



Armed Forces Retirement Home Master Plan Update

Draft Supplemental Environmental Impact Statement

November 2017

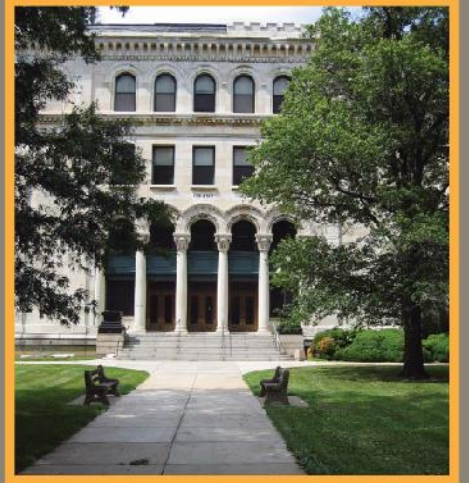
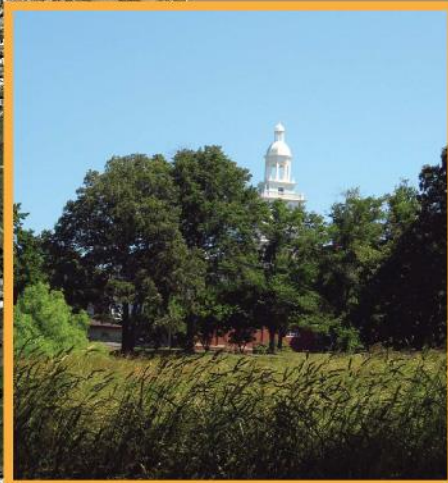
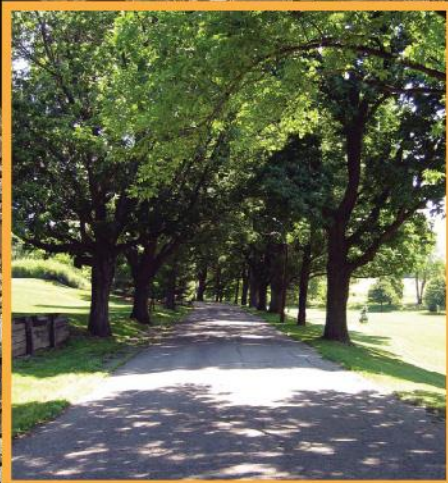
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Draft Supplemental Environmental Impact Statement

Responsible Agency:

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Armed Forces Retirement Home Master Plan Update

The Armed Forces Retirement Home (AFRH) is preparing a Supplemental Environmental Impact Statement (SEIS) to analyze the potential impacts from updating their Master Plan for its campus located at 3700 North Capitol Street, NW in Washington, DC.

The SEIS has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. Probable environmental impacts and potential mitigation measures have been identified for a No Action Alternative and Master Plan Alternative.

Questions or comments on the Draft SEIS should be addressed to:

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Executive Summary

The Armed Forces Retirement Home (AFRH) has prepared a Supplemental Environmental Impact Statement (SEIS) to analyze the potential impacts from the implementation of the Master Plan for its campus located at 3700 North Capitol Street, NW, in Washington, DC and known as AFRH-W. A Final EIS which analyzed potential impacts associated with implementation of a site Master Plan for AFRH-W was issued in November 2007. In 2008, AFRH issued a Record of Decision to implement the Master Plan, and at that time, selected a developer to lease underutilized land and implement a mixed use program consisting of commercial, residential, institutional and other uses. Implementation of the Master Plan would add approximately 4,764,995 gross square feet of development to the existing 376,479 gross square feet on the campus for a total of 4,801,083 gross square feet of development. Since the 2007 Final EIS, the selected developer for the project and AFRH were unable to reach an agreement for the project to proceed. AFRH now anticipates releasing a Request for Proposals (RFP) to solicit proposals and select a new developer to move forward with the mixed use development. In addition, the original FEIS was completed prior to Executive Order 13693. Supplemental information is required to analyze the impacts of energy usage and alternate energy sources for the expansion of the Federal facility as well as analyze the impacts of agency actions on climate change.

This Draft SEIS has been prepared pursuant to:

- The National Environmental Policy Act of 1969 (NEPA);
- Council on Environmental Quality (CEQ) regulations to implement NEPA contained in 40 Code of Federal Regulations (CFR) Parts 1500 to 1508; and
- The AFRH's implementing regulations (38 CFR 200).

ES.1 Proposed Action

The purpose of the proposed action is to implement the Master Plan for AFRH-W, as approved in 2008, which would include the Heating Plant, to sustain AFRH and its primary source of funding, the AFRH Trust Fund.

Currently, AFRH's fixed income sources are insufficient to fund campus operations and improvements. AFRH historically has not received an annual appropriation to fund its operations. For the past 165 years, AFRH has financed its operations with income from its Trust Fund established with funds provided by Congress after the Mexican-American War. The Trust Fund is capitalized through resident fees (limited by law at 35 percent of a resident's income of which fewer than seventy percent (70%) pay the maximum); 50 cent paycheck contributions from active duty enlisted military personnel; fines and forfeitures by the military (which have reduced by half due to the reduction of in forces after the Iraq War); and interest on the Trust Fund (law restricts investments to US Treasury Bills) and other smaller investments.

While expenses at AFRH have slightly increased over time and the existing buildings have aged, requiring more upkeep, contributions to the Trust Fund have been drastically reduced. In FY 2009 AFRH total revenue receipts equaled \$62.4M. IN FY 2016, AFRH total revenue receipts had

fallen to \$47.5M, a 24% reduction since 2009. Due to expenses outpacing income, Congress authorized \$42M in FY 2016 and FY 2017 to temporarily support AFRH operations.

In order to improve AFRH's financial situation, the following steps were taken at AFRH-W: vacant or underutilized buildings were mothballed or leased, the two campuses were brought under one business model to increase efficiency, administrative chores were outsourced to other federal agencies, and performance based contracts were let for transportation, trash removal, custodial services, facility maintenance, ground maintenance, security and dining services. While these innovations helped, cost saving measures alone cannot generate the funds needed to cover the current gap between mandatory expenses and AFRH's current revenue streams.

AFRH has to cope with forces beyond its control which affect its financial situation. Revenue can increase in a time of war as the amount collected in fines from military personnel goes up, but this is not a reliable revenue stream. Receipts from fines have diminished significantly in the last 5 years. Additionally, costs may unexpectedly rise as they did when the number of residents at the Washington, DC campus increased by over 300 to accommodate residents displaced from the Gulfport facility by Hurricane Katrina.

AFRH-W needs to generate reliable sources of revenue to support the Trust Fund and ensure a sustainable retirement home. AFRH faces \$18 million in deferred maintenance/required capital improvement projects which will require funding over the next ten years. Furthermore, AFRH must prepare to meet the needs of the next generation of enlisted personnel who are living longer with chronic medical conditions and who will have special housing and medical needs as they age.

Therefore, to reconcile the current annual \$20 million operating loss and ensure the financial stability of AFRH for future generations of retired military personnel, AFRH intends to take advantage of the leasing authority under U.S.C Title 24 §411 and leverage the value of its real estate by leasing land that is underutilized.

AFRH's goal is to generate sufficient revenue to continue providing the best housing and comprehensive support services in an independent living retirement community for America's Armed Forces retired enlisted personnel, and have the ability to develop future facilities for their changing population.

To achieve this goal, AFRH-W is implementing a financial strategy that will:

- Create financial net growth and stability for its Trust Fund;
- Generate additional revenues to meet the continuous capital improvement and day-to-day operating needs of AFRH-W; and
- Reduce AFRH-W's reliance on variable and unpredictable revenue sources.

The magnitude of AFRH's current operating losses of \$20 million annually, the projected future capital needs for new facilities, and the availability of land lease authority to benefit the AFRH Trust Fund (24 USC 411) has led AFRH to focus on a range of land development alternatives to meet its need. AFRH has only had direct Congressional appropriations in very limited circumstances, and has been directed by Congress and the Department of Defense to manage its Trust Fund and operate as a self-sufficient non-appropriated agency. It is highly unlikely that AFRH will become an appropriated agency, especially given the magnitude of funding required for its capital program, existing budget deficits, and current military spending priorities. AFRH has in the past sought legislation that would incrementally increase returns on its Trust Fund by allowing AFRH to invest in vehicles other than Treasury bills, as it is currently limited to, but no legislation of this type has been passed; even if it were, returns would not likely be sufficient to meet AFRH's immediate operating expenses. In addition, while AFRH is currently receiving appropriated funding to cover operating losses, such funding is temporary as expressed by DoD and OMB. Executing a leased development per the Master Plan is necessary to assist AFRH in becoming solvent once again.

ES.2 Alternatives

No Action Alternative

Under the No Action Alternative, the action proposed in this SEIS would not be taken. AFRH-W would remain under Federal ownership, with AFRH as the holding agency. No additional new construction would occur on AFRH-W under this alternative. The site would continue to be underdeveloped, with scattered, unused, and mostly non-revenue producing buildings. The facility would remain fenced and guarded, with entry from Rock Creek Church Road restricted to those with business on site. The No Action Alternative does not support the intent of the National Defense Authorization Act of 2002, which allows AFRH to sell or lease its land as a means to replenish the ARFH Trust Fund.

Under this Alternative, the opportunities to raise revenue for AFRH would be limited to the reuse of existing buildings, including the Grant Building, the King Hospital Complex, and the LaGarde Building. A total of approximately 538 parking spaces would be created to serve these buildings.

Master Plan Alternative

The AFRH-W Master Plan Alternative is comprised of the development proposed in the 2008 Final Master Plan. This alternative was studied in the 2007 Final EIS as Alternative 3A, which was selected for implementation in the 2007 Record of Decision. Within the 2008 Master Plan, proposed development was eliminated from Zones B and C, between the golf course and Rock Creek Church Road, to provide a buffer between the residential areas to the west and the new development on the southeastern portion of the site. The resulting Master Plan Alternative includes development in two zones, the AFRH Zone and Zone A, the development zone, which includes the Heating Plant (see Figure 2-2). Development in the AFRH Zone would take place as AFRH needs new facilities, while development in Zone A would be undertaken by a private developer to generate income for the AFRH Trust Fund. The AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within this zone. Zone A is designated for residential, office/research and development, retail, hotel, and medical uses.

ES.3 Impacts

1.1 Stormwater Management

No Action Alternative

No direct, indirect, or cumulative impacts would occur.

Master Plan Alternative

- Disturbance of soils from construction on AFRH-W campus would result in temporary, adverse impacts to stormwater quality.
- The permanent increase in impervious surface from the development of Zone A would result in long-term increase in stormwater runoff.

1.2 Greenhouse Gases and Climate Change

No Action Alternative

No direct, indirect, or cumulative impacts would occur.

