefore, would be of compatible land use. The core connector of the Medical Facilities Development, by connecting the outpatient and inpatient buildings, would aid the 2011 NSA Bethesda Accessibility Plan’s goal of establishing a connection between campus facilities and creating a space that makes it easier to wayfind within WRNMMC as well as making the campus more walkable. Also, by limiting development of these facilities to within the

existing medical zone, the Medical Facilities Development meets growth recommendations stated in the 2012 NSA Bethesda Master Plan.

Parking Alternatives

- *Underground Parking* – The 500-space underground parking garage would be located under the Front Lawn of Building 1. The garage would be located underground and the area would be converted back to lawn once construction is completed; therefore, no long-term impacts on land use are anticipated. This alternative is consistent with the 2012 NSA Bethesda Master Plan.

- *Taylor Road Facilities* - This parking structure would be located directly northeast of the current location of the administrative buildings. This structure would be between 3 and 5 stories with up to 500 parking spaces. The parking structure would be compatible with the administration zone; therefore, impacts on land use are not anticipated. This alternative is consistent with the 2012 NSA Bethesda Master Plan.

- *H-Lot Site* – This parking structure would be located directly east of the current location of the CDC in the current H-Lot, a surface parking lot. This structure is proposed to be up to 6 stories and would be consistent with the adjacent Navy Lodge height. The parking structure would be compatible with the community services zone because it would be replacing an existing surface parking; therefore, impacts on land use are not anticipated. This alternative is consistent with the 2012 NSA Bethesda Master Plan.

- *Warehouse Area Site* - This parking structure would be located in the northeastern portion of NSA Bethesda where there are existing warehouse structures. This would to be up to 6 stories with the potential for some levels to be moved underground. The parking structure would be compatible with the maintenance zone; therefore, impacts on land use are not anticipated. This alternative is consistent with the 2012 NSA Bethesda Master Plan.

Medical Facilities Internal Renovations

Internal renovations would occur in already existing buildings on NSA Bethesda and the renovations would not change the use of the buildings; therefore, impacts on land use are not anticipated.

Temporary Medical Facilities

The temporary medical facilities would be located in G-Lot during the construction project. This would not a permanent land use change, and

given the proximity of the parking lot to the medical functional zone, it would not represent a significant change in land use patterns at the installation; therefore, impacts on land use are not anticipated.

Utilities Upgrades

The utilities upgrades, including the replacement of condensate lines, electrical capacity upgrades, and the supply water tanks would be underground and the related construction activities would be temporary. Therefore, impacts on land use are not anticipated from those utilities upgrades. The replacement and construction of the cooling towers would occur in an area with facilities of similar functions; therefore, impacts on land use are not anticipated from these upgrades. This action is consistent with the 2012 NSA Bethesda Master Plan.

Accessibility and Appearance Improvements

This component of the Medical Facilities Development would meet the 2011 NSA Bethesda Accessibility Plan's goals of establishing accessible connections between campus facilities and creating a unified campus through pedestrian-friendly elements and techniques that provide greater accessibility and safety. The improvements would be similar to other landscaping and pathways on the campus and would enhance accessibility around NSA Bethesda; therefore, beneficial impacts on land use are anticipated. This action is consistent with the 2012 NSA Bethesda Master Plan.

Building 13 Renovations

Renovations to this building would occur in an already existing building on NSA Bethesda and the renovations would not cause the use of the building to conflict with the functional zone of the area; therefore, impacts on land use are not anticipated.

Construction Material Storage

Temporary construction material storage would occur in areas on NSA Bethesda that are already disturbed and would not cause conflict with the functional zone of the area; therefore, impacts on land use are not anticipated.

4.9.1.2 Land Use Impacts on Local Community: Medical Facilities Development

The Medical Facilities Development would occur entirely within the boundaries of NSA Bethesda. As a result, the proposed action would not alter, and therefore, would have no direct impacts on land use in areas adjacent to NSA Bethesda.

The Medical Facilities Development complies with several policies outlined in the NCPC Comprehensive Plan for an NCR Federal workplace,

environment, and transportation elements (NCPC, 2004). Specifically, the Medical Facilities Development is in compliance with policies as it:

- proposes to construct new structures on land that is already disturbed;
- is located in an area that that allows Federal employees to locate near other Federal agencies and departments with which they regularly interact such as USU and NIH;
- considers the modernization, repair, and rehabilitation of existing Federally owned facilities for Federal workplaces before developing new facilities;
- utilizes available Federally owned land or space before purchasing or leasing additional land or building space; and
- locates Federal facilities within walking distance of existing or fixed guideway transit services such as the Metro station at the NIH.

As discussed in Section 4.7, Transportation and Traffic Consequences, there would be minimal impacts on traffic from the proposed Medical Facilities Development and NSA Bethesda would therefore meet the Bethesda-Chevy Chase Master Plan's goal of ensuring that employment growth at NSA Bethesda be balanced with the transportation capacity of the area. The Bethesda-Chevy Chase Master Plan also recommends locating new employment in existing centers near Metro stations. The Medical Facilities Development accommodates this recommendation as the proposed action would occur near the Medical Center Metro station.

4.9.1.3 Aesthetics and Visual Resources: Medical Facilities Development

Aesthetic and visual impacts are considered to be significant if one or more of the following criteria are met:

- Changes at the site, including changes to form, line, color, and/or texture substantially degrade an existing viewshed or alter the character of a viewshed by introduction of anomalous structures or elements.
- Changes at the site would result in changes in the expectations of viewers (measured against the relative importance of those views) and result in a negative impression of the viewshed. The emphasis of this criterion is on views from public view areas.

Building C Construction and Demolition

Demolition of Buildings 2, 4, 6, 7, and 8 and construction of Building C would not alter the visual character of the area. The overall functionality of the buildings would not be changed and the landscape would remain largely unaltered as the new developments would be contained within the footprint of the demolished buildings. Although the new building would be slightly visible from behind the Building 1

Tower, aesthetic changes to the building style and character would be minimized by adhering to the 2010 IAP and requirements under NHPA in the design and construction of Building C. The viewer's sensitivity to the visual changes resulting from these proposed actions would be unlikely as the visual character would remain the same. In addition, the proposed actions would not impact any significant viewsheds because this area is surrounded by other buildings and not highly visible from outside the immediate vicinity or from off-campus.

Parking Alternatives

- Underground Parking - The construction of an underground parking garage would have short-term impacts on the views of the Front Lawn from Rockville Pike looking towards the Building 1 Tower with the duration of approximately 3 years. As a result of open excavation construction, large areas of lawn would be removed and construction vehicles and equipment would be highly visible throughout the duration of construction. Visitor sensitivity to these temporary impacts would be high as this is a prominent and highly visible location on campus. However, these impacts would only last during the construction duration. Upon completion, the Front Lawn and the views associated with the Building 1 Tower would be restored.
- Taylor Road Facilities - The parking garage at the Taylor Road Facilities would not be anticipated to notably change the aesthetic viewshed. The site is currently occupied by Buildings 28, 53, and 59. Therefore, the replacement of these buildings with a parking garage would not alter the highly developed setting. In addition, the parking garage would be constructed in a style that would be visually compatible with adjacent buildings. The garage would also be adjacent to the lawn, which provides a setting for the Flag Quarters and to Building 17, contributing buildings to the Historic District. However, at the limited scale anticipated, the garage would be remote enough from these historic buildings to have no adverse impacts.
- H-Lot Site - The construction of up to a 6-story parking garage in the area currently identified as H-Lot would add an additional vertical element to the landscape. The viewers' sensitivity to this visual change would be notable, especially for those who reside in the neighboring communities to the south. However, the garage would be visually compatible with existing structures in proximity as per the 2010 IAP. In addition, the fence and tree buffers would remain. There are also no significant viewsheds in the area that would be impacted.
- Warehouse Area - The construction of an above-ground parking garage in the northeast corner of the installation would be visible from adjacent locations. The parking garage would be up to 6 stories, and depending on the feasibility, some levels of the structure could be underground. However, the parking garage would be located more than 200 feet from the fence line and would

not notably alter the visual character of the location, as the overall functionality of the area would remain the same and the tree and fence buffers between the proposed site and the adjacent residential areas would remain. However, viewer sensitivity to any visual changes would be likely, especially for those who reside in the residential houses adjacent to the northern fence line.

Medical Facilities Internal Renovations

The proposed renovations in Buildings 1, 3, 5, 9, and 10 would be in areas internal to the building; therefore, there would be no impacts on aesthetic and visual resources.

Temporary Medical Facilities

The temporary medical facilities in the area in the current G-Lot would temporarily alter the visual character of the site. The temporary buildings would be visible from vantage points around campus and from off-campus such as from the Stone Ridge School to the north. Viewers' sensitivity to these visual changes would be likely, especially for those working or attending school at the adjacent school. However, any visual alterations would be temporary and would be eliminated with the removal of the temporary medical facilities.

Utilities Upgrades

The majority of the utilities upgrades including the replacement of condensate lines, electrical capacity upgrades, and the supply water tanks would be underground and construction activities would be temporary. Therefore, impacts on aesthetic and visual resources are not anticipated from any of the utilities upgrades. The replacement and construction of the cooling towers would occur in areas with facilities of similar functions; therefore, impacts on aesthetic and visual resources are not anticipated.

Accessibility and Appearance Improvement Projects

The accessibility and appearance projects recommended in the 2011 NSA Bethesda Accessibility Plan mostly involve improvements to existing infrastructure including widening/realigning sidewalks, installing directional indicators and guides, and additional landscaping. All of the proposed accessibility and appearance improvements would be anticipated to enhance the aesthetics of the project area. These changes would not alter the viewshed and would improve the viewers' interactions with the landscape by providing directional guides and upgraded walkways resulting in long-term beneficial impacts on aesthetics and visual resources.

Building 13 Renovation

Both internal and external renovations would occur to Building 13. Renovations to internal areas of the building would have no impact on aesthetic and visual resources. Renovations to the exterior of the building include replacing garage doors, trimming the current loading dock, adding a doorway on the upper floor, and adding some windows. These renovations would be completed in such a way that the historic integrity of the building would be maintained; therefore, these renovations would have limited to no impact on aesthetic or visual resources.

Construction Material Storage

Temporary construction material storage would occur in areas on NSA Bethesda that are already disturbed. There would be a temporary alteration to the existing viewshed due to the placement of construction materials on areas that are currently open and not occupied. The laydown area between the helipad and Navy Exchange is located within a NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.

4.9.2 Land Use Impacts: University Expansion

4.9.2.1 Installation Land Use Impacts: University Expansion

Both Alternatives 1 and 2 are within the educational functional zone of the campus and the prescribed area for USU development as described in the 2012 NSA Bethesda Master Plan.

University Expansion - Alternative 1

This site provides a location where employees would be near the existing USU buildings and AFRRI. This alternative would impact up to 4.2 acres of forested area and trails at the installation (NAVFAC, 2011c). However, NSA Bethesda manages its forestry resources to minimize the loss of forest resources during land development by making identification and protection of forests and other sensitive areas an integral part of the site planning process and would ensure that the removal of the forested area would be minimized to the extent possible during the design.

Temporary construction material storage would occur in areas on NSA Bethesda that are already disturbed and would not cause conflict with the functional zone of the area; therefore, impacts on land use are not anticipated.

University Expansion - Alternative 2

Alternative 2 would comply with several objectives of the 2008 NNMC Master Plan Update. This alternative is located in the parking lot between the USU campus and AFRRI; therefore, it would offer the

potential for fostering a continuous campus feel between the two tenants and a direct connection to the AFRRI buildings, where shared laboratories are located. This alternative would be located in an area with mostly already disturbed land. Alternative 2 would impact approximately 1.7 acres of landscaped areas and 0.3 acre of forested areas. This location is in an area with multiple pedestrian and vehicle linkages and would enhance the walkable nature of the campus. However, because of area limitations, constructing on this site may require that the parking structure be constructed under the University Expansion.

Temporary construction material storage would occur in areas on NSA Bethesda that are already disturbed and would not cause conflict with the functional zone of the area; therefore, impacts on land use are not anticipated.

University Expansion – Internal Renovations

Internal renovations would occur in already existing buildings on NSA Bethesda and the renovations would not change the use of the buildings; therefore, impacts on land use are not anticipated.

4.9.2.2 Land Use Impacts on Local Community: University Expansion

Construction of the University Expansion and parking structure would occur entirely within the boundaries of NSA Bethesda. As a result, either of the University Expansion alternatives would neither alter nor impact land use in areas adjacent to NSA Bethesda.

The Bethesda-Chevy Chase Master Plan states that any future expansion at NSA Bethesda should be accompanied by a traffic study. This EIS includes a Traffic Study (Appendix D); thereby, complying with the request of this plan (B-CC Master Plan 1990). Additionally, as discussed in Section 4.7, Transportation and Traffic Consequences, there would be minimal impacts on traffic from the proposed University Expansion; therefore, it would meet the Bethesda-Chevy Chase Master Plan’s goal of ensuring that employment growth at NSA Bethesda be balanced with the transportation capacity of the area. The Bethesda-Chevy Chase Master Plan also recommends locating new employment in existing centers near Metro stations. The University Expansion accommodates this recommendation as the proposed action would occur near the Medical Center Metro station.