Master Plan Alternative

- Emissions from construction vehicles would result in a temporary increase in Greenhouse Gases (GHG) being released into the atmosphere.
- Emissions from mobile and stationary sources as a result of the implementation of the Master Plan would result in a long-term, minor increase in GHG emissions and contribute negligibly to climate change.
- Indirect adverse impacts would result from an increase in energy use after the proposed development is complete.

1.3 Land Use Planning and Zoning

No Action Alternative

No direct, indirect, or cumulative impacts would occur.

Master Plan Alternative

Implementation of the Master Plan could serve as a catalyst for future development in the surrounding area which could result in changes in land use and zoning.

1.4 Transportation

No Action Alternative

- Baseline development and growth of the surrounding area would result in major, adverse impacts to traffic.

Master Plan Alternative

- Implementation of the Master Plan would cause additional growth in the area and would result in major, adverse impacts to traffic in the area.
- There would also be major adverse impacts to transit systems as a result of increased ridership.

1.5 Environmental Contamination

No Action Alternative

No direct, indirect, or cumulative impacts would occur.

Master Plan Alternative

The removal of hazardous waste and contaminants on the site would result in a long-term beneficial impact to human health and safety.

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Table of Contents

Executive Summary.....	iii
ES.1 Proposed Action.....	iii
ES.2 Alternatives.....	v
ES.3 Impacts.....	vi
1.1 Stormwater Management	vi
1.2 Greenhouse Gases and Climate Change.....	vi
1.3 Land Use Planning and Zoning.....	vi
1.4 Transportation.....	vi
1.5 Environmental Contamination	vii
List of Tables	xii
List of Figures	xiii
List of Acronyms.....	xv
1.0 Purpose and Need for the Proposed Action.....	1-1
1.1 Introduction.....	1-1
1.2 Purpose of the Proposed Action.....	1-1
1.3 Need for the Proposed Action.....	1-1
1.4 Project Objectives.....	1-3
1.5 Site Background.....	1-4
1.6 Project Area – AFRH-W.....	1-5
1.7 AFRH’s Planning Process.....	1-5
1.7.1 Master Plan.....	1-5
1.7.2 Programmatic Agreement	1-7
1.7.3 Developer Selection.....	1-8
1.8 Statutes, Regulations, Plans and Executive Orders that Influence the Scope of this EIS.....	1-9
1.8.1 Statutes.....	1-9

1.8.2	Regulations	1-9
1.8.3	Plans.....	1-9
1.8.4	Executive Orders.....	1-10
1.9	EIS Process	1-10
1.10	Decision that Must Be Made	1-10
1.11	Organization of the EIS	1-11
2.0	Alternatives Including the Proposed Action	2-1
2.1	Alternatives Studied in Detail	2-1
2.1.1	No Action Alternative	2-1
2.1.2	Master Plan Alternative.....	2-1
2.2	Alternatives Eliminated from Detailed Study	2-3
2.2.1	Alternatives Dismissed in the 2007 Final EIS.....	2-3
2.2.2	Alternatives Considered in the 2007 Final EIS.....	2-3
2.3	Summary of Impacts.....	2-10
3.0	Affected Environment and Impacts to the Human Environment.....	3-1
3.1	Affected Environment and Impact Assessment Methodology.....	3-1
3.2	Topics Dismissed from Further Analysis.....	3-1
3.2.1	Geology, Topography, and Soils	3-2
3.2.2	Water Resources.....	3-3
3.2.3	Biological Resources	3-4
3.2.4	Social Environment.....	3-4
3.2.5	Cultural Resources.....	3-10
3.2.6	Air Quality.....	3-12
3.2.7	Noise	3-12
3.2.8	Utilities.....	3-12
3.3	Topics Retained for Further Analysis.....	3-14

3.4	Stormwater Management	3-15
3.4.1	Impacts to Stormwater Management	3-16
3.5	Greenhouse Gases and Climate Change.....	3-19
3.5.1	Impacts to Greenhouse Gases and Climate Change.....	3-20
3.6	Land Use Planning and Zoning.....	3-25
3.6.1	Impacts to Land Use Planning and Zoning.....	3-31
3.7	Transportation	3-35
3.7.1	Impacts to Traffic.....	3-45
3.7.2	Impacts to Transit Services.....	3-61
3.7.3	Impacts to Pedestrians and Bicycle Facilities	3-66
3.8	Environmental Contamination	3-69
3.8.1	Impacts to Environmental Contamination	3-71
3.9	Unavoidable Adverse Impacts	3-72
3.10	Existing Relationships between Local Short-term Uses of the Proposed Action and Maintenance and Enhancement of Long-Term Productivity	3-73
3.11	Irreversible or Irrecoverable Commitment of Resources	3-73
3.12	Summary of Proposed Mitigation Measures under the Preferred Alternative (Master Plan Alternative).....	3-73
4.0	References	4-1
5.0	List of Preparers.....	5-1
6.0	Distribution List.....	6-1
	Appendix A Transportation Analysis.....	A-1

List of Tables

Table 1-1: Proposed NEPA Schedule.....	1-10
Table 2-1: Proposed Development for the Master Plan Alternative	2-2
Table 2-2: Alternative 2 Proposed Developments	2-4
Table 2-3: 2007 Final EIS Alternative 3B and 3C Proposed Development	2-6
Table 2-4: 2007 Final EIS Alternative 4 Proposed Development	2-8
Table 2-5: Summary of Impacts	2-10
Table 3-1: Study Area Demographics.....	3-6
Table 3-2: Housing Characteristics.....	3-7
Table 3-3: Impervious Area	3-16
Table 3-4: Stormwater Retention Volume Requirements	3-17
Table 3-5: Estimate of Total Annual Pollutant Loads (lbs/yr)	3-17
Table 3-6: Greenhouse Gas Emissions from Increased Natural Gas Boiler Capacity for the Master Plan Alternatives	3-23
Table 3-7: Study Area Major Corridor Characteristics	3-35
Table 3-8: Observed Queuing	3-38
Table 3-9: Merge, Diverge, and Weaving Segments LOS Criteria	3-39
Table 3-10: LOS Criteria for Signalized Intersections	3-39
Table 3-11: 2015 Existing Condition LOS at Studied Intersections	3-40
Table 3-12: 2015 Existing Condition LOS at for Merge/Diverge/Weave Areas	3-41
Table 3-13: Existing Transit Services in Vicinity of AFRH-W.....	3-42
Table 3-14: Existing Bus Route Capacity	3-44
Table 3-15: 2045 No Action Alternative LOS at Studied Intersections	3-46
Table 3-16: 2045 No Action Alternative LOS at Studied Intersection for Merge/Diverge/Weave Areas	3-47
Table 3-17: Mixed-Use Development (Zone A) Trip Generation (With Trip Credits)	3-48
Table 3-18: Targeted Mode Splits.....	3-49
Table 3-19: 2045 Master Plan Alternative LOS at Studied Intersections.....	3-51
Table 3-20: 2045 Master Plan Alternative LOS at for Merge/Diverge/Weave Areas	3-52
Table 3-21: 2045 Master Plan Alternative Mitigation Measure Phasing.....	3-54
Table 3-22: 2045 Master Plan Alternative with Mitigation LOS at Studied Intersections	3-54
Table 3-23: 2045 Master Plan Alternative with Mitigation LOS at for Merge/Diverge/Weave Areas	3-55
Table 3-24: 2045 No Action Alternative with Crosstown Study Network LOS at Studied Intersections	3-56
Table 3-25: 2045 No Action Alternative with Crosstown Study Network at for Merge/Diverge/Weave Areas	3-57

Table 3-26: 2045 Master Plan Alternative with Crosstown Study Network LOS at Studied Intersections..	3-57
Table 3-27: 2045 Master Plan Alternative with Crosstown Study Network at for Merge/Diverge/Weave Areas.....	3-58
Table 3-28: Vehicle Mitigation Measure Implementation Strategy	3-60
Table 3-29: 2045 Master Plan Alternative with Crosstown Study Network and Mitigation LOS at Studied Intersections.....	3-60
Table 3-30: 2045 Master Plan Alternative with Crosstown Study Network with Mitigation LOS for Merge/Diverge/Weave Areas	3-61
Table 3-31: 2045 Background/No Build Condition Transit Capacity Analysis Results	3-62
Table 3-32: AFRH-W Full Build-Out Transit Trip Generation	3-63
Table 3-33: AFRH-W Full Build-Out Transit Trip Distribution	3-63
Table 3-34: 2045 Future Build Condition Transit Capacity Analysis Results.....	3-64
Table 3-35: 2045 Future Build Condition with Mitigation Transit Capacity Analysis Results.....	3-65
Table 3-36: Remediation Efforts since 2006 Phase II ESA.....	3-69

List of Figures

Figure 1-1: Regional Location Map	1-4
Figure 1-2: AFRH-W Campus.....	1-6
Figure 1-3: Master Plan Zones	1-7
Figure 2-1: 2007 Final EIS Alternative 2 Development Zones.....	2-5
Figure 2-2: 2007 Final EIS Alternative 3 Development Zones.....	2-7
Figure 2-3: 2007 Final EIS Alternative 4 Development Zones.....	2-9
Figure 3-1. Study Area Census Tracts.....	3-5
Figure 3-2: Existing Land Use (DCOP 2006).....	3-29
Figure 3-3: Zoning (DCOZ 2017a)	3-30
Figure 3-4: Armed Forces Retirement Home Master Plan TIS Study Area	3-37
Figure 3-5: Metrobus and Metrorail Service in the Vicinity of AFRH-W (WMATA 2016)	3-43
Figure 3-6. Proposed External Bicycle and Pedestrian Facilities.....	3-69

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List of Acronyms

ACHP	Advisory Council on Historic Preservation
ACOE	United States Army Corps of Engineers
ACM	Asbestos Containing Material
ACS	American Community Survey
ADT	Average Daily Traffic
AFRH	Armed Forces Retirement Home
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
AVO	Average Vehicle Occupancy
BMPs	Best Management Practices
CAA	Clean Air Act
CBPA	Chesapeake Bay Protection Act of 1988
CDD	Coordinated Development District
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLV	Critical Lane Volume
C-O	Commercial Office (Zoning)
CO	Carbon Monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act of 1972
DLA	Defense Logistics Agency
DOT	Department of Transportation
DSP	Development Site Plan
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESD	Environmental Site Design
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
GHG	Greenhouse Gas
GSA	General Services Administration
gsf	gross square footage
HCM	Highway Capacity Manual

HVAC	Heat, Ventilation, Air Conditioning
ISC	Interagency Security Committee
ITE	Institute of Transportation Engineers
IWG	Interagency Federal Working Group
LEED®	Leadership in Energy and Environmental Design
LOA	Letter of Authorization
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MAC	Major Activity Center
MBTA	Migratory Bird Treaty Act
mph	miles per hour
MSAT	Mobile Source Air Toxics
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O₃	Ozone
Pb	Lead
PDC	Planned Development Commercial
PDH	Planned Development Housing
PEPCO	Potomac Electric Power Company
RBC	Risk Based Concentration
RCP	Reinforced Concrete Pipe
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RLP	Request for Lease Proposal
RMA	Resource Management Area
RPA	Resource Protection Area
rsf	Rentable Square Feet
SAP	Small Area Plan
SF	Square Feet
SFO	Solicitation for Offers
SHPO	State Historic Preservation Office

SIP	State Implementation Plan
SO₂	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
TMP	Transportation Management Plan
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WMATA	Washington Metropolitan Area Transit Authority
WOUS	Waters of the United States
WQIA	Water Quality Impact Assessment

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1.0 Purpose and Need for the Proposed Action

1.1 Introduction

The Armed Forces Retirement Home (AFRH) has prepared an SEIS to analyze the potential impacts from the implementation of the Master Plan for its campus located at 3700 North Capitol Street, NW, in Washington, DC and known as AFRH-W (see Figure 1-1, Regional Location Map). A Final EIS, which analyzed potential impacts associated with implementation of a site Master Plan for AFRH-W was issued in November 2007. In 2008, AFRH issued a Record of Decision to implement the Master Plan, and at that time, selected a developer to lease underutilized land and implement a mixed use program consisting of commercial, residential, institutional and other uses. Implementation of the Master Plan would add approximately 4,424,604 gross square feet of development to the existing 376,479 gross square feet on the campus for a total of 4,801,369 gross square feet of development. Since the 2007 Final EIS, the selected developer for the project and AFRH were unable to reach an agreement for the project to proceed. AFRH now anticipates releasing a Request for Proposals (RFP) to solicit proposals and select a new developer to move forward with the mixed use development.

In order to comply with the National Environmental Policy Act (NEPA) (see 40 CFR 1502.9), an SEIS is needed to update the findings in the 2007 Final EIS. Factors that have changed since the previous study include demolition and replacement of the previous Scott Building, on the AFRH-W campus; a \$15 million restoration and expansion of the Lincoln's Cottage historic site; closure and anticipated reuse of the Heating Plant and inclusion of the Plant in the development area; elimination of development in Zones B and C, and the anticipated development of the McMillan Reservoir parcel immediately south of AFRH-W along with other area development. Supplemental information is required to analyze the impacts of these changes, particularly impacts from traffic that may be generated by redevelopment of the AFRH-W and the other area development.

In addition, the 2007 Final EIS was completed prior to Executive Order 13693, Planning for Federal Sustainability in the Next Decade; and Executive Order 13653, Preparing the United States for the Impacts of Climate Change. Supplemental information is required to analyze the impacts of energy usage and alternate energy sources for the expansion of the AFRH-W as well as to analyze the impacts of the development on climate change in accordance with these Executive Orders.

1.2 Purpose of the Proposed Action

The purpose of the proposed action is to implement the Master Plan for AFRH-W, as approved in 2008, which would include the Heating Plant, to sustain AFRH and its primary source of funding, the AFRH Trust Fund.

1.3 Need for the Proposed Action

AFRH has identified a need to leverage its land assets to generate revenue to support its current mission to operate a resident-focused retirement community for military enlisted veterans at AFRH-W.

Currently, AFRH's fixed income sources are insufficient to fund campus operations and improvements. AFRH does not receive an annual appropriation to fund its operations. For the past 165 years, AFRH has financed its operations with income from its Trust Fund established with funds provided by Congress.

The Trust Fund is capitalized through resident fees (limited by law at 35 percent of a resident's income of which fewer than half pay the maximum); 50 cent paycheck contributions from active duty enlisted military personnel (rising to \$1.00 per paycheck in Summer 2015); fines and forfeitures by the military (which historically are higher during time of war); and interest on the Trust Fund (law restricts investments to US Treasury Bills) and other smaller investments.

AFRH-W plunged into a financial crisis in the 1990s when expenses routinely began to outstrip revenues. In 2002, Congress ordered AFRH-W to hire professional managers with experience in retirement community operations and gave AFRH-W permission to develop its underutilized property in order to replenish the Trust Fund and generate new funding sources.

The purpose of the proposed action is to implement the Master Plan for AFRH-W, as approved in 2008, which would include the Heating Plant, to sustain AFRH and its primary source of funding, the AFRH Trust Fund.

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- Create financial net growth and stability for its Trust Fund;
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The magnitude of AFRH's current operating losses of \$20 million annually, the projected future capital needs for new facilities, and the availability of land lease authority to benefit the AFRH Trust Fund (24 USC 411) has led AFRH to focus on a range of land development alternatives to meet its need. AFRH has only had direct Congressional appropriations in very limited circumstances, and has been directed by Congress and the Department of Defense to manage its Trust Fund and operate as a self-sufficient non-appropriated agency. It is highly unlikely that AFRH will become an appropriated agency, especially given the magnitude of funding required for its capital program, existing budget deficits, and current military spending priorities. AFRH has in the past sought legislation that would incrementally increase returns on its Trust Fund by allowing AFRH to invest in vehicles other than Treasury bills, as it is currently limited to, but no legislation of this type has been passed; even if it were, returns would not likely be sufficient to meet AFRH's immediate operating expenses. In addition, while AFRH is currently receiving appropriated funding to cover operating losses, such funding is temporary as expressed by DoD and OMB. Executing a leased development per the Master Plan is necessary to assist AFRH in becoming solvent once again.

1.4 Project Objectives

The objectives of AFRH-W Master Plan are to:

- Preserve and improve the essential components of AFRH-W for the residents and the community;
- Provide sufficient revenue to support AFRH's goal of resident-focused care while replenishing the depleting Trust Fund;
- Grow the Trust Fund to not only meet the needs of today's residents, but the needs of future generations as well;
- Attract development, at fair market value, that is compatible with the mission of AFRH; and
- Ensure an open, participatory process with AFRH-W residents and the community.

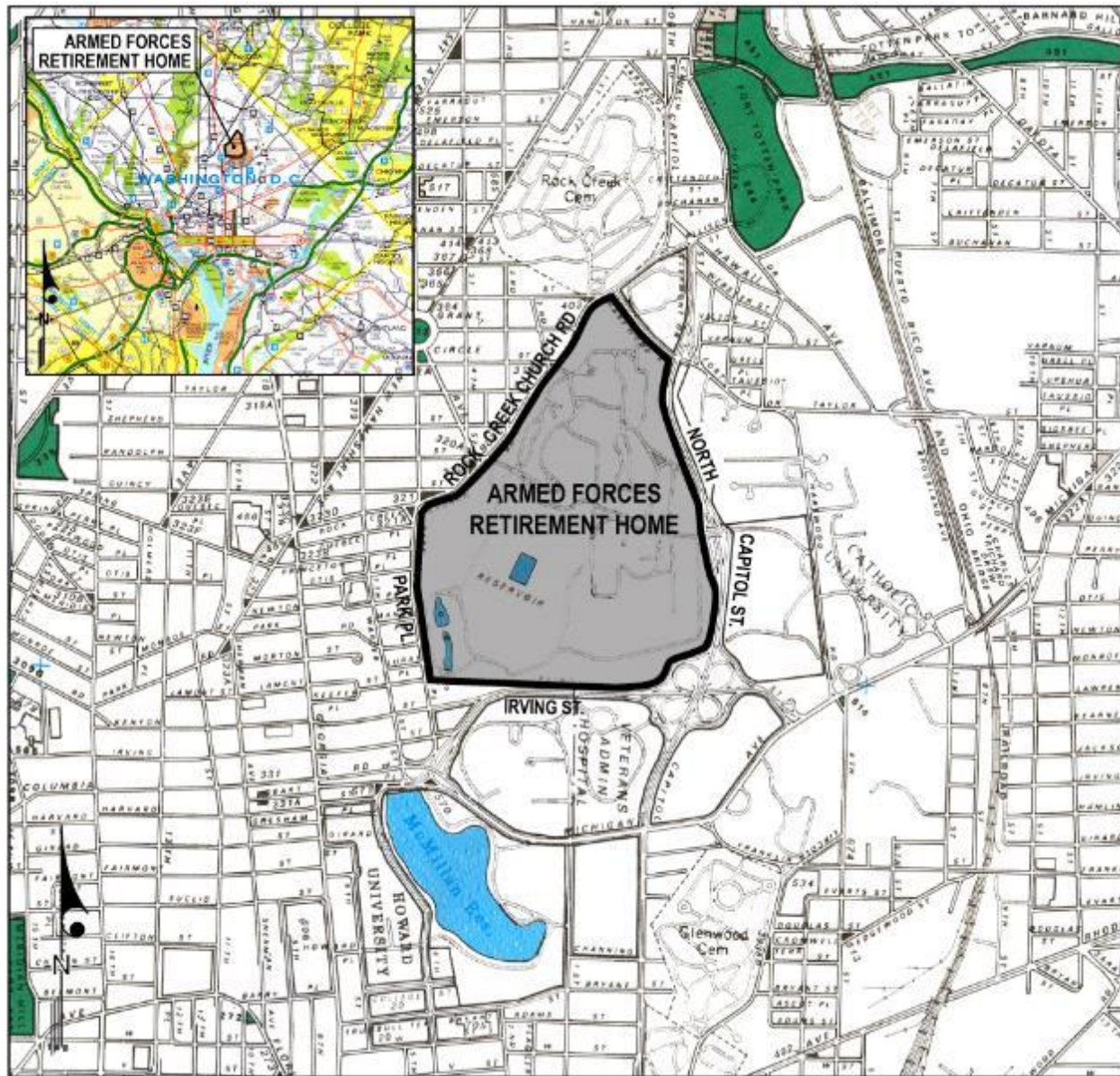


Figure 1-1: Regional Location Map

1.5 Site Background

In 1851, for the property now known as AFRH-W was established as the northern branch of a new Congressionally organized U.S. Military Asylum, an institution created to provide care for old and disabled veterans with monies levied from the Mexican-American War. Four of the original buildings still stand. Two of the buildings, Quarters 1 and Lincoln College, served as the summer White House for U.S. Presidents—Chester Arthur, Rutherford B. Hayes, James Buchanan and, most notably, Abraham Lincoln. In 1859, the U.S. Military Asylum was renamed the U.S. Soldier's Home, and in 1972 the institution was again renamed the U.S. Soldiers' and Airmen's Home.

In 1991, Congress incorporated the U.S. Soldiers' and Airmen's Home and the U.S. Naval Home in Gulfport, Mississippi, into an independent establishment in the Executive Branch of the federal government, known as AFRH. In 2001, Congress renamed the U.S. Soldiers' and Airmen's Home and the

U.S. Naval Home to the Armed Forces Retirement Home - Washington and Armed Forces Retirement Home - Gulfport, respectively. AFRH-W is currently home to nearly 600 military veterans.

1.6 Project Area – AFRH-W

The project area is comprised of the 272-acre AFRH-W campus (see Figure 1-2) located in north central Washington, DC. The southern border of the campus follows Irving Street, NW. The western border is formed by Park Place, NW and Rock Creek Church Road, NW. The northeastern border follows Harewood Road, NE and North Capitol Street.