Neither alternative would be consistent with NCPC’s policy of discouraging development in areas of high erosion potential or on slopes with a gradient of 15 percent and above as both sites are located, to some degree, on highly erodible soils or on slopes with gradients greater than 15 percent (NCPC, 2004; NNMC, 2000). However, BMPs would be employed to address the high erosion potential at either of the locations. Otherwise, both alternatives are in compliance with several NCPC policies as both sites (NCPC, 2004):

- utilize available Federally-owned land or space before purchasing or leasing additional land or building space; and
- are located at Federal facilities within walking distance of existing or fixed guideway transit services such as the Metro station at NIH.

University Expansion - Alternative 1

This alternative would require removal of forested area at the installation, resulting in loss of green space in a highly developed area such as Bethesda. However, NSA Bethesda values the mature landscape of the campus as one of its most positive attributes. The mature trees and plant materials provide a park-like, unifying feature and are a pleasing contrast to the increasingly urban character of the area. To ensure that these characteristics are enduring, the proposed projects at NSA Bethesda would adhere to the design guidelines in the 2010 IAP. The landscape design guidelines include maintaining a landscaped buffer at the southern, eastern, and northern perimeters in consideration of the residential and institutional neighbors and utilizing trails, pocket parks, and landscaping to contribute to a pleasant environment for patients and their families. Additionally, NSA Bethesda manages its forestry resources to minimize the loss of vegetation during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. This would ensure that the removal of the forested area would be minimized to the extent possible during the design.

University Expansion – Alternative 2

Alternative 2 would be in an area that is already mostly disturbed and therefore, would preserve the forested area in a highly urbanized area such as Bethesda. In addition, construction of the University Expansion on this site would meet NCPC’s goal of using previously developed sites for new construction.

University Expansion – Internal Renovations

The internal renovations of the USU Expansion comply with several policies outlined in the NCPC’s Comprehensive Plan for the NCR Federal workplace, environment, and transportation elements (NCPC, 2004). The internal renovations are in compliance with NCPC policies as these internal renovations consider the modernization, repair, and rehabilitation of existing Federally-owned facilities for Federal workplaces before developing new facilities. The renovation of these facilities meets several other guidelines identified in previous sections.

4.9.2.3 Aesthetic and Visual Resources: University Expansion

University Expansion – Alternative 1

Construction of the proposed University Expansion in the area south of the University would alter the visual character of the site from a naturalized woodland setting to a more developed setting. The proposed new structures and elements would have long-term impacts on the existing visual character. The proposed construction would add hardscaping and remove a majority of the trees and vegetation.

Temporary construction material storage would occur in areas on NSA Bethesda that are already disturbed. There would be a temporary alteration to the existing viewshed due to the placement of construction materials on areas that are currently open and not occupied. The laydown area between the helipad and Navy Exchange is located within a NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.

University Expansion – Alternative 2

The proposed construction of the University Expansion in the area west of the University would not be anticipated to notably change the visual character of the area. The proposed site is a developed area between the current University buildings and AFRRI. The construction of additional buildings would not alter the functionality or the landscape of the area. Although construction would remove some vegetation and add additional hardscape to the area, the buildings would be designed and constructed in a compatible manner to adjacent existing buildings, adhering to the IAP. Construction of the proposed buildings would not interfere with the significant viewsheds originating at the University Campus.

Temporary construction material storage would occur in areas on NSA Bethesda that are already disturbed. There would be a temporary alteration to the existing viewshed due to the placement of construction materials on areas that are currently open and not occupied. The laydown area between the helipad and Navy Exchange is located within a NRHP eligible district but impacts on views and visual quality, though minor and adverse, would be temporary.

University Expansion – Internal Renovations

The proposed renovations to the USU buildings would be in internal areas; therefore, there would be no impacts on aesthetic and visual resources.

4.9.3 Land Use Impacts: No Action Alternative

Under the No Action Alternative neither the Medical Facilities Development nor the University Expansion would be implemented; therefore, there would be no impacts on existing land uses on NSA

Bethesda or in the surrounding area or on aesthetic and visual resources.

4.10 Socioeconomics Consequences

Socioeconomic impacts associated with the Medical Facilities Development and the University Expansion are examined separately in the subsequent sections. Impacts from the project on the ROI's demographics, economy, housing, and quality of life are examined as well as impacts that could occur to public services such as law enforcement, fire and rescue, schools, and medical services. Environmental justice impacts and impacts on children are also addressed. Separate analyses were undertaken for the construction activity and the increased employment associated with the facility operation.

In order to analyze the effects of the proposed action on socioeconomic resources in the ROI, an economic forecasting model that evaluates the significance of the impact on the ROI was used. The model results associated with construction spending in the ROI were assessed for both direct effects, such as construction employment and salaries, and induced effects, or the effect of those salaries and associated spending on the ROI's economy.

Changes in local economic activity associated with the project are computed as the product of initial changes in sales volume and a local impact multiplier. In total, the model examines changes in economic indicators including sales volume, income, employment, and population in the ROI, estimating the direct and induced effects of the action. Appendix E discusses this methodology in more detail and presents the model input and output tables for this analysis.

The thresholds of significance for the economic variables are determined by the model and are based on actual historic deviations from the historic trends for extreme events. To determine the historical range of economic variation, the model calculates a rational threshold value (RTV) profile for the ROI. This analytical process uses historical data for the ROI and plots the average growth rate for the sales volume, income, employment, and population patterns as a trend over a 30-year period. This model then can identify and evaluate the historical annual extremes of these values over this 30-year period as a deviation from the average growth trend. These deviations are called historical extremes and the largest deviations during this 30-year period are the thresholds of significance (i.e., the RTVs) for social and economic change. If the estimated effect of an action falls above the positive RTV or below the negative RTV, the effect is considered to be significant.

Total construction dollars were input into the model for the year 2011; however, in reality, the construction expenditures would occur over a longer construction period. Therefore, the model outputs show the impact of the construction spending associated with the proposed

action if it were started and completed in 1 year. To better characterize the more gradual economic impacts, the impacts are also presented as average annual figures for the expected duration of the construction period, 2 and 5 years for the University Expansion and the Medical Facilities Development, respectively.

Impacts on socioeconomics were identified using the following model threshold criteria:

- **No Effects –** No change to socioeconomic conditions.
- **No Significant Effect** – A change that does not fall outside the historic range of ROI economic variation.
- **Significant Effect –** A change is considered significant if it falls outside the historical range of ROI economic variation.

The residential location of NSA Bethesda's employees and workforce, combined with their potential to migrate into the ROI as a result of the proposed actions, has a considerable effect on the magnitude of the socioeconomic impacts. The project's spending would support the employment of the construction workforce and NSA Bethesda employees that already live in the ROI, but there would be no new economic activity within the ROI. However, increases in the salaries and income of this workforce may provide slightly higher household spending in the ROI. The construction workforce and existing employees of NSA Bethesda who presently live outside the ROI and move to the ROI as a result of this project would provide new economic stimulus to the ROI, such as increasing household spending (induced effects), which would increase downstream jobs and income in the ROI. Construction workers who may relocate temporarily also would provide economic stimulus to the ROI's economy because they would spend a portion of their income on food, beverage, and possibly lodging in the ROI.

4.10.1 Socioeconomics Impacts: Medical Facilities Development

The Medical Facilities Development's construction would take place in three phases over a 5-year period from 2013 to 2018. As a result of the Medical Facilities Development, it is anticipated that an additional 50 people would be employed at the facility as support staff, and the addition of these staff would occur after completion of the construction period (Pers. Comm., Sadlon, 2011c). Impacts associated with the construction portion of this project are presented separately from impacts associated with changes in staff for operations of the facility. No in-migration to the ROI as a result of construction activities or the increase in support staff is expected to occur under this alternative. The reasoning behind this assumption is detailed below.

4.10.1.1 Economic Development and Employment: Medical Facilities Development

Construction Period Impacts

The construction sector is considerable in the ROI with employment of approximately 36,000 jobs, comprising 6 percent of total employment in 2009. Additionally, the greater Washington, Baltimore, and northern Virginia metropolitan area have a considerable construction workforce. With the recent economic downturn, the ROI lost 7,400 construction jobs between 2007 and 2009, a 17 percent decrease over this period (BEA, 2009). With the current economic conditions, along with the vast supply of labor in adjacent metropolitan areas, it is likely that the bulk of the construction workforce would be supplied from within the ROI or region. Therefore, none of the construction workers for Medical Facilities Development are assumed to move into the ROI. However, some specialized construction workers may relocate temporarily to the ROI, which would have beneficial effects on lodging and the food and beverage sectors, although these effects are expected to be relatively small.

Four distinct, separate construction economic impact scenarios are possible under the Medical Facilities Development. These scenarios differ depending on the location of the parking structure associated with Medical Facilities Development. The scenarios have been titled according to the location of these sites and are called:

- Underground parking
- Above-ground parking at the H-Lot site
- Above-ground parking at the warehouse area site
- Above-ground parking at the Taylor Road Facilities

Construction costs that are the same for each of these scenarios are:

- $508,700,000 for the demolition of existing buildings 2, 4, 6, 7, and 8, the internal renovations to buildings 1, 3, 5, 9, and 10, and the construction of Building C (NAVFAC, 2011d);
- $26,590,000 for construction of temporary medical facilities (NAVFAC, 2011p);
- $46,749,000 for utility upgrades and electrical capacity improvements (NAVFAC, 2011e, r, and s);
- $6,840,000 for minor improvements to pedestrian pathways and landscaping (NAVFAC, 2011f); and
- $3,910,000 for internal and external renovations to Building 13 (NAVFAC, 2012b).

Four separate parking structure costs exist depending on whether the parking structure is located underground or above-ground and whether demolition of existing buildings would be required in order to build the structure. Construction of an underground parking structure is

anticipated to cost approximately $36,673,000, while the cost associated with constructing an above-ground parking structure is anticipated to be approximately $24,762,650 (NAVFAC, 2011g and i). Each above-ground parking structure's proposed site must be cleared of structures or paved areas in order to put the parking structure in place. The costs for these demolitions are approximately:

- $57,350 for the H-Lot site (NAVFAC, 2011h);
- $96,687 for the warehouse area site (NAVFAC, 2011h and NAVFAC, 2011i); and
- $933,000 for the Taylor Road Facilities (NAVFAC, 2011h and NAVFAC, 2011j).

The total cost of the proposed right-sizing of WRNMMC is anticipated to be between $617,609,000 and $629,462,000 depending on the selection of the site for the parking structure. The economic impacts of these four scenarios are provided below and are also shown in Table 4-40 and Table 4-41.

The following model results are presented as a range of impacts that could occur under the four scenarios presented above and are estimated based on all impacts occurring within a 1 year time-period. In reality, the construction project is likely to occur over a 5 year duration. As a result, the following impacts are considerably higher than what is anticipated to occur during the construction period. This construction spending would generate sales of between $1,000,527,000 and $1,019,728,000 in 2011, which is an approximately 2 percent deviation in 2011 from the average rate of sales volume change over time in the ROI for each of the scenarios. Direct and induced income is estimated to be between $217,717,700 and $221,896,100, which is a less than 1 percent deviation from the average rate of income change over time in the ROI for each of the scenarios. There would be between 4,432 and 4,517 jobs supported by this project, which is a less than 1 percent deviation from the average rate of employment change over time in the ROI for each of the scenarios. None of the forecasted sales, income, or employment estimates for each of the scenarios has a deviation from the average rate of change greater than their respective historic extreme deviations. Therefore, consistent with the thresholds established through the model (described in Section 4.10), the anticipated economic changes in these indicators are expected to have no significant effect on the ROI's economy. See Table 4-39 for a detailed description of the economic impacts for each scenario.

Table 4-39: Economic Impacts of Construction Scenarios – Medical Facilities Development

Construction Scenario	Underground Parking	Above-Ground Parking at the H-Lot Site	Above-Ground Parking at the Warehouse Area Site	Above-Ground Parking at the Taylor Road Facilities
Construction Costs	$629,462,000	$617,609,000	$617,648,337	$618,484,650
Sales	$1,019,728,000	$1,000,527,000	$1,000,590,000	$1,001,945,000
Sales Deviation (%)	2.06	2.02	2.02	2.02
Income	$221,896,100	$217,717,700	$217,731,600	$218,026,400
Income Deviation (%)	0.66	0.65	0.65	0.65
Employment (jobs)	4,517	4,432	4,432	4,438
Employment Deviation (%)	0.83	0.82	0.82	0.82

As described previously, these changes were run through the model for a 1-year period. If the economic impacts are experienced on an average annual basis, which is a more realistic duration of impacts, over the 5-year construction period there would be between $200,105,400 and $203,945,600 in sales, $43,543,540 and $44,379,220 in total income, and 886 and 903 jobs depending on the scenario on an annual basis. According to the model results, between 338 and 345 of these jobs are anticipated to be construction-related jobs associated with this project, depending on the scenario, while the remaining jobs are associated with workers spending their money in the ROI. As described previously, the bulk of the construction jobs are anticipated to be filled with workforce from the ROI or the greater Washington DC area. See Table 4-40 below for a detailed description of the annualized economic impacts for each scenario.

Table 4-40: Economic Impacts of Construction Scenarios, Annualized

Construction Scenario	Underground Parking	Above-Ground Parking at the H-Lot Site	Above-Ground Parking at the Warehouse Area Site	Above-Ground Parking at the Taylor Road Facilities
Sales	$203,945,600	$200,105,400	$200,118,000	$200,389,000
Income	$44,379,220	$43,543,540	$43,546,320	$43,605,280
Jobs	903	886	886	888
Construction-Related Jobs	345	338	338	339

Operations Period Impacts

As the Medical Facilities Development is the right-sizing of existing facilities, an increase in the annual number of patients or visitors is not anticipated. A 50-person increase in support staff is expected and is anticipated to come from within the ROI. The staff is anticipated to have an average income of $58,724, which represents the average income of a healthcare worker in Montgomery County in 2009 (BEA, 2009). The anticipated increase in employment and salaries was used as an input to the model to estimate economic impacts for the operational component of this project.

The 50-person increase in support staff would support sales of approximately $6,185,046 in 2011, which is a negligible deviation in 2011 based on the average rate of sales volume change over time in the ROI. Direct and induced income at the place of work associated with this new employment is estimated to be approximately $3,768,389, which is a negligible deviation from the average rate of income change over time in the ROI. The 50 new jobs would support an additional 22 induced jobs, with total supported employment of 77, which is also a negligible deviation from the average rate of employment change over time in the ROI. None of the forecasted sales, income, or employment estimates has a deviation from the average rate of change greater than their respective historic extreme deviations. Therefore, consistent with the thresholds established through the model (described in Section 4.10, the anticipated economic changes in these indicators are expected to have no significant effect on the ROI's economy.

4.10.1.2 Impacts on Population: Medical Facilities Development

The bulk of the construction workforce for this alternative is expected to come entirely from within the ROI or the greater metropolitan area. It is possible that some specialized construction workers may have to temporarily relocate to the ROI to support the more technical aspects of the construction project. No relocation of off installation personnel is expected as a result of this alternative and the 50 new civilian support staff would be expected to come from within the ROI. The number of patients, visitors, and students would not change from existing levels because there would be no change in mission or function at WRNMMC. As a result, the impacts on the ROI's population resulting from Medical Facilities Development are expected to be minimal.

4.10.1.3 Impacts on Housing: Medical Facilities Development

Almost all of the construction workers and all of the facility support staff are anticipated to come from within the ROI or the greater metropolitan area. Some specialized workers may need to relocate to the area temporarily at various times during the period of construction. It is likely that these few workers who would temporarily relocate would either stay in hotels or rent an apartment short-term. There are a large number of hotels in the ROI and the greater Washington DC metropolitan area, and approximately 6,500

housing units were available for rent in the ROI in 2010. Therefore, impacts on the local housing supply are anticipated to be temporary and minimal.

4.10.1.4 Impacts on Public Services: Medical Facilities Development

As only minimal and temporary in-migration to the ROI is anticipated to occur during the construction period as a result of this alternative, no additional burden is expected on off installation public services. The requirement for fire, rescue, and police services on installation would also be minimal.

4.10.1.5 Impacts on Quality of Life: Medical Facilities Development

During the actual construction period, there would be increased traffic to the proposed construction sites. Over the period of site preparation, several trips could be generated to haul construction and demolition debris off the installation to the county transfer station. During construction, delivery trucks, trucks carrying heavy equipment and materials, and others would deliver necessary materials to the construction site. However, the impacts would be reduced by avoiding peak traffic hours to the extent practical.

Quality of life impacts could occur to those staff members who would have to temporarily relocate from buildings 2, 4, 6, 7, and 8 to temporary medical facilities in G-Lot. Although these facilities are expected to be equipped with the same equipment as the buildings from which the staff was previously located, the constraints of working in a modular building would still be present. Additionally, some minor outpatient procedures would take place in these temporary modular buildings.

Finally, the quality of life for both staff and patients in Buildings 1, 3, 5, 9, 10, and 13 may be impacted during these buildings' renovation period. However, the Navy would employ BMPs to ensure that there are minimal impacts on air quality, noise levels, detours, and other inconveniences within these buildings that could occur from renovation and construction activities.

4.10.1.6 Environmental Justice and Protection of Children: Medical Facilities Development

Environmental Justice

No environmental justice implications would be anticipated as a result of the Medical Facilities Development. There would be no disproportionately high and adverse environmental, human health, and socioeconomic impacts on low income or minority populations.

As noted in Section 3.10.3, the median household income in Montgomery County in 2010 was $89,155, which is considerably higher than that of the state ($68,854) and the nation ($50,046). In 2010, approximately 8 percent of the population in the county lived below the poverty

threshold, which is lower than the state and national figures of 9.9 percent and 15.3 percent, respectively. As described in Section 3.10.7, none of the tracts encompassing or surrounding NSA Bethesda have significantly high minority populations and none are identified as poverty or extreme poverty areas. Therefore, there would be no potential to impact an impoverished or minority area associated with this alternative.

Protection of Children

This alternative is not anticipated to disproportionately affect the health of children in the ROI. There may be some children living on the installation in Flag Housing or attending day care at the CDC. Flag Housing is located near the proposed construction sites for the Taylor Road Facilities parking garage and the warehouse area parking structure. The CDC is located near the proposed construction site for the H-Lot parking structure. Construction sites for the parking lots would be fenced to prevent unauthorized personnel from entering the areas and traffic speed limits would be implemented for construction traffic. As a result, there are not expected to be any adverse impacts on children living in Flag Housing or attending child care facilities on the installation.

4.10.2 Socioeconomic Impacts: University Expansion

In addition to discussing impacts that could occur as a result of the proposed University Expansion's construction, the consequences of permanently relocating several USU staff are discussed below. Approximately 220 staff that currently are dispersed in five offices located in the Rockville area in Montgomery County and visit the University on a daily or near daily basis would be permanently relocated to the institution. The construction of the University Expansion is anticipated to occur over a 2-year period from 2017 to 2018.

Economic Development and Employment

The total cost of the proposed expansion of the University Expansion is anticipated to be $252,800,000 (NAVFAC, 2011t, u, and v). Construction costs associated with this expansion are:

- $224,500,000 for construction of the University Education and Research Building (NAVFAC, 2011t);
- $14,260,000 for the University parking structure (NAVFAC, 2011u); and
- $14,040,000 for renovation and modernization costs for approximately 39,312 SF in Buildings A, B, and C as well as the ground floors of USU Health Sciences (NAVFAC, 2011v).

While it is expected that the Alternative 1 would have slightly higher construction costs than the Alternative 2 site due to the increased costs associated with stormwater mitigation, a loading dock, and site

excavation (Pers. Comm., Sadlon, 2011b), exact differences in cost are not yet available between the two site alternatives because the project is still in initial planning stages. Therefore, local employment, income and sales forecasts, and modeling data are the same for both sites. As described in Section 4.10.1, it is likely that the bulk of the construction workforce for this alternative would be supplied from within the ROI or the region. Therefore, none of the construction workforce for the University Expansion is assumed to move into the ROI. However, some construction workers may relocate temporarily to the ROI.

The following model results are estimated based on all impacts occurring within a 1 year time-period; in reality, construction is likely to occur over a longer duration of 2 years. As a result, the following impacts are considerably higher than what should be expected to occur annually during the construction period.

This alternative would generate sales of approximately $409,536,000 in 2011 and is a less than 1 percent deviation in 2011 from the average rate of sales volume change over time in the ROI. Direct and induced income is estimated to be approximately $89,116,310 and is a less than half of 1 percent deviation from the average rate of income change over time in the ROI. There would be 1,814 jobs supported by this project and is a less than half of 1 percent deviation from the average rate of employment change over time in the ROI. None of the forecasted sales, income, or employment estimates has a deviation from the average rate of change greater than their respective historic extreme deviations. Therefore, consistent with the thresholds established through the model (described in Section 4.10), the anticipated economic changes in these indicators are expected to have no significant effect on the ROI’s economy.

As described previously, these changes were run through the model for a 1-year period. If the economic impacts are experienced on an average annual basis, over the 2-year construction period there would be $204,768,000 in sales, $44,558,155 in total income, and 907 jobs supported by this project. According to the model results, approximately 346 of these jobs are anticipated to be construction-related jobs associated with this project, while the remaining jobs are associated with workers spending their money in the ROI. As described previously, the bulk of the construction jobs are anticipated to be filled with workforce from the ROI or the greater Washington DC area.

4.10.2.1 Impacts on Population: University Expansion

The 220 staff that would move their permanent offices to NSA Bethesda already work and likely reside within the ROI and are not expected to relocate residences as a result of this alternative. The number of patients, visitors, and students would not change from existing levels because there would be no change in the mission or function at USU. All other impacts on population associated with the University

Expansion are similar to those impacts addressed under the Medical Facilities Development above in Section 4.10.1. As a result, the impacts on the ROI's population resulting from the University Expansion are expected to be minimal. Impacts on Housing: University Expansion

Socioeconomic impacts on housing associated with the University Expansion are similar to those impacts addressed under the Medical Facilities Development in Section 4.10.1.

4.10.2.2 Impacts on Public Services: University Expansion

Socioeconomic impacts on public services associated with the University Expansion are similar to those impacts addressed under the Medical Facilities Development in Section 4.10.1.

4.10.2.3 Impacts on Quality of Life: University Expansion

Implications for quality of life both on and off NSA Bethesda as a result of construction traffic are similar to those found under the Medical Facilities Development in Section 4.10.1. However, construction traffic for this action is expected to last for only 2 years.

As discussed in Section 4.7, Transportation and Traffic Consequences, the traffic generated by the relocation of approximately 220 staff's permanent offices to the USU campus would have minimal impacts.

During the construction period, the quality of life in the work environment could be impacted for those staff at AFRRI, located east of the USU campus, that have offices within proximity to construction activities. However, it is anticipated that construction companies would employ BMPs to ensure that there are minimal impacts on air quality, noise levels, detours, and other inconveniences within these buildings that could occur from construction activities.

4.10.2.4 Environmental Justice and Protection of Children: University Expansion

There are not anticipated to be any environmental justice implications or a disproportionate effect on the health of children in the ROI as a result of this alternative; see Section 4.10.1 for more details.

4.10.3 Socioeconomics Impacts: No Action Alternative

The No Action Alternative would not be expected to create impacts or changes to the current socioeconomic characteristics at or surrounding NSA Bethesda. NSA Bethesda's population and employment would not be influenced, and no new construction would occur.

No Action Impacts Specific to the Medical Facilities Development

If the proposed investment is not approved, WRNMMC would not be provided with modern and improved "right-sized" facilities to better

accommodate current military space standards and the DoD health care mission. Additionally, the installation parking needs would not be addressed and the medical facilities would not be developed and upgraded. This could impact the quality of life on the installation and further constrain parking at the installation as well as new development that requires this "right-sized" parking. Furthermore, benefits to economic development, employment, and income from construction activity would not occur. Additionally, 50 support jobs would not be created at the installation.

No Action Impacts Specific to the University Expansion

If the proposed investment is not approved, the university would face accreditation challenges in the next LCME accreditation cycle. Operational costs would also continue to escalate due to an aging, inefficient, and dispersed infrastructure. University staff with permanent offices located off NSA Bethesda would continue to be geographically isolated from the main university campus. Ultimately, USU's capability to meet the full range of commitments to the Military Health System would be compromised. Furthermore, benefits to economic development, employment, and income associated with the construction activity would not occur.

4.11 Human Health and Safety Consequences

4.11.1 Human Health and Safety Impacts: Medical Facilities Development

4.11.1.1 Building C – Construction and Demolition

UST/AST: Demolition of Building 7 would require the removal of one UST and one daytank. The contents of these tanks would be removed prior to decommissioning and removing the tanks. Removing the tanks would be done in accordance with all Federal and state regulations. If there is any contamination discovered associated with these tanks, it would be remediated in accordance with Federal and state regulations. It is assumed that the new Building C would require two backup generators. Fuel tanks for the generators would be designed to meet the applicable Federal and state regulations for accidental spill prevention, detection, and containment; therefore, no impacts are anticipated.

Hazardous Materials and Wastes: The Medical Facilities Development would not increase the mission or function of WRNMMC; therefore, it is assumed that there would be no increase or change in the amount or type of hazardous materials used and hazardous waste generated, including radioactive material once the facilities become operational. Use in the new facilities of hazardous materials on the authorized user list would continue to be managed in compliance with applicable Federal and state regulations and in adherence to the WRNMMC Hazmat Program, which includes SOPs required for proper hazardous materials control and management. The production and management of hazardous waste in the new facility would continue to comply with applicable

Federal and state regulations. As a result, there would be no impact from hazardous materials and waste.