The property includes dormitories, long-term care and assisted living facilities, chapels, a golf course, and various other administrative and support facilities. Over 100 buildings are listed on AFRH-W's building inventory. Some of the facilities once used for maintenance are now vacant because many of those functions are now outsourced. The entire campus is designated as a historic district in the National Register of Historic Places and the District of Columbia Inventory of Historic Sites. Two smaller areas of campus carry further designation as the President Lincoln and Soldiers' Home National Monument and the US Soldiers' and Airmens' Home National Historic Landmark. Additional information on the existing conditions within the project area is located in Chapter 3, Affected Environment.

1.7 AFRH's Planning Process

1.7.1 Master Plan

The National Capital Planning Commission (NCPC) requires master plans for Federal installations in the National Capital Region to facilitate long-range development on the installation. In August 2008, AFRH obtained NCPC approval for a Master Plan to guide the development of its real estate in Washington, DC. The Master Plan provides the basis for directing future development by the private sector, thereby increasing revenue to the Trust Fund. The Master Plan also addresses the need for new facilities for AFRH-W.

The AFRH-W Master Plan divides the site into two zones: AFRH Zone and Zone A. AFRH Zone is the larger of the two zones and will remain designated primarily for the use of AFRH. Zone A and the Heating Plant Area, or the "Development Zone," may be sold or leased in order to generate revenue for AFRH (see Figure 1-3).

The AFRH-W Master Plan includes design guidelines specific to each zone and corresponding subzones, as well as guidelines that apply to the site as a whole. The guidelines address historic resources, building design, access and security, street types, parking, bicycle paths, signage, and landscape. The landscape

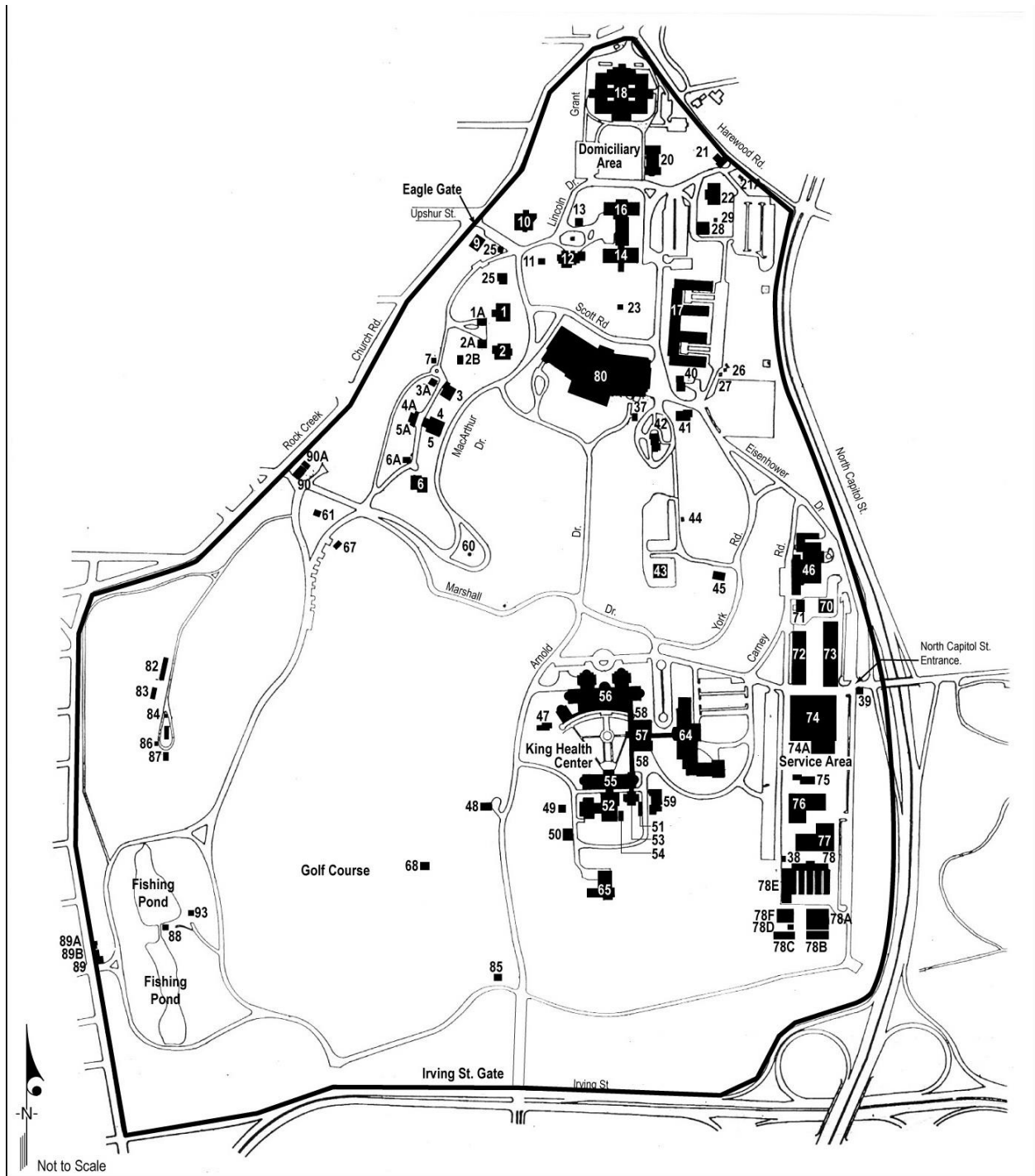


Figure 1-2: AFRH-W Campus

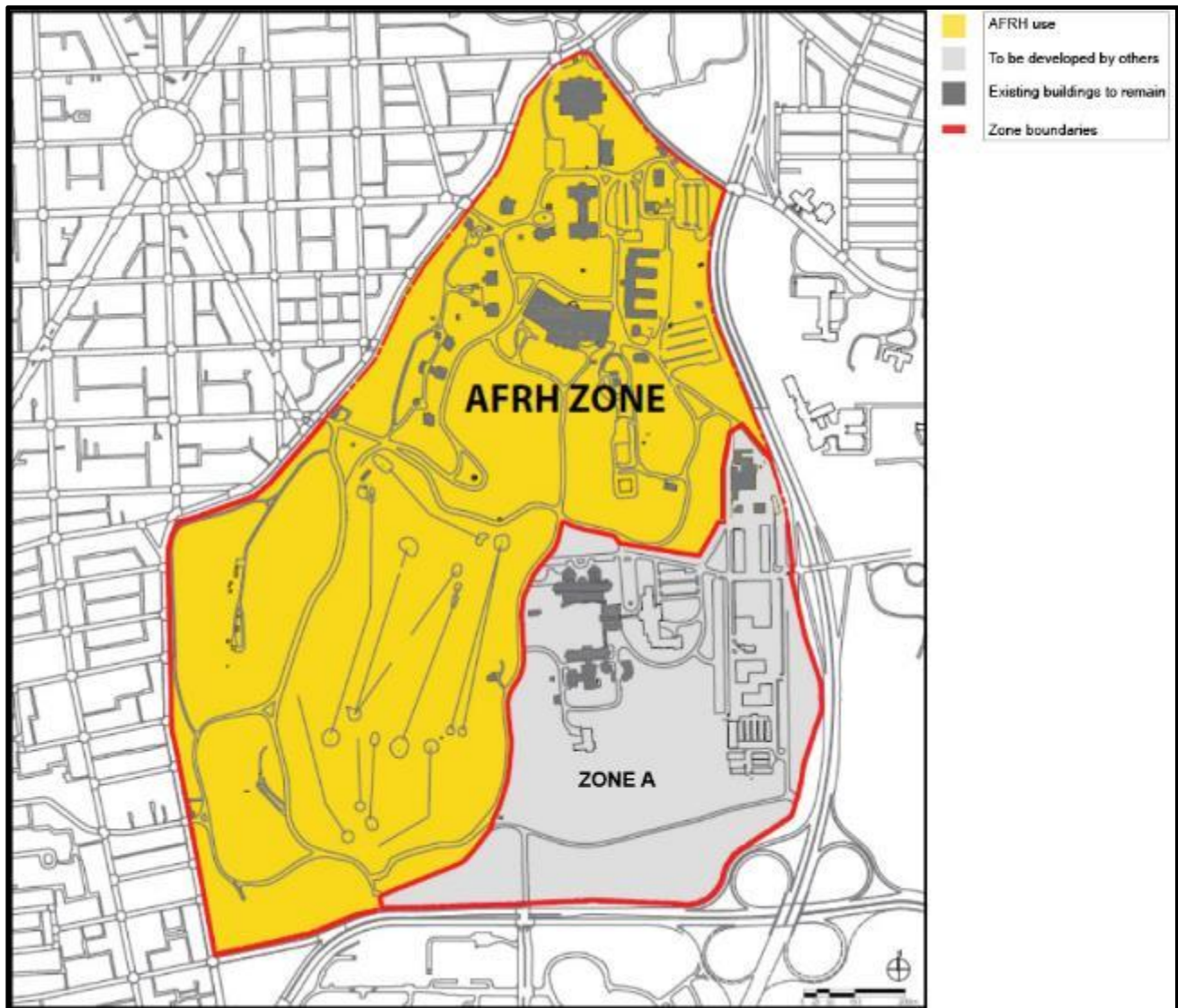


Figure 1-3: Master Plan Zones

guidelines address significant elements comprehensively such as the topography and views, open space, the site perimeter, treescape, and streetscapes, as well as smaller elements such as foundation plantings, commemorative objects, and site furnishings.

Per NCPD guidance, AFRH is preparing an amendment to the 2008 Master Plan that would revise Zone A to include the former heating plant. The inclusion of the Heating Plant in Zone A would not result in major changes to the existing use or a significant change in the impacts on- or off-site. Therefore, AFRH will continue to use the 2008 Master Plan and its amendment to guide future development of the AFRH-W facility.

1.7.2 Programmatic Agreement

In March 2008, in accordance with Section 106 of the National Historic Preservation Act (NHPA), AFRH entered into a programmatic agreement (AFRH-WPA) with the National Park Service (NPS), NCPD, the Advisory Council on Historic Preservation (ACHP), and the District of Columbia State Historic Preservation Officer (DCSHPO). The purpose of the agreement is to mitigate adverse effects anticipated from mixed-use development outlined by the AFRH-W Master Plan and to ensure compliance of

specified undertakings with Sections 106 and 110 of the NHPA. The agreement provides requirements for implementation of the AFRH-W Master Plan; review and approval of changes to the Master Plan; mitigation measures to mitigate the adverse effects of the development on AFRH-W; and implementation of a Historic Preservation Plan for the site.

In March 2015, AFRH and the PA signatories executed an amendment to the agreement that clarifies the previously agreed-upon distinction between the review processes for two categories of undertakings: (1) AFRH undertakings and other undertakings on federal land at AFRH-W that is not subject to District of Columbia zoning; and (2) private undertakings for private purposes on federal land at AFRH-W that is subject to District of Columbia zoning. The amendment also addresses the 2014 recodification of the National Historic Preservation Act (NHPA).