Buildings 2 (built in 1941), 4 (1941), 6 (1942), 7 (1963), and 8 (1963) were all built prior to the years that LBP (1978) and asbestos (1989) were regulated. These structures contain LBP and ACM. It is standard practice to check for LBP, ACM, and mold prior to demolition or renovation in any building, and NSA Bethesda has procedures in place to manage the substances, identify problem areas, protect and inform affected persons, remediate as necessary, and comply with applicable standards. This requires coordination between contractors, facilities management, environmental programs, Industrial Hygiene, Safety, and (medical) environmental health. NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations during demolition activities. Therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: Demolition of Buildings 2 and 8 would impact Solid Waste Management Unit (SWMU) 13 (Dental Laboratory Temporary Storage Area) and SWMU 14 (National Cancer Institute Temporary Storage Area), respectively. As a result of a RCRA Facility Investigation and documentation provided to USEPA, NSA Bethesda received No Further Action determinations for both SWMUs 13 and 14 (Pers. Comm., Sadlon, 2011e). Therefore, there would be no impacts.

Regulated Medical Waste: The Medical Facilities Development would not increase the mission or function of the facilities. Therefore, it is assumed that there would be no increase in the RMW once the facilities become operational and it would continue to be handled in accordance with all applicable Federal and state regulations and NSA Bethesda guidance. Therefore, no impacts are anticipated.

AT/FP: AT/FP considerations would be evaluated in the design of the new facilities and appropriate setback requirements in compliance with UFC antiterrorism standards (February 2012) would be met to the maximum extent possible. If existing constraints (density of buildings etc.) do not allow the standoff distances to be met, then additional blast protection measures, such as building hardening measures, would be incorporated into the building design. As a result there would be no impacts on human health and safety.

4.11.1.2 Medical Facilities Development Parking Alternatives

Under the parking garage alternatives, hazardous materials and wastes are discussed under each alternative only if the potential impacts differ from the other alternatives.

If the use of hazardous materials is required or hazardous waste is generated during the construction and operation of the parking structure under any alternative, those would be handled in compliance

with all the applicable Federal and state regulations; therefore, no impacts are anticipated.

Under any of the parking alternative, AT/FP considerations would be evaluated in the design of the new facilities, including the entry/egress options to ensure that minimum standoff distances from occupied buildings are met either through building separation or through other measures, to the greatest extent possible, such as building hardening measures to allow smaller standoff distances. As a result, no impacts are anticipated.

Underground Parking Garage Alternative

UST/AST: There are no USTs or ASTs in the vicinity of the proposed underground parking structure. It is assumed that a backup generator would be needed if a dewatering system is needed to remove groundwater seepage from the facility. Any fuel tanks required for the generator would be designed to meet the applicable Federal and state regulations for accidental spill prevention, detection, and containment; therefore, no impacts are anticipated.

Solid Waste Management Units and Areas of Concern: There are no SWMUs or AOCs in the vicinity of the proposed underground parking alternative.

Warehouse Area Parking Garage Alternative

UST/AST: Under the warehouse area parking alternative, demolition of Building 99 would require the removal of two USTs, one AST, and one oil/water separator. The contents of these tanks would be removed prior to decommissioning and removing the tanks. Removing the tanks would be done in accordance with all Federal and state regulations. It is not anticipated that the new parking structure would require any generators or fuel tanks, so no impacts are anticipated.

Hazardous Materials and Wastes: Building 149 (built in 1951) and Building 152 (built in 1951) would be demolished and would likely contain LBP and ACM. As discussed, NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations during demolition activities. Therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: Demolition and construction activities under the warehouse area parking alternative would occur in the area of four SWMUs. SWMU 4 (Pesticide Shop Former Temporary Storage Area) and SWMU 34 (Pesticide Handling and Mixing Building) are associated with Building 149, which is to be demolished. The Navy received No Further Action determinations for these two SWMUs; therefore, there would be no impacts (USEPA, 2012b).

Demolition and construction activities would also occur in the vicinity of SWMU 32 (Metal Storage Yard) and SWMU 33 (Million Dollar

Hill). These two sites are part of the Installation Restoration Program and require additional investigation. The Navy has developed approved preliminary work plans for these two sites (Pers. Comm., Sadlon, 2012c). Development in or around SWMUs or AOCs under the RCRA Corrective Action Permit (CAP) would occur only with concurrence from USEPA.

H-Lot Site Parking Garage Alternative

UST/AST: There are no USTs or ASTs in the vicinity of the proposed H-Lot parking garage and it is not anticipated that the new parking structure would require any generators or fuel tanks, so no impacts are anticipated.

Solid Waste Management Units and Areas of Concern: There are no SWMUs or AOCs in the vicinity of the proposed parking structure, so there would be no impact.

Taylor Road Facilities Parking Garage Alternative

UST/AST: Under the Taylor Road Facilities parking garage, demolition of Building 53 would require the removal of one UST and one AST. The contents of these tanks would be removed prior to decommissioning and removing the tanks. Removing the tanks would be done in accordance with all Federal and state regulations. It is not anticipated that the new parking structure would require any generators or fuel tanks, so no impacts are anticipated.

Hazardous Materials and Wastes: Based on the years that they were built, Buildings 28 (built in 1952), Building 53 (built in 1976), and Building 59 (built in 1989) may contain LBP and/or ACM. NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations during demolition activities. Therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: The Taylor Road Facilities parking garage would require the demolition of Building 53. AOC 2 now includes the Building 53 UST (formerly SWMU 31). It would also occur in the vicinity of SWMU 5 (Roadside Laboratory Waste Disposal). The Navy has received a No Further Action determination from USEPA for SWMU 5 (USEPA, 2012c). AOC 2 covers multiple sites, including the area at Taylor Road, and overall clean-up actions are ongoing. The Taylor Road area is finished and full close-out of AOC 2 is anticipated prior to ROD signature (Pers. Comm., Sadlon, 2012d). Development in or around SWMUs or AOCs under the RCRA CAP would occur only with concurrence from USEPA.

4.11.1.3 Medical Facilities Internal Renovations

UST/AST: No potential impacts because there are no fuel tanks in Buildings 1, 3, 5, 9, 10 and 13.

Hazardous Materials and Wastes: Buildings 1, 3, 5, 9, 10, and 13 contain LBP and/or ACM. As discussed, NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations during demolition activities. Therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: Internal renovations would not occur in the vicinity of any SWMUs or AOCs; therefore, there would be no impact.

AT/FP: The proposed action involves internal renovations to Buildings 1, 3, 5, 9, and 10; therefore, there would be no impacts. AT/FP considerations would be evaluated in the renovation design of Building 13. As a result there would be no impacts on human health and safety.

4.11.1.4 Temporary Medical Facilities

UST/AST: There are no USTs or ASTs in the vicinity of the proposed temporary medical facilities. If backup generators and associated fuel tanks are needed for the temporary facilities, the tanks would be designed and installed to meet the applicable Federal and state regulations for accidental spill prevention, detection, and containment; therefore, no impacts are anticipated.

Hazardous Materials and Wastes: *T*emporary medical facilities would house medical facilities while Building C is being constructed and would not anticipate an increase or change in the amount or type of hazardous materials used. Use in the temporary facilities of hazardous materials on the authorized user list would continue to be managed in compliance with applicable Federal and state regulations and in adherence to WRNMMC's Hazardous Materials Program. As a result, there would be no impacts.

Regulated Medical Waste: The temporary medical facilities would not increase in the amount of RMW that would be produced as a result of the Medical Facilities Development. RMW produced in the temporary medical facility would continue to be handled in accordance with all applicable Federal and state regulations and NSA Bethesda guidance. Therefore, no impacts are expected.

Solid Waste Management Units and Areas of Concern: The temporary medical facilities would not be located in an area near any SWMUs or AOCs, so there would be no impact.

AT/FP: The temporary medical facilities would be occupied for longer than 1 year so AT/FP standoff distances would be applicable. Impacts would be similar to the Building C with no impacts anticipated.

4.11.1.5 Building 13 Renovations

UST/AST: There are no fuel tanks in or adjacent to the Building 13.

Hazardous Materials and Wastes: Building 13 (built in 1941) contains LBP and/or ACM. As discussed, NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations during demolition activities. Therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: Internal and external renovations would not occur in the vicinity of any SWMUs or AOCs; therefore, there would be no impact.

AT/FP: AT/FP considerations would be evaluated in the renovation design of Building 13. As a result there would be no impacts on human health and safety.

4.11.1.6 Utilities Upgrades

UST/AST: There are no USTs or ASTs in the vicinity of the proposed utility upgrades.

Hazardous Materials and Wastes: Utility upgrades would include the demolition of Building 143 which was built in 1944 and contains LBP and ACM. The deteriorating condensate return lines to be replaced as part of the utility upgrades, if insulated, could also contain ACM. It is standard practice to check for LBP, ACM, and mold prior to demolition or renovation in any building, and NSA Bethesda has procedures in place to manage the substances, identify problem areas, protect and inform affected persons, remediate as necessary, and comply with applicable standards. This requires coordination between contractors, facilities management, environmental programs, Industrial Hygiene, Safety, and (medical) environmental health. NSA Bethesda would comply and ensure that its contractors comply with all applicable Federal and state regulations during demolition activities. Therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: Replacement of condensate lines would likely require construction activities in the vicinity of SWMUs 4, 5, 32, 33 and 34. As discussed above, the Navy has received No Further Action determinations for SWMUs 4, 5, and 34. The Navy has developed preliminary approved work plans for SWMUs 32 and 33. Any development in or around SWMUs or AOCs under the RCRA CAP would occur only with concurrence from USEPA.

AT/FP: No impacts on AT/FP are anticipated from the proposed utility upgrades.

4.11.1.7 Accessibility and Appearance Improvement

UST/AST: Of the accessibility and appearance improvement projects, the University Entry project would be the only project that would have an UST in the vicinity of the project area. UST (277a), a 1,000-gallon

diesel tank is located on the back side of Building 70A (USU). Improvements to the accessibility at the rear of the building would avoid impacting the tank; therefore, there would be no impacts on USTs or ASTs under this alternative.

Solid Waste Management Units and Areas of Concern: Portions of both the Building 17 Connector and the Stoney Creek Trail System improvements would occur in the area of SWMU 5 (Roadside Laboratory Waste Disposal), for which the Navy has received a No Further Action determination from USEPA. Development in or around SWMUs or AOCs under the RCRA CAP would occur only with concurrence from USEPA. As a result, there would be no significant impact provided USEPA concurrence for these sites is received.

AT/FP: The projects under this alternative involve widening/realigning walkways, installing directional indicators and guides, and landscaping for which AT/FP standards do not apply. Therefore, there would be no impacts.

4.11.2 Human Health and Safety Impacts: University Expansion

4.11.2.1 *University Expansion – Alternative 1*

UST/AST: Construction under this alternative would not occur in the vicinity of any existing USTs or ASTs, so there would be no impacts on existing fuel tanks. If the new facility requires a backup generator fuel tank for the generator, it would be designed and installed to meet the applicable Federal and state regulations for accidental spill prevention, detection, and containment; therefore, no impacts are anticipated.

Hazardous Materials and Wastes: While the new facilities to be constructed under this alternative would not increase the mission or function of the USU, it would consolidate dispersed departments, centers, and activities (some of which currently reside off campus) into one building. By moving facilities that currently reside off campus to facilities on campus it is anticipated that the authorized user list of the hazardous materials would grow and hazardous waste would increase. USU campus facilities currently produce approximately 1,200 pounds of hazardous waste per month. The approximate amount of regulated waste (both hazardous and medical combined) produced at the off-site locations is 500 pounds per month. Therefore, it is anticipated that the total amount of hazardous waste (not including medical waste) produced by USU under this alternative would be approximately 1,200 to 1,700 pounds. The increased amount of hazardous waste would be integrated into the existing management and disposal practices on campus complying with all applicable Federal and state regulations, and can be accommodated by the current disposal contractor. Therefore, significant impacts from the increase of hazardous materials and waste at NSA Bethesda are not anticipated.

Solid Waste Management Units and Areas of Concern: There are no SWMUs or AOCs in the vicinity of the proposed facilities under this alternative, so there would be no impact.

Regulated Medical Waste: Consolidating off-campus facilities to the new University Expansion facility on NSA Bethesda would increase the amount of RMW produced by the USU. Currently, USU campus facilities produce approximately 2,400 pounds of RMW, while off-site locations produce approximately 500 pounds of regulated waste (both hazardous and medical waste combined). Therefore, it is anticipated that the amount of RMW produced by USU under this alternative would be approximately 2,400 to 2,900 pounds. The increased amount of RMW produced under this alternative would be integrated into the existing management and disposal practices on campus compiling with all applicable Federal and state regulations, and could be accommodated by the current disposal contractor. Therefore, significant impacts from the increase of RMW at NSA Bethesda are not anticipated.

AT/FP: Under this alternative there is likely sufficient space south of South Palmer Road to adequately meet AT/FP standoff requirements. As with all new construction on NSA Bethesda, AT/FP considerations would be evaluated in the design of the new facilities and appropriate setback requirements in compliance with UFC antiterrorism standards would be met to the maximum extent possible.

4.11.2.2 University Expansion – Alternative 2

UST/AST: There are no existing fuel tanks in the vicinity of the Alternative 2 construction footprint, so impacts would be similar to Alternative 1, with no impacts anticipated

Hazardous Materials and Wastes: Impacts would be similar to those under University Expansion Alternative 1 and would not be significant

Solid Waste Management Units and Areas of Concern: There are no SWMUs or AOCs in the vicinity of the proposed facilities under this alternative, so there would be no impact.

Regulated Medical Waste: Impacts would be similar to those under University Expansion Alternative 1 and would not be significant.

AT/FP: Under this alternative, both the new facility as well as the parking structure would be located between Buildings 47 and 74. As with all new construction on NSA Bethesda, AT/FP considerations would be evaluated in the design of the new facilities to ensure compliance with the AT/FP standards to the greatest extent possible. Since the parking structure would be located under the new facility, special provision for parking below an occupied building would need to be provided for to meet AT/FP criteria so that there would be no impact on human health and safety.

4.11.2.3 University Expansion – Interior Renovation

UST/AST: USU Building A has two 50-gallon diesel fuel daytanks located within the building and one 1,000-gallon underground diesel fuel storage tank located on the northwest side of the building. USU Building B has one 50-gallon diesel fuel day tank located within the building and one 2,500-gallon diesel fuel underground tank located on the northwest side of the building. Interior renovations are not expected to impact these storage tanks. Therefore, no impacts involving underground or aboveground storage tanks are anticipated as a result of the interior renovations to USU (Buildings A, B, C and the ground floor).

Hazardous Materials and Wastes: Based on the year it was built, Buildings A (built in 1978) could contain LBP and/or ACM. As discussed, NSA Bethesda has procedures in place to manage LBP and ACM; therefore, impacts are not anticipated.

Solid Waste Management Units and Areas of Concern: One area of concern is located in Building D of USU (AOC 11) and one solid waste management unit is located in Building A of the USU (SWMU 22). Development in or around SWMUs or AOCs under the RCRA CAP would occur only with concurrence from USEPA. As a result, there would be no significant impact provided USEPA concurrence for these sites is received.

AT/FP: The proposed action involves internal renovations only; therefore, there would be no impacts.

4.11.3 Human Health and Safety Impacts: No Action Alternative

Under the No Action Alternative there would be no change to the condition or existence of USTs or ASTs, hazardous materials/wastes, and RMW generation. NSA Bethesda would continue to meets its obligations under the RCRA CAP and AF/FP according to the DoD standards. Therefore, impacts on human health and safety from the No Action Alternative are not anticipated.

4.12 Short-Term Use of the Environment versus Long-term Productivity

Regulations for the preparation of an EIS require that the relationship between short-term use of the environment and the maintenance and enhancement of long-term productivity be addressed. Implementation of either alternative would result in new development requiring various services, depending on the alternative chosen.

Long-term benefits under implementation of either of the alternatives would occur at the expense of short-term impacts in the vicinity of the project sites. These short-term impacts would occur during the period of construction for the alternative chosen.

4.12.1 Medical Facilities Development

Implementation of the Medical Facilities Development would require an estimated 6-year construction period in total for the various components. Demolition and construction for Building C and the parking garage (either underground or above-ground) would require the longest periods, with estimated time of four and three years, respectively. During the construction period, the following types of construction activities would occur: demolition, a combination of clearing and grubbing, excavating, surfacing, paving, erecting structures, and landscaping. Short-term impacts on the local noise, air quality, and natural resources, as well as possible traffic detours and delays, could occur at NSA Bethesda. If the underground parking location is selected, the construction activities on the Front Lawn could impair the viewshed of Building 1. However, these impacts would be temporary because the areas would be restored to original conditions after construction is completed. If the underground parking is selected with the ingress/egress option on Wood Road at the Building 1 Entrance, a sensitively designed entrance, in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties would ensure no adverse effect on historic properties.

Additionally, short-term gains to the local economy would occur if local workers are hired and if local businesses provide services and supplies during the construction of the Medical Facilities Development. Upon completion of the proposed action, the gains to the local economy would evolve into long-term benefits for the operation of NSA Bethesda and employee spending in the region.

Furthermore, completion of the proposed action would allow WRNMMC to fulfill the Congressional mandate to achieve the new statutory world-class standards for military medicine at WRNMMC and provide enduring facilities commensurate in quality, capability and condition as those provided by the BRAC investment. Therefore, the completion of the proposed action would result in long-term benefits for the Military Health System.

4.12.2 University Expansion

Implementation of the University Expansion would require an estimated 2-year construction period for Building F and the parking garage for either of the alternative sites. During the construction period, the following types of construction activities would occur: demolition, a combination of clearing and grubbing, excavating, surfacing, erecting structures, and landscaping. Short-term impacts on the local noise, air quality, and natural resources, as well as possible traffic detours and delays, could occur at NSA Bethesda. However, these impacts would be temporary and the implementation of proper controls would be utilized to prevent these effects from having significant impacts on the environment. There would be long-term impacts on the forested area under University Expansion Alternative 1 as 2.8 acres would be converted permanently to impervious area.

Additionally, short-term gains to the local economy would occur if local workers are hired and if local businesses provide services and supplies during the construction of the University Expansion. Upon completion of the proposed action, the gains to the local economy would evolve into long-term benefits for the operation of NSA Bethesda and employee spending in the region.

Furthermore, completion of the proposed action would address the space and operational limitations at USU and therefore, would result in long-term benefits for the Military Health System.

4.13 Irreversible and Irretrievable Commitment of Resources

Regulations for the preparation of an EIS require that irreversible and irretrievable commitments of resources associated with the proposed action be addressed. The construction of the Medical Facilities Development and the University Expansion would result in direct and indirect commitments of resources. In some cases, the resources committed would be recovered in a relatively short period of time. In other cases, resources would be irreversibly or irretrievably committed by virtue of being consumed or by the apparent limitlessness of the period of their commitment to a specific use. The provision of similar resources with substantially the same use or value can sometimes compensate for irreversible and irretrievable commitments of resources.

4.13.1 Medical Facilities Development

For Medical Facilities Development, up to 4.0 acres are estimated to be impervious surfaces, depending on alternative site selected for the parking garage alternative. However, it should be noted that most of 4.0 acres are currently developed sites that would be reused for the Medical Facilities Development. The remainder of the area would be landscaped. Resources consumed as a result of the Medical Facilities Development and any of the parking garage alternative would be offset by the creation of needed facilities and the resulting operational

benefits to NSA Bethesda. The use of the developed portion of the land would be considered irretrievably committed.

Biological resources that would be lost during development are minimal. The alternatives would also require the commitment of various construction materials, including cement, aggregate, steel, asphalt, lumber, and other building materials. However, much of the material dedicated to construction may be recycled at some future date. Additionally, the proposed Medical Facilities Development would require the use of fossil fuels, electrical energy, and other energy resources during the construction and operation of the facilities. These energy resources should be considered irretrievably committed to the project.

4.13.2 University Expansion

For University Expansion Alternative 1, up to 2.8 acres are estimated to be rendered impervious from a currently forested area. For University Expansion Alternative 2, up to 1.6 acres are estimated to be rendered impervious; however, most of the area would be located on currently developed site. Resources consumed as a result of either alternative would be offset by the creation of needed facilities and the resulting operational benefits to NSA Bethesda. The use of the land developed as part of the University Expansion could be considered irretrievably committed.

Biological resources could be lost during development of Alternative 1 because of the clearing of forested area. Either of the alternatives would also require the commitment of various construction materials, including cement, aggregate, steel, asphalt, lumber, and other building materials. However, much of the material dedicated to construction may be recycled at some future date. Additionally, either of alternatives would require the use of fossil fuels, electrical energy, and other energy resources during the construction and operation of the facilities. These energy resources should be considered irretrievably committed to the project.

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5.0 Cumulative Impacts

A cumulative impact is defined in the CEQ NEPA regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future action regardless of what agency (Federal or non-federal) or person undertakes such other actions" (see 40 CFR 1508.7). This section goes on to note that "such impacts can result from individually minor but collectively significant actions taking place over a period of time." Implementing the No Action Alternative would not involve any proposed actions on-site and therefore, would not result in additional cumulative impacts. The Medical Facilities Development and University Expansion would involve actions and therefore, would have the potential to add to cumulative impacts as a result of their impacts on the environmental resources examined in this EIS.

As discussed in Section 2.5, the Medical Facilities Development and University Expansion analyzed in this EIS are two components of the 2012 NSA Bethesda Master Plan that DoN is currently updating. The EIS analysis must include an evaluation of any incremental impacts from the proposed actions when added to actions from other internal ongoing and foreseeable future projects at NSA Bethesda including both short-term planned projects and long-term opportunities. Therefore, the EIS evaluates the cumulative impacts of the proposed actions in the context of the known, ongoing activities and identifies the potential programmatic impacts of the proposed actions in the context of potential future development opportunities. In addition, the EIS analyzes the cumulative impacts from the proposed actions when added to impacts from projects off installation that NSA Bethesda is not implementing, but are occurring during the timeframe of the proposed actions.

Time interval and physical distance between all of the actions considered are important in determining the potential for such interaction.

Ongoing Project

The cumulative impacts analysis considers one ongoing project at NSA Bethesda. The old Navy Exchange is being replaced by a new 2-story, 150,000 SF building with an adjacent 544-space garage. As discussed in Section 4.7, the 544 spaces of the new parking garage are considered part of the No Build future condition in the traffic impact analysis.

Short-Term Planned Projects

The 2012 NSA Bethesda Master Plan defines short-term planned projects as projects of known scope that address specific plans, goals, or

challenges in the near term. The short-term planned projects are as follows and are identified in Figure 5-1 (Numbers indicate the project location on Figure 5-1 and the projects start at Number 3 because in the 2012 NSA Bethesda Master Plan, the proposed actions Medical Facilities Development and University Expansion are projects numbers 1 and 2, respectively).

- **3 - Sanctuary Hall and Garage:** This project is the construction of a new WWTL (Sanctuary Hall), which would become Building 64. The building is planned to accommodate 100 two-bedroom hotel-style suites to house wounded warriors and their care-giving family members. Sanctuary Hall is proposed as a 139,285 SF facility to be built to LEED® Silver standards. A 5-story, 470-space parking garage would be provided as part of this project.

- **4 - Child Development Center**

  - 4A - New Child Development Center (CDC): A new 34,291 SF CDC for 300 children would be built near the existing daycare center (Building 26).

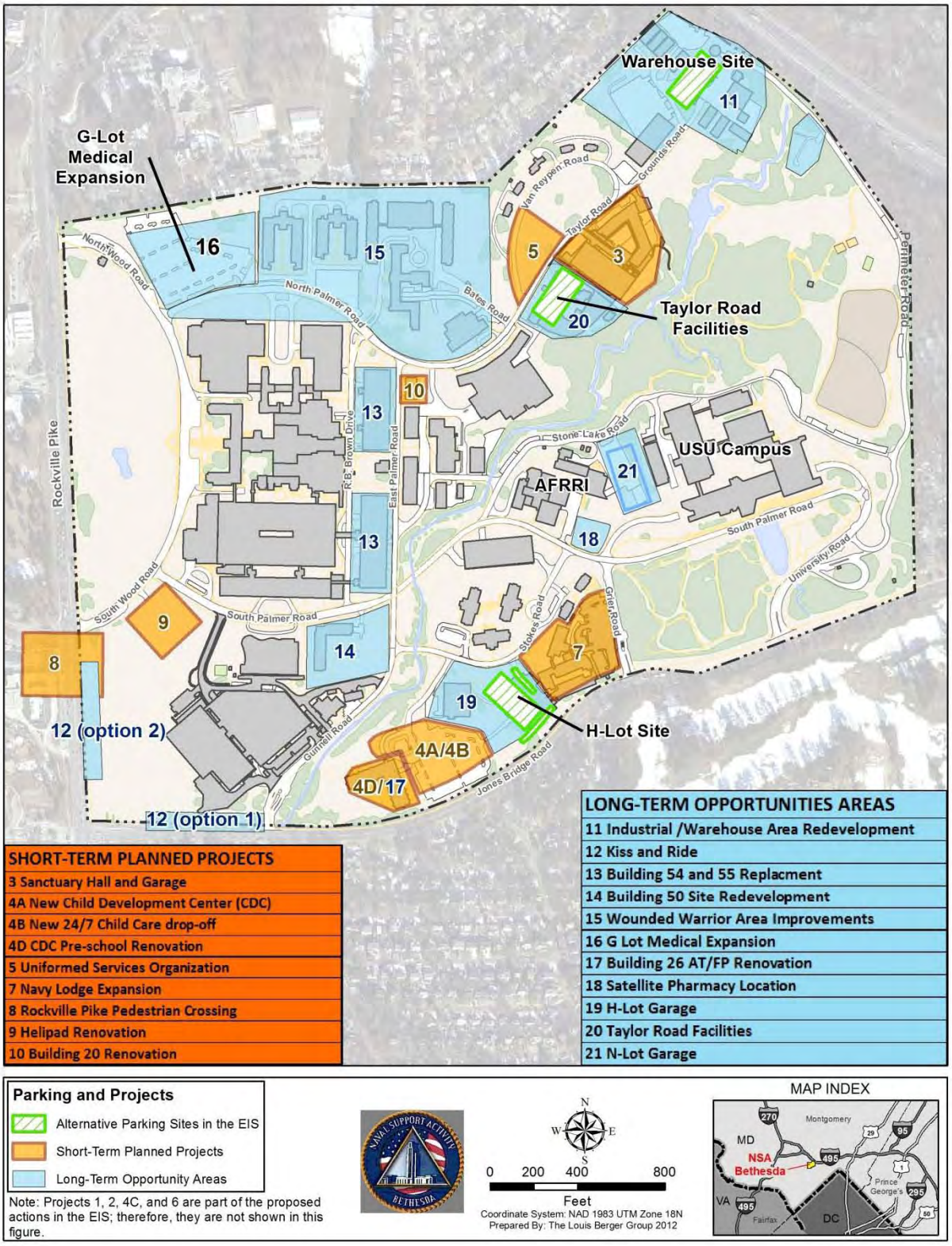
  - 4B - New 24/7 Child Care Drop-Off: A new 20-child 24/7 care residence would be built near the CDC. This 5,262 SF residential home structure would be able to accept children at any time of day or night.