In February 2015, the DCSHPO concurred with a Finding of No Adverse Effect for an Undertaking Review Request (URR #40) proposing the ground lease of the Heating Plant (Building 46), which was decommissioned in October 2013. URR #40 states that AFRH will negotiate a ground lease for the Heating Plant and surrounding site for purpose of adaptive reuse of the historic building by a private developer. AFRH can lease the Heating Plant site as an individual parcel or as part of the ground lease for Zone A, and the lease will include covenants that ensure the application of appropriate standards and guidelines (specific language for the covenants is provided in the URR). The URR also states that pursuant to the 2007 Memorandum of Agreement, the Heating Plant site may be zoned if intended for non-federal use. DCSHPO concurred with the finding of No Adverse Effect with the condition that DCSHPO is afforded the opportunity to review the language of the covenant before the lease is executed.

1.7.3 Developer Selection

Following publication of the Draft EIS in May 2005, AFRH with the assistance of the U.S. General Services Administration (GSA) began the process of identifying a developer for AFRH-W. In March 2007, AFRH selected Crescent Resources LLC as its preferred developer to construct a mixed-use redevelopment project of approximately 4.3 million square feet of new space on the southeast corner of its Washington campus. A Final EIS was prepared and issued in November 2007 that assessed the impacts of the developer's concepts as well as changes to the other development zones. Subsequently, AFRH failed to reach an agreement with Crescent Resources, and the redevelopment project was put on hold during the economic downturn.

AFRH is currently preparing a Request for Qualifications/Request for Proposal to select a master developer for Zone A, that would include the Heating Plant; for private-sector use, providing AFRH with an alternate income stream. The GSA is working with AFRH to issue the solicitation and select a master developer.

Following the publication of the Draft Supplemental EIS, AFRH with the assistance of GSA will begin the process of identifying an developer for AFRH-W. AFRH will issue a Request for Qualifications/Request for Proposals to solicit concepts for mixed use redevelopment of Zone A. AFRH will review the proposals and select a preferred developer. The Final EIS will include an assessment of potential impacts from the selected developer.

1.8 Statutes, Regulations, Plans and Executive Orders that Influence the Scope of this EIS

This section lists the statutes, regulations, and executive orders that govern and/or influence the scope of this EIS. A number of statutes were considered but found to have no influence on this project. Although this list is not all-inclusive, the proposed alternatives must comply with all applicable legal requirements.

1.8.1 Statutes

- National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §4321-4347)
- National Historic Preservation Act (NHPA) of 1966 (54 U.S.C. § 300101, et seq.) (89 P.L. 665 (1966)); (referred to herein as “Section 106”)
- Clean Air Act (CAA) of 1970 as amended (42 U.S.C. § 7401, et seq.)
- Clean Water Act (CWA) of 1977 as amended (33 U.S.C. § 1251, et seq.)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (42 U.S.C. § 9601, et seq.)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. §470aa-mm),
- Endangered Species Act of 1973 (16 U.S.C. §1531-1544)
- The National Defense Authorization Act for Fiscal Year 2010 (111 P.L. 111-84, 24 U.S.C. §401, et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. § 6901, et seq.)
- Section 5 of the National Capital Planning Act of 1952 (82 P.L. 592; 66 Stat. 781, et seq.); (codified as amended at 40 U.S.C. §8722(b)(1))

1.8.2 Regulations

- Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508)
- 38 CFR Part 200 – Compliance with the National Environmental Policy Act (AFRH’s NEPA implementing regulations)
- 36 CFR Part 800—Protection of Historic Properties
- 32 CFR Part 229—Protection of Archaeological Resources: Uniform Regulations
- 40 CFR 6, 51, and 93 – Conformity of General Federal Actions to State or Federal Implementation Plans
- 33 CFR 320-330 – U.S. Army Corps of Engineers Regulations
- 40 CFR Parts 300 through 399 – Hazardous Substance Regulations
- 40 CFR Part 61 Subpart M – National Emission Standard for Asbestos
- Secretary of the Interior Standards and Guidelines for Archeology and Historic Preservation (Federal Register, Vol. 48, No. 190, 44716-44742)

1.8.3 Plans

- Comprehensive Plan for the National Capital: Federal Elements, National Capital Planning Commission (2016)

- Comprehensive Plan for the National Capital: District Elements, District of Columbia (2011)

1.8.4 Executive Orders

- E.O. 11593 – Protection and Enhancement of the Cultural Environment
- E.O. 11988 – Floodplain Management
- E.O. 11990 – Protection of Wetlands
- E.O. 12898 – Environmental Justice
- E.O. 13287 – Preserve America
- E.O. 13327 – Federal Real Property Management
- E.O. 13690 – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input
- E.O. 13693 – Planning for Federal Sustainability in the Next Decade

1.9 EIS Process

NEPA is intended to help public officials make decisions that are based on an understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment. These decisions are to be made on accurate scientific analysis, expert agency comments, and public scrutiny of readily available environmental information. Federal agencies are obligated to follow the provisions of this statute to identify and assess reasonable alternatives to the proposed action that will avoid or minimize any adverse effects on the quality of the human environment.

The current schedule for completing the NEPA process for the proposed action is found in Table 1-1. The scheduled dates for the remaining actions will be maintained as closely as possible.

Table 1-1. Proposed NEPA Schedule

Step	Approximate Date
Publication of the NOI	April 2, 2015
Publication of Notice of Availability (NOA) for Draft SEIS	November 17, 2017
Public Comment Period on Draft SEIS	November 17 – January 2, 2018
Public Hearing on Draft SEIS	Week of December 11, 2017
Publication of Notice of Availability for Final SEIS	February 2019
Public Review Period on Final SEIS	February – March 2019
ROD	April 2019

1.10 Decision that Must Be Made

At the conclusion of the SEIS process, the Chief Operating Officer of AFRH will make a decision regarding the alternatives for the proposed Master Plan. This decision will be documented in a Record of Decision (ROD) that will identify the selected alternative and any proposed mitigation measures.

1.11 Organization of the EIS

Consistent with the CEQ regulations, this EIS is organized into the following chapters:

- Chapter 1 explains the purpose and need for the proposed action.
- Chapter 2 describes and compares the alternatives for the proposed AFRH-W Master Plan.
- Chapter 3 describes the affected environment, that is, the existing conditions within the study area and beyond that could be affected by the proposed action; and evaluates the environmental consequences of each alternative including no action (maintaining status quo).
- Chapter 4 contains references for studies, data, and other resources used in the preparation of this EIS.
- Chapter 5 contains a list of people involved in the preparation of this document.
- Chapter 6 contains the distribution list for this EIS.

A series of appendices provides more information on certain topics.

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2.0 Alternatives Including the Proposed Action

As stated in Chapter 1, the proposed action assessed in this document is the implementation of the 2008 Master Plan for AFRH-W that will sustain AFRH and its primary source of funding, the AFRH Trust Fund. The Master Plan prescribes development within different areas of AFRH-W. Potential development was defined after taking into consideration compatibility with AFRH's mission, compatibility with historic resources and existing environmental conditions, compatibility with surrounding land uses, and analysis of real estate market conditions in the area. Private or governmental development on AFRH-W would occur primarily through leases or sales. The decision to lease or sell would be made based on economic analysis, and is not part of this EIS.

2.1 Alternatives Studied in Detail

2.1.1 No Action Alternative

Under the No Action Alternative, the action proposed in this SEIS would not be taken. AFRH-W would remain under Federal ownership, with AFRH as the holding agency. No additional new construction would occur on AFRH-W under this alternative. The site would continue to be underdeveloped, with scattered, unused, and mostly non-revenue producing buildings. The facility would remain fenced and guarded, with entry from Rock Creek Church Road restricted to those with business on site. The No Action Alternative does not support the intent of the National Defense Authorization Act for Fiscal Year 2010, which allows AFRH to sell or lease its land as a means to replenish the AFRH Trust Fund.

Under this Alternative, the opportunities to raise revenue for AFRH would be limited to the reuse of existing buildings, including the Grant Building, and the King Hospital Complex. A total of approximately 538 parking spaces would be created to serve these buildings.

While the No Action Alternative does not meet the purpose and need for the proposed action, nor fulfill the objectives of the proposed action as described in Section 1, it is studied in this SEIS to provide a baseline for assessing the magnitude of environmental effects of the action alternatives.

2.1.2 Master Plan Alternative

The AFRH-W Master Plan Alternative is comprised of the development proposed in the 2008 Final Master Plan and also includes the Heating Plant. This alternative was studied in the 2007 Final EIS as Alternative 3A, which was selected for implementation in the 2007 Record of Decision. Within the 2008 Master Plan, proposed development was eliminated from Zones B and C, between the golf course, and Rock Creek Church Road, to provide a buffer between the residential areas to the west and the new development on the southeastern portion of the site. The resulting Master Plan Alternative includes development in two zones, the AFRH Zone and Zone A, the development zone (see Figure 1-3). Development in the AFRH Zone would take place as AFRH needs new facilities, while development in Zone A would be undertaken by a private developer to generate income for the AFRH Trust Fund. The AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within this zone. Zone A is designated for residential, office/research and development, retail, hotel, and medical uses.

A summary of the development proposed in the Master Plan is included below in Table 2-1.

Table 2-1: Proposed Development for the Master Plan Alternative

LAND USE			
	Height (# of Feet)	Gross Square Footage	Parking Spaces
EXISTING & TO REMAIN		1,319,239	
Institutional		1,319,239	
AFRH Zone		398,000	
North-Northeast (Institutional)	55-85	350,000	700
Chapel Woods (Residential)	36	42,000	42
Golf Course		6,000	
Zone A (Development Zone)	45-120	4,403,083 *	5,189
Residential		2,280,477	
Commercial		1,191,391	
Medical		290,650	
Retail		214,086	
Asst. Living		214,000	
Hotel		126,391	
Heating Plant Area		36,088	
Potential Future Retail		50,000	
TOTAL NEW DEVELOPMENT		4,801,083 **	5,931
AFRH GRAND TOTAL		6,120,322	

* The breakout of land use square footages for the Development Area are approximations and subject to change in response to market conditions. The total number of parking spaces for the Development Area will depend upon the final square footages associated with each land use and the applicable parking ratios.

** Gross development square footage does not include above ground parking structures in Zone A; however, the EIS assesses the impacts of parking on the site.

The Master Plan Alternative is the Preferred Alternative for redevelopment of AFRH-W. This alternative best meets the needs of AFRH and the objectives of the Master Plan including:

- Maximize development of AFRH-W while maintaining the historic character of the site and retaining significant existing open space;
- Provide development uses that are complementary to the Home;
- Ensure that AFRH's facilities are conveniently located for its residents and that there is room for new AFRH facilities on the north campus;
- Provide for the security of the residents of the Home;
- Encourage the rehabilitation and reuse of historic buildings;
- Integrate the landscape and the built form; and
- Where appropriate, respect the character of the adjacent communities and integrate the new development into the city fabric.