  - 4C – Renovation of Hourly Drop-Off Center: The facility is currently located in Buildings 3 and 5, and the action would be addressed as part of the proposed Building C construction.

  - 4D - CDC Pre-school Renovation: Existing CDC renovation would address space issues in the current daycare center, adding space for a 24-child preschool room.

- **5 - United Services Organization (USO):** The USO building would be a destination for recreation and support for military personnel at NSA Bethesda. The building is expected to be 3 stories at its tallest section and up to approximately 20,700 SF located in the lawn in front of the Flag Housing area. Figure 5-1 shows the suggested location of the project; however, the final site is subject to change as the program is further refined.

Figure 5-1: Short-Term Planned Projects and Long-Term Opportunity Areas



- **7 - Navy Lodge Expansion:** An expansion of a new 7-story lodging structure, approximately 62,812 SF, is planned for construction adjacent to the existing 6-story Navy Lodge (Building 52). Supporting facilities include new surface parking to serve the lodge addition and improvements to the existing parking to meet current AT/FP standoff distances. The existing U-Lot, currently with 57 spaces, would be reconfigured to provide 95 spaces. Approximately 35 spaces within the adjacent H-Lot would be required to serve the lodge patrons. The existing stormwater pond would need to be improved to accommodate the increase in impervious area.

- **8 - Rockville Pike Crossing:** This project consists of a shallow pedestrian tunnel under Rockville Pike, connecting the east side of Rockville Pike at South Wood Road to the Medical Center Metro station on the west side of Rockville Pike. Designs also call for deep elevators on the east side of Rockville Pike that connect to the Metro Platform underneath. It should be noted that this project would be constructed by Montgomery County and is included in the 2012 NSA Bethesda Master Plan for coordination purposes only; MCDOT would be the action proponent for this project.

- **9 - Helipad Expansion:** The existing helipad would be reconfigured and expanded. The renovation would add 22,500 SF of bituminous pavement and require significant grading in order to level the new primary surface area. A new retaining wall would be required along South Palmer Road, and numerous trees would need to be removed to ensure that primary surfaces of the helipad are free of obstructions.

- **10 - Building 20 Renovation:** The existing fire station located in Building 20 is proposed for relocation and expansion because current facilities do not meet the station's needs and requirements. Renovation of Building 20 is proposed for community uses such as woodworking shops, commissary services, or indoor recreation and social opportunities.

Table 5-1 shows the estimated construction schedules for these projects.

Table 5-1: Estimated Construction Schedules for Short-Term Planned Projects

Project	Start	End
Sanctuary Hall (WWTL) - Garage	2012	2013
Sanctuary Hall (WWTL) - Building	2012	2014
Navy Lodge	2013	2015
USO	2012	2013[1]
CDC	2013	2014

Rockville Pike Crossing	2013	2015
Helipad	2014	2014
Building 20 Renovation	2012	2013
[1] Maximum 12-month construction, construction completion date pending start date. Source: Pers. Comm., Sadlon, 2011g and 2012b.		

Long-Term Opportunities Areas

The 2012 NSA Bethesda Master Plan also identifies the long-term opportunities areas, facilities, or strategies that are not currently planned, but which should be recognized as part of the larger installation improvement context. DoN would ensure the appropriate NEPA review for potential future development opportunities when the projects are proposed for implementation. Because these future development opportunities have yet to be proposed for implementation, there are no estimated timeframes for their construction activities and they likely would not occur within the time of the proposed actions. The long-term opportunity areas are listed as follows and are identified in Figure 5-1; however, these locations are preliminary and subject to change.

- **11 - Industrial/Warehouse Area Redevelopment and Fire Station:** A new consolidated 40,000 SF warehouse facility would allow for the consolidation of existing warehouse space and could accommodate the anticipated need for an additional 2,000 SF of future growth and provide space for storage relocated from Buildings 13 and 143. Approximately 25,000 SF of outdoor storage area could be located north in the former Z-Lot. This outdoor storage would need to be appropriately screened from the neighboring residential area and every attempt should be made to preserve existing vegetation at the edges of this area. Possible uses for this outdoor storage area are emergency services and security equipment storage, emergency vehicle storage, blood bank and other tenant special vehicle storage, and other typical maintenance uses. This area would replace the several smaller storage and laydown areas across the installation. Consolidation of the warehouse space would allow for the redevelopment of the area between Grounds Road and Stoney Creek as a hub for administrative functions, labs, and office space for tenants that do not need to be near the medical center to provide for patient care and educational services.

  The new Fire Station building is projected to be approximately 27,600 SF and a 2-story three company firehouse.

  A new parking garage may be built on the north side of Grounds Road and would provide parking for the administrative hub and general parking for the installation. The same parking garage location is also

analyzed in the EIS as an alternative site to the underground parking garage in the Front Lawn. The Master Plan considers this area in case it is not selected for parking for the Medical Facilities Development.

- **12 - Kiss and Ride:** A kiss and ride facility would address several community and security issues related to transportation to the installation. It should be noted that this project would be constructed by Montgomery County and is included in the 2012 NSA Bethesda Master Plan for coordination purposes only; MCDOT would be the action proponent for this project.
    - A kiss and ride outside the gates would allow car pool commuters to be dropped off near the Medical Center Metro station without entering the secured perimeter of the installation.
    - This would allow northbound commuters on Rockville Pike to use a kiss and ride without having to make a left turn into the Metro station kiss and ride.
    - This would also address a community desire for a kiss and ride facility.
    - As indicated in Figure 2-6, there are two potential locations for this facility. The kiss and ride is included in the Master Plan for coordination purposes only. The Navy would not be responsible for the kiss and ride project.
- **13 - Building 54 & 55:** These garages are nearing the end of their useful life and require substantial annual investment and emergency repair. As part of this long-range plan, these buildings should be demolished and replaced. Replacement buildings should preserve the sky-bridge connections to Buildings 9 and 10 and should seek to implement additional connections to America Garage (Building 63) and the future Medical Center Building C.
- **14 - Building 50 Site:** Building 50 (Mercy Hall) is a residential building used for housing wounded warriors receiving care at the Medical Center. Although it was recently renovated, the building will be 50 years old in 2018 and is a candidate for redevelopment to improve both the use of and circulation through this difficult site. Redevelopment of this site presents an opportunity to upgrade an aging building while improving the circulation along this primary pedestrian route.

- **15- Wounded Warrior Area Improvements:** Several enhancements are proposed for the areas surrounding Building 60, 61, 62, and 11. These improvements are part of the Wounded Warrior Area Plan. The goal of this project is to improve the quality of the outdoor environment for wounded warriors and their families by improving pedestrian safety and circulation, incorporating new outdoor amenities, and enhancing natural features.

- **16 - G-Lot Medical Expansion:** The Master Plan states that G-Lot presents a good opportunity for future medical facility expansion development because of its proximity to the medical center.

- **17 - Building 26 AT/FP Renovation:** Current AT/FP guidelines require occupied buildings using conventional construction to maintain a 148-foot standoff from the installation's controlled perimeter. The current CDC, Building 26, does not meet this requirement. The proposed development that would increase the capacity of NSA Bethesda's CDC system does not address this issue.

- **18 - Satellite Pharmacy Relocation:** The Satellite Pharmacy, currently located east of the Bowling Center off Stokes Road, is a small facility that has potential to be relocated in the long term to free up valuable space for larger-scale development. The current Satellite Pharmacy building also does not meet the architectural standards of the IAP. A potential location for the pharmacy is along South Palmer Road adjacent to AFRRI.

- **Structured Parking Opportunities:** Opportunities for structured parking at NSA Bethesda would provide parking necessary to support future development. As surface lots are developed through a combination of buildings and open space, the displaced parking and the new requirements of development could be accommodated in structured parking. The Master Plan identifies the following structured parking opportunities that could help meet the potential future development demands:

    - **19 - H-Lot Site:** A new parking garage with approximately 495 spaces in H-Lot would provide accessible parking centralized within the southern half of the installation. This garage may be up to 6 stories, which is consistent with the height of the adjacent Navy Lodge. The same parking garage location is also analyzed in the EIS as a site for an above-ground parking structure as an alternative to the underground parking garage in the Front Lawn.

- **20 - Taylor Road Facilities:** This site, currently occupied by Buildings 53, 28, 79, 59 and 69, is adjacent to the proposed WWTL and its associated parking garage. This area is planned for an additional 3-story structure and potential utilities expansion. The structure could serve as a 300-space multi-use garage as an expansion of the existing WWTL garage, or as a stand-alone structure. Final type and use of structure is subject to change as the program is developed. This project requires the demolition of Buildings 53, 28, 79, 59 and 69. The same parking garage location is also analyzed in the EIS as a site for an above-ground parking structure as an alternative to the underground parking garage in the Front Lawn.

- **21 - N-Lot Site:** This area is identified for an additional 2-story parking structure and potential utilities expansion. This location is also analyzed in the EIS as an alternative site (Alternative 2) for the University Expansion.

Projects External to NSA Bethesda

The cumulative impacts analysis of this EIS also considered off-installation projects in the vicinity of NSA Bethesda to include the approved development projects shown in Table 5-2. The projects listed in Table 5-2 were provided by M-NCPPC and are part of the traffic No Build future condition analysis. Their locations and resultant contributions to peak trips in the area are provided in Section 4.7 of the EIS and Section 3.2 of Appendix D, Traffic Study. In addition, the traffic analysis lists roadway and transit improvement projects that are anticipated to be completed by 2018. These are described in Section 3.2, Appendix D, Traffic Study.

Table 5-2: Approved Off-Installation Background Developments

	Facility Name	Location	Dwelling Units (DU)/Square Footage (SF)
1	FASEB Office Addition	Southwest quadrant of Rockville Pike and Pooks Hill Road; north of Alta Vista Road; access to Rockville Pike and Pooks Hill Road	40,000 SF Office addition
2	Alta Vista at ACC	Southeast quadrant of Old Georgetown Road and Alta Vista Road; access to Alta Vista Road and Camberly Ave	37 Single-Family DUs
3	NIH – Porter Neuroscience Research Lab	West side of NIH campus near Old Georgetown Road	200 vehicles per day
4	Suburban Hospital	Southwest corner of Old Georgetown Road and Southwick Street	114,996 SF Expansion; 134,996 SF Standard of Care
5	Glen Aldon on Battery Lane	North/south sides of Battery Lane; West of Woodmont Avenue	694 High-Rise DUs replacing 260 Mid-Rise DUs
6	Woodmont View	Northwest corner of Woodmont Avenue and Battery Lane	46 Mid-Rise DUs, 3,200 SF Restaurant, and 1 Extended Stay Multi-Family Facility for 5 families replacing 4,200 SF General Office and 1 Single-Family DU
7	8300 Wisconsin Avenue	Between Wisconsin Avenue and Woodmont Avenue; north of Battery Lane	150 Room Hotel, 350 High-Rise DUs, and 50,000 SF Grocery store
8	Woodmont Central - A	Southwest corner of Wisconsin Avenue and Battery Lane	81,107 SF Office and 10,505 SF Retail replacing existing Gas Station (with Conv. Retail and Car Wash)
9[a]	Naval Support Activity Bethesda-BRAC Integration	East side of Rockville Pike; north of Jones Bridge Road	2,500 additional employees and 484,000 additional medical center visitors annually
10	Chevy Chase Lake East	Southeast quadrant of Connecticut Ave and Manor Road	74,356 SF Office and 174,016 SF Retail replacing 67,009 SF retail

Note: [a] This project is complete and reflected in the existing condition traffic volumes.

5.1 Geology, Topography, and Soils

The No Action Alternative does not involve Medical Facilities Development or University Expansion; therefore, it would not contribute to cumulative impacts on geology, topography, or soils.

Geology, topography, and soil impacts are site-specific and are not affected by cumulative development in the region, unless the projects are adjacent and occur at the same time or except where soil erosion may contribute to degradation of water quality. Section 5.2 discusses the potential sediment and erosion impacts on water quality.

Based on the current estimated construction timeframes and the proposed locations of the projects, construction activities for the Taylor Road Facilities parking garage alternative or the H-Lot parking garage alternative under the Medical Facilities Development could have incremental impacts on soil erosion. Neither of the University

Expansion alternatives are adjacent to any of the short-term planned projects and therefore, would not contribute to cumulative impacts.

The proposed locations of the Taylor Road Facilities parking garage alternative and the Sanctuary Hall (WWTL) parking garage are adjacent to each other and there would be partial overlap of construction timeframes. Similarly, the proposed locations of the H-Lot parking garage alternative and the Navy Lodge Expansion are adjacent to each other and the construction timeframes would partially overlap. Therefore, either of the above-ground parking garage alternatives under the Medical Facilities Development could add incremental impacts on soil erosion. However, as discussed further in Section 5.2, Water Resources, implementation of BMPs would minimize soil erosion impacts. Although there is construction overlap, it is anticipated that the initial construction phases of the Medical Facilities parking garage would occur after those of the WWTL parking garage and Navy Lodge Expansion; thereby, further minimizing the potential for cumulative soil erosion impacts.

As discussed, implementation of long-term opportunities projects would most likely occur after the completion of the Medical Facilities Development and the University Expansion. Therefore, cumulative impacts from the proposed actions are not anticipated in the context of the long-term projects.

No ongoing or reasonably foreseeable future projects off installation are in the vicinity of actions under either the Medical Facilities Development or University Expansion. Therefore, the proposed actions would not add incremental impacts on soils, geology, and topography to those to soils, geology, and topography impacts from off installation projects.

5.2 Water Resources Consequences

The No Action Alternative does not involve construction, demolition, or any renovation of buildings or change current operations at NSA Bethesda; therefore, it would not cause cumulative impacts on water resources.

Medical Facilities Development and University Expansion would increase the impervious surfaces on NSA Bethesda and thereby increase stormwater runoff with the potential to carry pollutants, including sediment, to streams. It would also decrease infiltration for groundwater recharge. The overall increase in impervious surfaces associated with the Medical Facilities Development is estimated to be: 0.64 acre (warehouse area parking garage alternative), 0.87 acre (H-Lot parking garage alternative), and 0.6 acre (Taylor Road Facilities parking garage alternative) and 0.6 acre for the back-up water tanks. The overall increase in impervious surfaces associated with the University Expansion is estimated to be 2.8 acres and up to 1.6 acres for Alternatives 1 and 2, respectively.

As Table 5-3 shows, there would be an estimated increase of 3.29 acres in impervious surface at NSA Bethesda from the ongoing construction of the Navy Exchange and parking garage and short-term planned projects within NSA Bethesda. Although estimates for the projects in Table 5-2 are not available, it is likely that those projects could increase impervious surfaces.

Table 5-3: Ongoing and Short-term Planned Projects at NSA Bethesda - Net Impervious Area

Project Name	Approximate Net Impervious Surface gain/loss in acres
Sanctuary Hall and Garage	0.75
CDC[1]	0
USO	0.14
Navy Exchange and Parking Garage	2.2
Navy Lodge Expansion	0.20
Rockville Pike Crossing	Small but unknown
Helipad Expansion	0.51
Total	3.29

[1] The CDC location is currently almost 100 percent impervious.

The increases in impervious surfaces from the Medical Facilities Development and University Expansion when combined with the increase in impervious surfaces associated with these ongoing and planned actions would result in increases in stormwater runoff. However, construction of ongoing and short-term planned projects at NSA Bethesda would be conducted in accordance with all applicable regulatory requirements for erosion and sediment control and stormwater management, thereby greatly reducing their impacts. These projects would also incorporate LID and green infrastructure, including LEED® features, further reducing impacts on water resources. The projects external to NSA Bethesda would also be required to adhere to the applicable regulatory requirements for erosion and sediment control and stormwater management. Therefore, with appropriate BMPs under the required stormwater management and erosion and sediment control plans, significant additive effects on surface and groundwater resources from the Medical Facilities Development and University Expansion would be avoided.

Implementation of the long-term opportunities projects would also be conducted in accordance with all applicable regulatory requirements for erosion and sediment control and stormwater management, thereby reducing their impacts. These projects would also incorporate LID and green infrastructure, including LEED® features, further reducing impacts on water resources. Therefore, cumulative impacts from the proposed actions are not anticipated to be significant in the context of the long-term projects.

5.3 Biological Resources Consequences

The No Action Alternative does not involve construction, demolition, or any renovation of buildings or change to current operations at NSA

Bethesda; therefore, it would not cause cumulative impacts on biological resources.

As Table 5-3 shows, the ongoing Navy Exchange project and short-term planned projects at NSA Bethesda would increase impervious surface by 3.29 acres. However, these areas consist of existing landscaped vegetation and are not expected to remove forests; thus, would not directly result in forested habitat loss or a reduction in the quality of forest habitat.

Medical Facilities Development and University Expansion Alternative 2 would occur in currently developed areas. Therefore, only scattered landscaped vegetation would be removed or existing development would be demolished and new facilities constructed on top. Therefore, there would be minimal impacts on biological resources from those proposed actions and cumulative impacts on biological resources are not anticipated.

University Expansion Alternative 1 would result in the loss of up to 4.2 acres of forest lands and a permanent impervious surface impact of approximately 2.8 acres; this would result in direct loss of wildlife through construction activities, and loss of habitat. Temporary and permanent alteration of wildlife habitat would occur. However, because the ongoing and short-term planned projects at NSA Bethesda would occur mostly in developed areas, incremental additional impacts on biological resources when the other projects are considered do not differ substantially from those discussed solely for University Expansion Alternative 1 and do not represent significant cumulative impacts.

It is not known whether projects external to NSA Bethesda would remove habitat of a more valuable nature, such as forest land. However, because Medical Facilities Development and University Expansion Alternative 2 would not remove habitat or vegetation of any significance, those proposed actions would not add impacts on any other projects being addressed under cumulative impacts. Because University Expansion Alternative 1 would result in the loss of up to 4.2 acres of forest lands and a permanent impervious surface impact of approximately 2.8 acres, there is potential for cumulative impacts on biological resources. However, University Expansion Alternative 1 is not located in proximity to any of the projects external to the installation, and the loss of forest lands would not be in a contiguous area. Therefore, while the potential for cumulative impacts from University Expansion Alternative 1 exists, it is not anticipated to be significant.

Implementation of the long-term opportunities projects would occur in mostly developed areas and would most likely take place after the completion of the Medical Facilities Development and University Expansion Alternatives 1 or 2. They would not affect biological resources of value contiguous to biological resources that may be

impacted by the proposed actions. Therefore, cumulative impacts on biological resources are not anticipated.

5.4 Air Quality

The No Action Alternative does not involve construction of the Medical Facilities Development, the University Expansion, or a change to current operations; therefore, it would not cause cumulative impacts on air quality, as discussed below.

NSA Bethesda has completed a General Conformity Rule applicability analysis that determined that annual emissions resulting from the construction and operations of the Medical Facilities Development and University Expansion would not be significant. The resulting effects of any combination of Medical Facilities Development and University Expansion alternatives at NSA Bethesda are well below the appropriate *de minimis* values for areas in nonattainment or maintenance for ozone and $PM_{2.5}$. These together have demonstrated that a full conformity determination is not required for the Medical Facilities Development and University Expansion. DoN has provided a RONA in Appendix B.

The analysis conducted takes the overall health of the airshed into consideration and is conducted, per regulation, separately for each proposed project. By demonstrating that any Medical Facilities Development or University Expansion alternative's emissions are below stated *de minimis levels* or thresholds, the EIS also demonstrates that cumulative air quality effects are not significant and would not pose a significant incremental effect to any other actions within the airshed, including the short-term planned projects occurring at NSA Bethesda, which must be separately evaluated by applicability analyses.

Regarding regulated operational stationary source emissions, the short-term planned projects do not include major stationary source requirements and are not expected to exceed the annual PSD emission limitations set by MDE for major modifications (Table 5-4). An additional consideration is NSA Bethesda's Title V permit, which allows the installation to emit no more than 75 TPY of NO_x from the central plant in any given year.

Table 5-4: Title V Permit Requirements at NSA Bethesda

	5.5 Total Emissions (TPY)			
	NO_x	**VOC**	**$PM_{2.5}$**	**SO_x**
PSD Limit	**40**	**40**	**15**	**40**
Title V Permit Requirement	**75**	**N/A**	**N/A**	**N/A**
Current Bethesda Emissions (2010)	8.89	4.23	0.90	9.15

Section 4.4 provides emission estimates for the operational stationary sources of the proposed actions that are approximately equal to or

less than current emissions. Annual emissions from stationary sources would remain considerably lower than permit limits. The additive effects of the proposed actions to potential stationary source emissions from the short-term or long-term opportunities projects, which have considerably lower requirements for heating or other stationary source components, would be minimal.

Additionally, the proposed actions would be expected to contribute 2,584 metric tons of CO_2e annually. For comparison, in the 2010 U.S. Inventory of GHGs, government and commercial facilities produced approximately 15 million metric tons of CO_2e (USEPA, 2012a). Therefore, emissions from the proposed actions would be approximately 0.0001 percent of the U.S. annual average.

Therefore, cumulative impacts on air quality would not be significant.

5.6 Noise

The No Action Alternative does not involve construction, demolition, or any renovation of buildings or change to current operations at NSA Bethesda; therefore, it would not cause noise impacts.

Construction associated with the Medical Facilities Development and University Expansion would be conducted over a large area within the installation, and would occur between 2013 and 2018. At times various components of the proposed actions as well as the short-term planned project would be under construction concurrently. However, the distance between projects, intervening structures and topography, and noise attenuation measures applied to the proposed actions and the short-term planned projects as appropriate, would result in minimal additive impacts on construction noise generated by any concurrent projects. Therefore, no cumulative adverse noise impacts are anticipated due to construction of the project components.

Because of the distance from NSA Bethesda to the external projects shown in Table 5-2, if the Medical Facilities Development and the University Expansion were to occur at the same time as those projects, there would not be an incremental increase in noise impacts and no cumulative noise impacts.

5.7 Utility/Infrastructure

The No Action Alternative would not cause cumulative impacts on utility infrastructure.

Short-term planned projects including those addressed in the EIS as well as the CDC expansion, USO development, Navy Exchange expansion, and Navy Lodge expansion would increase the overall utility demands for the installation. Table 5-5 shows the estimated water/sewer and electrical loads for the short-term planned projects.

These projects are identified in the 2012 NSA Master Plan Update and have been included in prior Master Plan updates. This installation-

wide advance planning approach provides a basis for the coordinated construction of utility improvements versus constructing piecemeal improvements as the various NSA Bethesda projects come to fruition. Some of the short-term planned projects include replacing outdated buildings with LEED® Silver designed energy efficient ones.

Local providers of electricity, water, and wastewater indicated that the increased utility demands required to support NSA Bethesda's short-term planned projects can be met. Provision of natural gas requires evaluation when design detail is available to determine supplier capacity or necessary improvements; however, fuel oil can substitute for natural gas regardless of the results of the evaluation.

The Navy is coordinating with the service providers to ensure that these proposed changes do not affect service delivery to the larger community by verifying that the system can accommodate the additional load.

Long-term projects and opportunities would further increase the installation's demands for utilities. Specific utility demands for these projects have not yet been developed. When these projects become more defined, NSA Bethesda would share the potential utility demands with local and regional suppliers so these demands can be incorporated along with other regional growth into the suppliers' long-term planning strategies.

Table 5-5: Estimated Water/Sewer and Electric Loads for Short-Term Planned Projects

Project	Water/Sewer[1] (GPD)	Electrical Loads[2] (kVA)
Sanctuary Hall (WWTL) – Garage[3]		
Sanctuary Hall (WWTL) - Building	14,000	765
Navy Lodge	6,000	300
USO	5,400	220
CDC	4,400	66
Rockville Pike	N/a	N/a
Helipad	N/a	N/a
Building 20	N/a	N/a

[1] Source: NAVFAC, 20111.
[2] Source: NSAB, 2012.
[3] Source data do not break down WWTL loads into garage and building, therefore, the table assigns all loads to the Building.

5.8 Transportation

As presented in Section 4.7, Transportation and Traffic Consequences, the analysis for transportation for the 2018 Action (Build) Alternatives considered the projected growth in the region based upon

the background development (proposed projects outside of NSA Bethesda), the approved future roadway projects, and two short-term planned projects (Sanctuary Hall and Navy Lodge) as part of the 2018 No Build condition. As discussed, one ongoing project, the new Navy Exchange and parking garage, is also included in the No Build condition. Impacts for each of the 2018 Build Alternatives were assessed with the project growth and roadway improvements from the 2018 No Build condition, plus the addition of new trips generated by the Medical Facilities Development and University Expansion.

Each 2018 Build Alternative considered the addition of new trips generated by the Medical Facilities Development and University Expansion based on a maximum trip generation equaling the proposed 270 new employees for eight out of the ten 2018 Build Alternatives. The other two 2018 Build Alternatives had fewer than 270 employees, thus lower trip generation rates, as fewer than 270 parking spaces would be available.

Because trip generation is based on locations without any transit, these estimates provide a conservative measure of cumulative impacts; some of these trips might use public transit; join a vanpool; or carpool, bike, or walk to the installation as discussed in the 2011 Transportation Management Program Update.

To summarize, the greatest cumulative impacts for the 2018 Build Alternatives were considered as part of the traffic analysis, which includes growth from other projects and are identified in the impact assessment in Section 4.7. Therefore, additional incremental impacts from the proposed actions beyond those already presented in Section 4.7 are not expected.