The Master Plan Alternative addresses issues raised through community review, Section 106 consultation and NCPC actions on the 2008 Master Plan. From the revenue generating perspective, it includes a diverse program of uses, thus allowing for flexibility to adjust to changes in market conditions and demand for particular uses.

2.2 Alternatives Eliminated from Detailed Study

2.2.1 Alternatives Dismissed in the 2007 Final EIS

Several alternatives were considered in the original EIS in response to suggestions from stakeholders. Alternatives that were considered in response to suggestions from stakeholders and were not included for further analysis are described below.

Seek Congressional Appropriations

AFRH has never had direct Congressional appropriations, and has been directed by Congress and the Department of Defense to manage its Trust Fund and operate as a self-sufficient non-appropriated agency. It is highly unlikely that AFRH will become an appropriated agency, especially given the magnitude of funding required for its capital program, existing budget deficits, and current military spending priorities. AFRH has in the past sought legislation that would incrementally increase returns on its Trust Fund by allowing AFRH to invest in vehicles other than Treasury bills, as it is currently limited to, but no legislation of this type has been passed; even if it were, returns would not likely be sufficient to meet AFRH's immediate capital requirements. In addition, even if AFRH were to receive additional funding, a Master Plan would still be needed to guide development on AFRH-W. For these reasons, AFRH's need is best met by considering the land development alternatives and developing a Master Plan for AFRH-W.

None of the development alternatives suggested would generate sufficient revenue for AFRH-W's needs. AFRH-W has deferred maintenance needs of over \$18 million, and as yet unquantifiable needs to meet housing and healthcare requirements of veterans of Gulf Wars I and II who may reside at AFRH-W, and the veterans from Iraq and Afghanistan wars with brain trauma, multiple amputations, and historically high levels of post-traumatic stress disorder, and their related special housing and health care needs.

Expand and improve the golf course to create a private city golf club

The creation of a private city golf club would not generate enough funds, by orders of magnitude, to support AFRH's mission. Therefore, this alternative was dismissed from further consideration.

Convert homes on General's Row into a bed and breakfast inn, a cocktail lounge, a commissary, shops, meeting rooms, a pharmacy, or outlet shops

Retail shops are being considered under several alternatives discussed above. However, they would be located outside of the secured the AFRH Zone. As well, additional land use development is necessary in order to provide sufficient revenue to support AFRH's goal of resident-focused care while replenishing the Trust Fund. Therefore, this alternative was dismissed from further consideration.

Extend Soldiers' Home Cemetery

Extending the Soldiers' Home Cemetery would not generate enough funds to provide sufficient revenue to support AFRH's mission. Therefore, this alternative was dismissed from further consideration.

2.2.2 Alternatives Considered in the 2007 Final EIS

In the 2007 Final EIS, AFRH considered a variety of density alternatives to developing AFRH-W to determine whether they were feasible and whether they would meet the project's purpose and need

and objectives. These alternatives (Alternatives 2, 3A, 3B, 3C, and 4) were based on varying density development build-outs within four development zones – Zones A through C and the AFRH Zone. After careful consideration, Alternative 3A was selected for implementation in the December 2007 Record of Decision. Alternatives 2, 3B, 3C, and 4, though studied in detail in 2007, did not provide the best solution to meet AFRH’s mission and needs. These alternatives, which are now dismissed from further consideration are described below.

2007 Final EIS - Alternative 2

Under Alternative 2, studied in the 2007 Final EIS, AFRH-W would be developed to accommodate the development outlined in Table 2-2. The program and density were derived from private sector concepts to redevelop portions of the site for medical and research and development purposes, given the site’s proximity to the medical area to the south and planned expansions on the part of some of those hospitals.

Table 2-2: Alternative 2 Proposed Developments

Type of Development	Gross Square Footage
Institutional	2,550,000
Residential	992,000
Hotel/Conference Center	200,000
Research & Development	3,200,000
Retail	130,000
Medical	1,600,000
TOTAL	8,672,000

Figure 2-1 delineates the distribution of development uses under Alternative 2 on the four AFRH-W development zones. Under this alternative:

- The AFRH Zone would be designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within these Zones.
- Zone A and B would be designated for educational uses and medical uses compatible with the Washington Hospital Center development south of Irving Street.
- Zone C would contain residential development compatible with the residential development west of Rock Creek Church Road. This zone would also potentially include retail development to serve the residential areas.

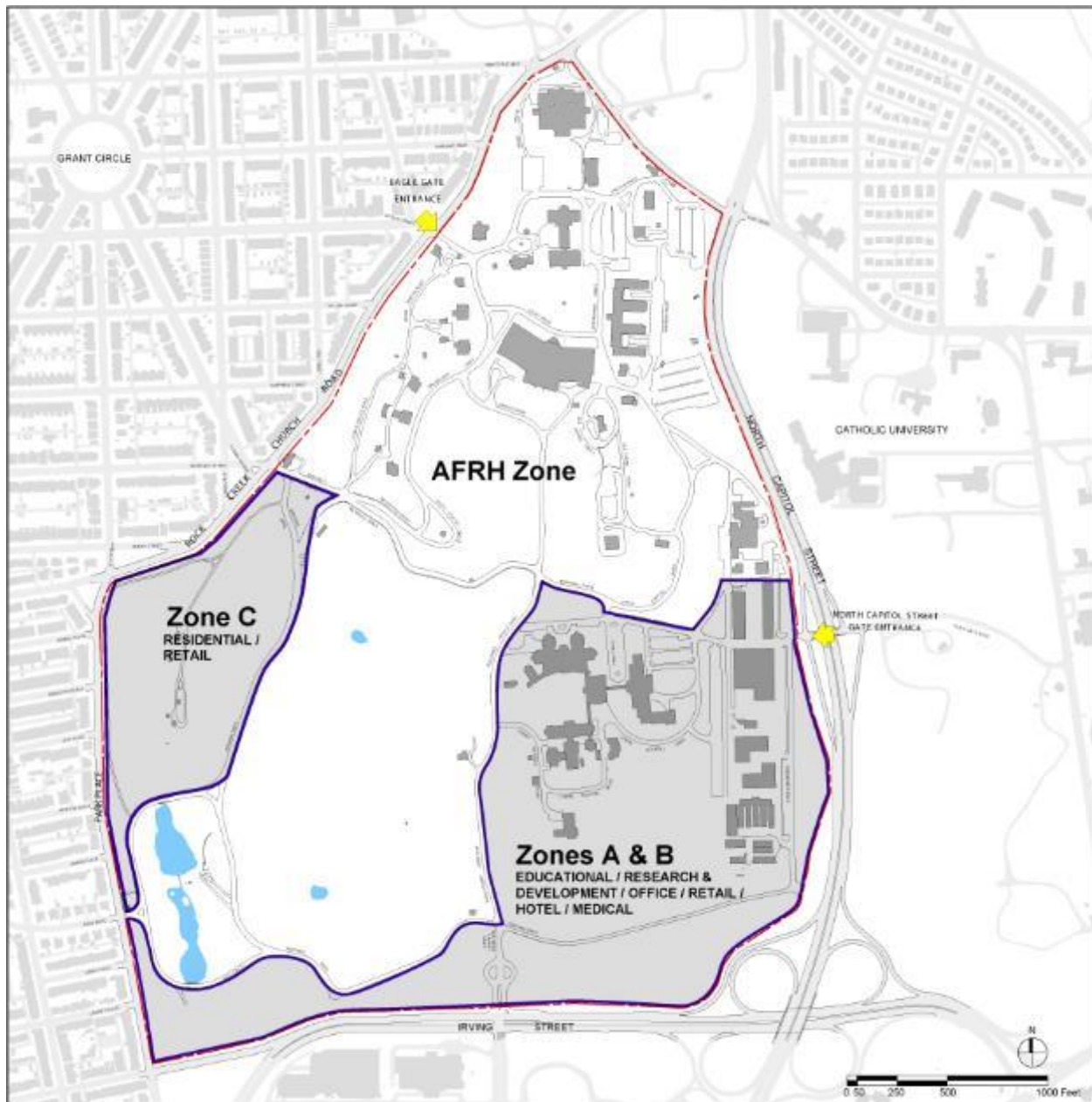


Figure 2-1: 2007 Final EIS Alternative 2 Development Zones

2007 Final EIS Alternatives 3B and 3C

Alternatives 3B and 3C, as studied in the 2007 Final EIS, provided options for development of the individual zones on AFRH-W. In these alternatives, Zone A represents development proposals received in response to the August 2006 Request for Proposals. A summary of the development under each of these scenarios is shown in Table 2-3. Figure 2-2 delineates the distribution of development uses under Alternatives 3B and 3C on the four AFRH-W development zones.

Table 2-3: 2007 Final EIS Alternative 3B and 3C Proposed Development

2007 Proposed Development	Gross Square Footage	
	Alternative 3B	Alternative 3C
Institutional	392,000	392,000
Residential	4,781,819	4,189,331
Hotel/Conference Center	220,000	200,000
Retail	241,735	470,763
Medical	250,000	0
Office/Research and Development	692,000	1,688,600
TOTAL	6,535,554	6,898,694

Under these alternatives:

- The AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within this zone. In addition, several holes on the golf course would be relocated. All alterations to the golf course would occur within the footprint of the current golf course.
- Zone A is designated for residential, office/research and development, retail, hotel, and medical uses.
- Zones B and C are designated for residential development which would take place at a later time.