The 2018 No Build Alternative does not involve the implementation of the Medical Facilities Development and University Expansion and therefore would not cause cumulative impacts on traffic that differ from those described under the analysis in Section 4.7.

As discussed in Section 4.7 and Appendix D, under conservative assumptions related to requirements to bring in construction materials and remove demolition or construction debris, the Build Alternatives add an average of 37 new trucks daily during the most intense 1-year construction period for the proposed actions. These 37 trucks, when allocated to current hourly truck arrival rates at NSA Bethesda and added to the existing truck arrivals at Gate #5, would have a less than 2 percent probability of exceeding the available space at the Gate #5 commercial vehicle inspection facility that could cause queuing. The short-term planned projects in the aggregate are smaller with less earth-moving or demolition, and would require a smaller number of trucks. Most intense periods of construction for the short-term planned projects are not scheduled to be concurrent with the period of most intense construction under the proposed actions. Therefore, the combination of proposed actions and short-term planned projects is not expected to change the situation at Gate #5 to

increase queuing. Similarly, the long-term opportunities are not expected to occur with the intense periods of construction under the proposed actions; therefore, trucks supporting the proposed actions would not add to trucks from these projects to cause cumulative traffic impacts. Given the absence of queuing at Gate #5, there would be no effects to traffic off installation, and therefore no cumulative effects in relation to the projects off the installation.

5.9 Cultural Resources

The No Action Alternative does not involve construction of the Medical Facilities Development, the University Expansion, or a change to current operations; therefore, no cumulative impacts on cultural resources are expected to occur under this alternative.

Although there has been a loss of certain historic resources at NSA Bethesda over the past 5 years, the centerpiece landmark, the Central Tower Block and its landscape setting, have been protected. The Medical Facilities Development and University Expansion, with proper design, agency review, and execution would have no adverse impact on documented cultural resources. However, the Warehouse and Taylor Road Facilities parking garage alternatives for the Medical Facilities Development could require the demolition of small structures that need DOEs for NRHP, and the determination process would require concurrence by MHT before being considered final. If they are eligible, their demolition would be avoided, minimized, or mitigated.

Per NHPA, the Navy evaluates each potential historic resource individually and in the context of other historic resources in the vicinity and the process ensures that incremental impacts are considered and resolved. Among the short-term planned projects, the USO could have the potential for impacts on historic resources due to its proximity to the NRHP-eligible Flag Houses. Before implementation of the project, the Navy would conduct Section 106 consultation to resolve adverse effects on historic properties. Therefore, cumulative impacts on cultural resources are not anticipated.

The Navy would conduct Section 106 consultation to resolve adverse effects on historic properties before implementing the long-term opportunities projects. Therefore, cumulative impacts on cultural resources are not anticipated.

Cultural resources impacts are specific to NSA Bethesda, therefore, Medical Facilities Development and the University Expansion would not add to cumulative impacts on the external projects identified in Table 5-2.

5.10 Land Use and Zoning

The No Action Alternative does not involve construction of the Medical Facilities Development, the University Expansion, or a change to current operations; therefore, no cumulative impacts on land use or aesthetics are expected to occur under this alternative.

Both the Medical Facilities Development and the University Expansion are compatible with existing functional zones on NSA Bethesda. Therefore, as the proposed actions' locations are consistent with the medical and educational functional zones within NSA Bethesda, they would not cause cumulative impacts within the installation. As discussed, the traffic analysis for the EIS includes the ongoing and short-term planned projects. The results (Section 4.7) show that there would be no significant impacts on any of the internal intersections when comparing the 2018 No Build condition to the 2018 Build Alternatives with the implementation of the Medical Facilities Development and the University Expansion. Therefore, the proposed actions would not have cumulative impacts on land use.

The Medical Facilities Development and the University Expansion are within the property boundaries of NSA Bethesda and their land uses are consistent with the fundamental medical care land use designated for NSA Bethesda. Both the Medical Facilities Development and the University Expansion are consistent with the purposes of the NIH, across Rockville Pike. Therefore, they are consistent with land uses within the region.

Medical Facilities Development and University Expansion Alternative 1 would be located in an already highly developed area and additional construction would not alter the aesthetic setting. Additionally, as discussed, with proper design, agency review, and execution would have no adverse impact on documented cultural resources such as Tower 1. Therefore, those proposed actions would not contribute to cumulative impacts.

University Expansion Alternative 2 would alter the visual character of the proposed location and the proposed new structures would have long-term impacts on the existing visual character of the area. Of the short-term planned projects, the Navy Lodge Expansion is located in proximity to University Expansion Alternative 1. However, the construction phases of the two projects would not overlap and the new Navy Lodge building would be located sufficiently distant from University Expansion Alternative 1 that cumulative impacts are not anticipated.

The Medical Facilities Development's proposed above-ground parking structure alternatives, designated as the Taylor Road Facilities, H-Lot site, and the warehouse area site, would each be located on a site identified as a long-term opportunity area for structured parking. However, the placement of a parking structure on these sites would not conflict with the long-term intended use of these sites since the use of these sites for the Medical Facilities Development parking would allow general visitors, patients, and staff of NSA Bethesda to park in the structured parking; the users of these garages would be similar to the intended users of parking structures identified under each of the long-term structured parking opportunities.

The University Alternative 2 site would be sited on land that is designated under the long-term opportunity areas for construction of an N-Lot parking garage that would service patients, visitors, and staff of NSA Bethesda. Construction of the University Expansion on this land would not allow the construction of the N-Lot parking garage. While the University Expansion does include the construction of a parking garage, this garage would likely be for the exclusive use of the University, and it is expected that general visitors, patients, and staff of NSA Bethesda would not be able to park in this garage.

The Medical Facilities Development and the University Expansion are consistent with land uses within the region. As discussed, the traffic analysis for the EIS includes the external projects in Table 5-2. The results (Section 4.7) show that there would be no significant impacts on any of the intersections or arterials of external roadways when comparing the 2018 No Build condition to the 2018 Build Alternatives with the implementation of the Medical Facilities Development and the University Expansion. Therefore, the proposed actions would not have cumulative impacts on land use.

5.11 Socioeconomics

The No Action Alternative does not involve construction of the Medical Facilities Development or the University Expansion or constitute a change to current operations; therefore, present socioeconomic conditions would be expected to remain as they exist under the baseline conditions and no cumulative effects would be expected to occur.

The Medical Facilities Development and the University Expansion would add minimal growth and need for services in the ROI. Section 4.10 addresses these regional effects and concludes that the impacts are not significant. Since implementation of the Medical Facilities Development and the University Expansion is not expected to have a disproportionately high and adverse human health or environmental effect on minority, low-income, or younger segments of the local population, they do not cause cumulative impacts for purposes of environmental justice when considered with any other actions in the area.

As discussed in Section 5.9, the traffic analysis for the EIS shows that there would be no significant impacts on any of the intersections or arterials of external roadways when comparing the 2018 No Build condition to the 2018 Build Alternatives with the implementation of the Medical Facilities Development and the University Expansion. Therefore, the proposed actions would not have cumulative impacts on the traffic in the area.

5.12 Human Health and Safety

If any of the short-term planned and long-term opportunity projects would change the condition or existence of any USTs or ASTs or require new fuel tanks, the existing tanks would be emptied prior to their

removal, any remediation needed would occur, and new tanks would be designed and installed to meet the applicable Federal and state regulations for accidental spill prevention, detection, and containment so that there would be no cumulative impacts on human health and safety.

The short-term planned and long-term opportunity projects are unlikely to produce hazardous waste in quantities that would have any effect in combination with that likely to be generated under the Medical Facilities Development or the University Expansion alternatives.

Because NSA Bethesda was built prior to the implementation of AT/FP standards the majority of the existing facilities on the campus do not meet standoff distances or separation goals for buildings, parking, and perimeters. AT/FP standards would be evaluated and incorporated into the design of all new structures to be constructed under the short-term planned and long-term opportunity projects. Therefore, it in concert with the Medical Facilities Development and University Expansion, it is expected that cumulative beneficial impacts on human health and safety would occur.

The projects external to NSA Bethesda are separated by distance and would not interact with projects at the installation from the perspective of human health and safety impacts.

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9.0 ACRONYMS

ACHP - Advisory Council on Historic Preservation

ACM – asbestos-containing material

ACS – American Community Survey

ADA - Americans with Disabilities Act

AFRRI - Armed Forces Radiobiology Research Institute

AOCs - Areas of Concern

AQCR – Air-Quality Control Region

AQI – Air Quality Index

AST - above-ground storage tank

AT/FP – Anti-Terrorism/Force Protection

B.C.E. – Before Common Era

BMP – Best Management Practices

BRAC - Base Realignment and Closure

CAP - Corrective Action Permit

CBD – Central Business District

CDC - Child Development Center

CEQ - Council on Environmental Quality

CFR - Code of Federal Regulations

CLV - Critical Lane Volume

CMP - comprehensive master plan

CNIC - Commander, Navy Installations Command

CO_2e – carbon dioxide equivalent

COMAR – Code of Maryland Regulations

CUP – Central Utility Plant

CVIF – commercial vehicle inspection facility

dB - decibel

dBA – A-weighted decibels

DHB - Defense Health Board

DoD - Department of Defense

DOE - Determination of Eligibility

DoN - Department of Navy

DU – Dwelling unit

EIS - environmental impact statement

EISA 2007 - Energy Independence and Security Act of 2007

EO - Executive Order

EPAct 2005 - Energy Policy Act of 2005

ESA - Endangered Species Act

FASEB – Federation of American Societies for Experimental Biology

FEMA - Federal Emergency Management Agency

FIDS – forest interior dwelling species

FY – Fiscal Year

GHG – greenhouse gases

gpd – gallons per day

gpm - gallons per minute

HCM - Highway Capacity Manual

HSAS - Health Systems Advisory Subcommittee

I-495 - Interstate 495

IAP – Installation Appearance Plan

ICRMP – Integrated Cultural Resources Management Plan

INRMP - NNMC Integrated Natural Resources Management Plan

ITE - Institute of Transportation Engineers

JTF - Joint Task Force

JTF CapMed - Joint Task Force National Capital Region Medical

kV – kilovolt

kVA – kilovolt ampere

LATR - Local Area Transportation Review

LBP - lead-based paint

LCME - Liaison Committee on Medical Education

LEED - Leadership in Energy and Environmental Design

LID - Low Impact Development

LOS – level of service

MARC – Maryland Area Regional Commuter

MCAA - Medical Center Addition and Alterations

MCDOT - Montgomery County Department of Transportation

MCFRS – Montgomery County Fire and Rescue Service

MDE - Maryland Department of the Environment

MDNR - Maryland Department of Natural Resources

MD SHPO – Maryland State Historic Preservation Office(r), same as MHT

MGD – million gallons per day

MHS – Military Health System

MHT - Maryland Historical Trust, same as MD SHPO

M-NCPPC - Maryland National Capital Park and Planning Commission

MOU - Memorandum of Understanding

mph – miles per hour

MSHA - Maryland State Highway Administration

MSL - mean sea level

MVA - mega volt-ampere

NAAQS – National Ambient Air Quality Standards

NAVAC – Naval Facilities Engineering Command

NCA - Noise Control Act

NCPA - National Capital Planning Act

NCPC - National Capital Planning Commission

NCR - National Capital Region

NDAA - National Defense Authorization Act

NDW - Naval District Washington

NEPA - National Environmental Policy Act

NHPA - National Historic Preservation Act

NIH - National Institutes of Health

NNMC - National Naval Medical Center

NOA - Notice of Availability

NOI - Notice of Intent

NRHP - National Register of Historic Places

NSA Bethesda - Naval Support Activity Bethesda

OEA - Department of Defense’s Office of Economic Adjustment

PBX - Private Branch Exchange

PEPCO - Potomac Electric Power Company

PM – particulate matter

PSD – Prevention of Significant Deterioration

psi – pound per square inch

RCNM - Roadway Construction Noise Model

RCRA - Resource Conservation and Recovery Act

RIMP - Regionally Integrated Master Program

RMW - regulated medical waste

ROD - Record of Decision

ROI - region of influence

RONA – Record of Non-applicability

RTV - rational threshold value

SF – single family OR square feet

SLM – sound level meter

SNCO - Senior Non-Commissioned Officer

SOPs – standard operating procedures

SWMU - Solid Waste Management Unit

T&E – threatened and endangered

TMP – Transportation Management Plan

TPY - tons per year

UFC – Unified Facilities Criteria

USDA - U.S. Department of Agriculture

USEPA - U.S. Environmental Protection Agency

USFWS – U.S. Fish and Wildlife Service

USO – United Service Organizations

UST – underground storage tank

USU or the University - Uniformed Services University of the Health Sciences

VIP - very important person

WMATA – Washington Metropolitan Area Transportation Authority

WRAMC - Walter Reed Army Medical Center

WRNMMC - Walter Reed National Military Medical Center

WSSC – Washington Suburban Sanitary Commission

WWTL - Wounded Warrior Transition Lodge

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10.0 APPENDICES

Appendix A - Correspondence and Public Involvement

Appendix B – Air Quality Analysis

Appendix C – Noise

Appendix D – Traffic Study

Appendix E – Economic Impact Forecast System Model

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