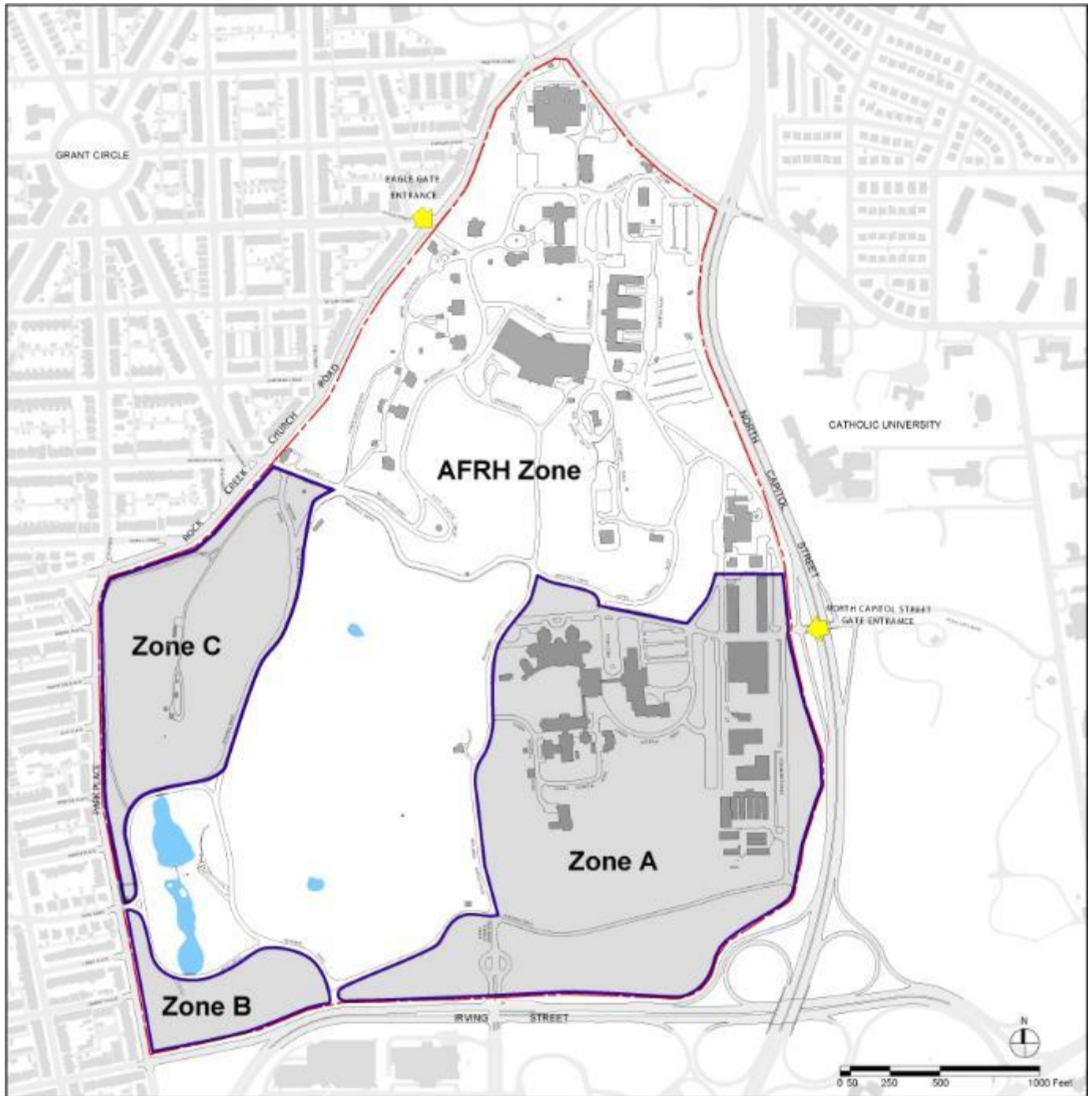


Figure 2-2: 2007 Final EIS Alternative 3 Development Zones

2007 Final EIS Alternative 4

Under Alternative 4, as studied in the 2007 Final EIS, AFRH-W would have been developed to accommodate the development outlined in Table 2-4. This alternative was proposed to examine a program that is primarily residential, without a substantial component for medical or research and development related uses.

Table 2-4: 2007 Final EIS Alternative 4 Proposed Development

Proposed Development	Gross Square Footage
Institutional	350,000
Residential	4,967,000
Retail	300,000
Office	700,000
TOTAL	6,317,000

Figure 2-3 delineates the distribution of development uses under Alternative 4 on the four AFRH-W development zones. Under this alternative:

- The AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within this Zone.
- Zones A and B would be developed with residential, office, and retail uses.
- Zone C would contain residential development.



Figure 2-3: 2007 Final EIS Alternative 4 Development Zones

2.3 Summary of Impacts

The following table (Table 2-5) provides a comparison of impacts between the No Action and Master Plan Alternative. Detailed information on impacts is located in *Chapter 3, Affected Environment and Impacts to the Human Environment*.

Table 2-5: Summary of Impacts

Resource Topic	No Action Alternative	Master Plan Alternative
Stormwater Management	No direct, indirect or cumulative impacts would occur.	Construction activities and the permanent increase in impervious surface from the development of Zone A would result in direct, short and long-term, adverse impacts.
Greenhouse Gases and Climate Change	No direct, indirect or cumulative impacts would occur.	Implementation of the AFRH-W Master Plan and related construction activities would have direct, short and long-term adverse impacts on GHGs and climate change. Indirect, long-term, adverse impacts would result from an increase in electricity use after the proposed development is complete.
Land Use, Planning, & Zoning Office	No direct, indirect or cumulative impacts would occur.	Implementation of AFRH-W Master Plan could serve as a catalyst for further development in the surrounding area, which could involve changes in land use or zoning. Therefore, an indirect, long-term, minor, beneficial impact could occur.
Traffic and Transportation	Baseline development and growth would result in a major, long-term, adverse impact.	The Master Plan Alternative would result in major, long-term, adverse impacts to traffic in the area. There would also be direct and indirect, major, long-term, adverse impacts to the areas transit systems.
Environmental Contamination	No direct, indirect or cumulative impacts would occur.	The removal of hazardous waste and contaminants in the buildings and on the site would have a direct, long-term, minor, beneficial impact.

3.0 Affected Environment and Impacts to the Human Environment

3.1 Affected Environment and Impact Assessment Methodology

This chapter of the SEIS describes the existing conditions of the human environment at AFRH-W and the impacts the implementation of the Master Plan would have on the site. The implementation of the Master Plan would have varying impacts to natural resources, the social and economic environment, historic resources, and infrastructure (the transportation network and utilities).

Impacts can occur from construction as well as operations of the AFRH-W redevelopment. Impacts can also occur both directly on the site of AFRH-W as well as off-site (for instance, employees commuting to the new mixed-used development would affect existing traffic on nearby roads). Cumulative impacts from the implementation of the Master Plan, when added to other past, present, and future projects in the area, are further discussed at the end of this chapter.

The effects on the human environment were assessed using best available scientific studies, guidance documents, and information. Resources used to analyze the impacts were obtained from federal, state, and local agencies. These include, but are not limited to, the following:

- U.S. Environmental Protection Agency (EPA) analyses and reports
- U.S. Department of Agriculture (USDA) NRCS Soil Surveys
- Federal Emergency Management Agency (FEMA) Floodplain Maps
- U.S. Army Corps of Engineers (ACOE) wetland manuals
- U.S. Fish and Wildlife Service (FWS) threatened and endangered species lists and National Wetland Inventory (NWI) maps
- Federal Highway Administration (FHWA) traffic guidance
- Environmental Site Assessments (ESAs)
- DC Historic Preservation Office (HPO)
- DC Department of Energy and Environment (DOEE) erosion and sediment control and stormwater design manuals
- Metropolitan Washington Council of Government (MWCOG) reports

A complete list of references is included at the end of this SEIS. For resources that required additional analysis, methodologies are summarized later in Chapter 3.

3.2 Topics Dismissed from Further Analysis

As with any environmental analysis, there are resource issues that are dismissed from further analysis because the proposed action would cause a negligible or no impact. Negligible impacts are effects that are localized and immeasurable at the lowest level of detection. Therefore, these topics are briefly discussed and then dismissed from further consideration or analysis. These resources are:

- Geology, Topography, and Soils
- Water Resources
 - Groundwater, Hydrology, and Quality

- Surface Water and Wetlands
- Floodplains
- Coastal Zone Management
- Biological Resources
 - Terrestrial and Aquatic Biota
 - Threatened and Endangered Species
- Social Environment
 - Population and Housing
 - Environmental Justice
 - Community Facilities and Services
 - Economy, Employment, and Income
 - Taxes and Revenue
- Cultural Resources
 - Historic Properties
 - Archeological Resources
- Air Quality
- Noise
- Utilities
 - Water Service
 - Sanitary Sewer
 - Electric Service
 - Natural Gas Service
 - Communication Service
 - Solid Waste

3.2.1 Geology, Topography, and Soils

As discussed in the 2007 Final EIS, clearing, grading, and construction activities would permanently alter 23.4 acres of land, which is roughly 9 percent of the 272-acre project area. The topography and soils in the project area, including open spaces and recreational fields, were drastically altered in the late twentieth century by the construction of the AFRH and adjacent projects such as the Washington Hospital Complex, the Veterans Administration Hospital, and Irving Street (AFRH Master Plan 2008). A detailed erosion and sedimentation control plan would be developed prior to construction, based on the requirements of the Watershed Protection Division of the DC Department of Energy and Environment (DOEE). Development of this plan would ensure that appropriate measures are enacted during construction to minimize soil erosion.

There are no changes to the impacts described in the 2007 Final EIS. Therefore, topography and soils have been dismissed from further analysis in this SEIS.

3.2.2 Water Resources

Groundwater Hydrology and Quality

The 2007 Final EIS concluded that there would be no direct impacts to groundwater hydrology or quality. The proposed development would result in an increase in impervious surface. Because the region within the watershed is entirely urbanized, the increase in impervious surfaces from the proposed development at AFRH-W would be negligible. In addition, a large amount of pervious vegetated surface, particularly in the region of the golf course at AFRH-W, would be avoided and preserved, allowing for groundwater recharge.

There are no changes to the impacts described in the 2007 Final EIS. Therefore, groundwater hydrology and quality has been dismissed from further analysis.

Surface Water and Wetlands

The 2007 Final EIS identified two fishing ponds located in the southwest corner of AFRH-W and two small ponds (the Lakes) located on the golf course. A stormwater retention pond was built in 1974 to provide stormwater management for the LaGarde Building. During a meeting at AFRH-W with the U.S. Army Corps of Engineers (USACE) on June 12, 2007, the USACE mentioned that it may assert jurisdiction over portions (approximately 20 feet) of the concrete-lined channels to the north and south of the recreational fishing ponds, as well as the stormwater management pond.

As discussed in the 2007 Final EIS, surface water features on the AFRH-W site may be directly affected. Concrete channelized streams may need to be diverted or relocated. The stormwater management pond located adjacent to Pershing Drive may be affected. In the event that the USACE or District government assert jurisdiction over the affected concrete channels or the stormwater management pond, a permit from the USACE Baltimore District pursuant to Section 404 (b) (1) guidelines of the Clean Water Act would be required. No construction is proposed in the region of the fishing ponds or the golf course. No other wetland areas would be impacted by the implementation of the Master Plan. Best Management Practices (BMPs) would be utilized to mitigate indirect and cumulative impacts to wetlands associated with the proposed action.

There are no changes to the impacts described in the 2007 Final EIS. Therefore, surface water and wetlands have been dismissed from further analysis.

Floodplains

According to the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency, the site does not fall within a 100-year floodplain (FEMA 1985).

Because there are no floodplains located within the AFRH-W campus, floodplains have been dismissed from further analysis.

Coastal Zone Management

The District of Columbia has no designated Coastal Zone, nor has it developed a Coastal Zone Management Plan under the Coastal Zone Management Act (16 U.S.C. Section § 1451, et seq., as amended).

Because the District is not subject to the Coastal Zone Management Act, coastal zone management has been dismissed from further analysis.

3.2.3 Biological Resources

Terrestrial and Aquatic Biota

The 2007 Final EIS concluded that wildlife species would only be temporarily affected by construction noise and activities as a result of the implementation of the Master Plan. A loss of forested areas and open spaces would occur; however, most of the existing green space and forested areas would be maintained and preserved, providing adequate habitat for wildlife. Construction activities could result in increased stormwater runoff, sedimentation, and pollutants in the stocked fishing ponds. However, these increases would only be temporary. During construction, the developer would be required to adhere to a Landscape Plan that would minimize impacts to forested areas and critical root zones and require revegetation of removed or damaged vegetation. Onsite stormwater management controls would be implemented to reduce indirect impacts to the stocked fishing ponds and drainage.

There are no changes to the impacts described in the 2007 Final EIS. Therefore, no further analysis is necessary and terrestrial and aquatic biota has been dismissed from further analysis.

Threatened and Endangered Species

According to the USFWS, there are no known federally proposed or listed endangered or threatened species within the project area (USFWS 2016).

Because no known listed threatened or endangered species would be impacted by the development proposed in the Master Plan, threatened and endangered species has been dismissed from further analysis.

3.2.4 Social Environment

Population and Housing

In the 2007 Final EIS, population data from the 2000 Census was used to determine population, housing, race, ethnicity, income, and employment characteristics. Due to the length of time that has passed, these analyses were updated using the most recent data from American Community Survey (ACS).

A total of six census tracts are included in the study area. AFRH-W is located within 2010 Census Tract 23.02. Census tracts immediately adjacent to AFRH-W include Tracts 22.02, 23.01, 24, 32, and 95.01 (see Figure 3-1). Table 3-1 below provides a summary of the demographic characteristics for all these census tracts.

The 2011-2015 ACS 5-Year Estimates indicate that the predominant race in Census Tract 23.02, where AFRH-W is located, is black (47.5 percent). All other census tracts in the study area are also predominantly black, ranging from 52 to 64 percent. Census Tract 22.02 has the highest percentage of black residents (64.3 percent). Tract 23.02, where AFRH-W is located, has the highest Asian population of all the census tracts (approximately 6 percent). The other tracts range from 1.6 to 3.7 percent Asian residents, which are all lower than or equal to the District percentage (3.7 percent). Approximately 4.7 percent of Census Tract 23.02 is recorded in the Census as some other race. The other five census tracts

range from 7.6 to 24.3 percent recorded as some other race. The percentage of the population recorded as two or more races was highest in Tract 23.01 (5.6 percent), followed by Tract 95.01 (4.4 percent) and Tract 24 (3.8 percent). All other tracts had a lower percentage multiracial population than the District (2.7 percent), ranging from 0.8 to 2.3 percent. All census tracts are less than 1 percent American Indian or Hawaiian.

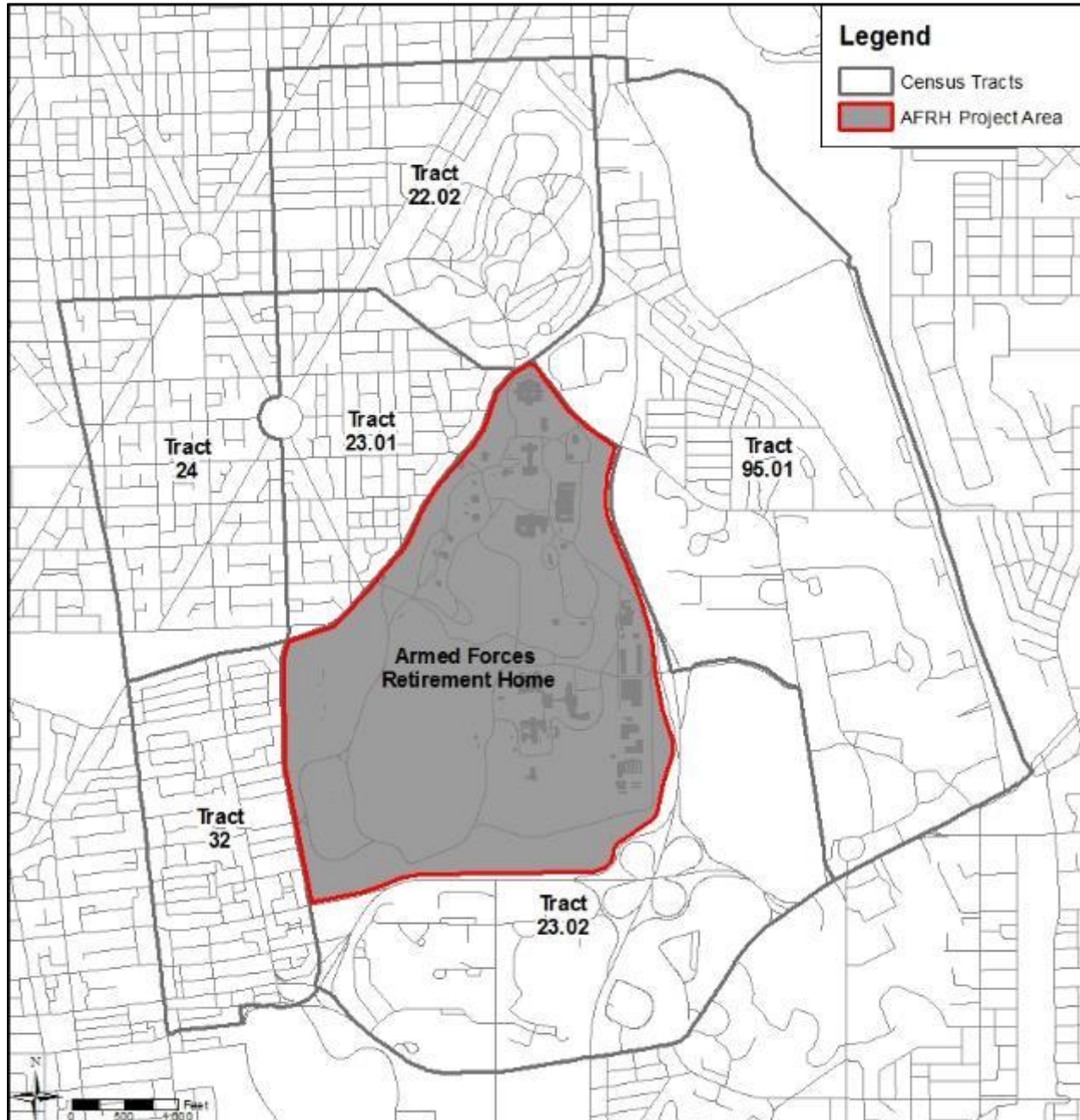


Figure 3-1. Study Area Census Tracts

Table 3-1: Study Area Demographics

Demographic	Washington DC	Census Tract 23.02	Census Tract 22.02	Census Tract 23.01	Census Tract 24	Census Tract 32	Census Tract 95.01
Population	647,484	1,711	3,947	3,220	4,275	4,997	7,088
Race							
White	40.2%	39.1%	7.3%	24.2%	24.3%	36.4%	27.1%
Black	48.9%	47.5%	64.3%	53.3%	53.9%	51.5%	53.7%
American Indian	0.3%	0.0%	0.2%	0.0%	0.5%	0.0%	0.2%
Asian	3.7%	6.1%	1.6%	2.2%	2.5%	3.7%	2.1%
Native Hawaiian	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other Race	4.2%	4.7%	24.3%	12.6%	15.0%	7.6%	12.4%
Two or More Races	2.7%	2.6%	2.3%	5.6%	3.8%	0.8%	4.4%
Hispanic/Latino	10.2%	3.6%	27.6%	15.2%	23.2%	28.1%	21.7%
Median Household Income	\$85,301	\$59,630	\$48,274	\$97,500	\$94,395	\$90,313	\$47,679
Poverty Level	18.0%	23.9%	26.4%	10.5%	7.8%	16.3%	23.1%

Source: 2011-2015 American Community Survey 5-Year Estimates

Census Tract 23.02, where AFRH-W is located, has the lowest percentage of Hispanic or Latino residents at approximately 3.6 percent, which is lower than the District as a whole (10.2 percent). Census Tract 32 has the highest percentage at approximately 28 percent. All census tracts in the study area, except Tract 23.02, have a higher percentage of Hispanic or Latino residents than the District as a whole, ranging from 15.2 to 28.1 percent.

The median household income for Census Tract 23.02 is \$59,630, lower than that of the District (\$85,301). The median incomes in Tracts 22.02 and 95.01 are also lower than that of the District. Tracts 23.01, 24, and 32 have a higher median household income than the District. The percentage of individuals living below the poverty level in the study area is higher in Census Tracts 23.02, 22.02, and 95.01 than in the District as a whole and is slightly lower in Tracts 23.01, 24, and 32. Housing characteristics for the census tracts within the study area were obtained from 2011-2015 ACS 5-Year Estimates (Table 3-2).

Table 3-2: Housing Characteristics

	Washington DC	Census Tract 23.02	Census Tract 22.02	Census Tract 23.01	Census Tract 24	Census Tract 32	Census Tract 95.01
Number of Housing Units	303,312	1,105	1,473	1,196	1,477	1,906	1,961
Percent Vacant	9.9%	26.2%	10.9%	8.5%	8.5%	12.6%	6.6%
Percent Occupied	90.1%	73.8%	89.1%	91.5%	91.5%	87.4%	93.4%
Percent Owned	41.2%	20.5%	43.7%	74.5%	63.3%	55.3%	20.0%
Percent Rented	58.8%	79.5%	56.3%	25.5%	36.7%	44.7%	80.0%

Source: 2011-2015 American Community Survey 5-Year Estimates

AFRH-W continues to house approximately 600 retired military personnel.

As described in the 2007 Final EIS, the Master Plan would result in a population increase of 6,000 individuals relocating to new housing units. The developer would construct affordable housing units as part of the development of parcels that include residential apartments and condominiums. Fifteen percent of the units would be available and affordable to households earning, as a maximum, between 60 and 80 percent of the Area Median Income. The affordable units would be the same size as the market-rate units for the unit type (i.e. one, two, and three bedroom units). The mix of unit types for affordable housing would be 60 percent one-bedroom, 30 percent two-bedroom, and 10 percent three-bedroom. In addition, the Master Plan proposes a 100-bed facility for veterans in transition from homelessness. The 2007 Final EIS concluded that new residential development and an increase in affordable housing, both proposed in the Master Plan, would be beneficial to the DC area by increasing the types, value, and availability of housing in the region.

It is not anticipated that employees of the proposed commercial and institutional uses would relocate closer to AFRH-W. Normal trends in DC's population and housing stock are anticipated to occur whether or not the Master Plan is implemented.

The proposed increase in residential development and the increase in affordable housing would not change from the 2007 Final EIS. Therefore, population and housing has been dismissed from further analysis.

Environmental Justice

Due to the amount of time that has passed since the 2007 Final EIS was completed, it was necessary to reevaluate the effects to low-income and minority populations based on the most recent ACS 5-Year Estimates data.

Executive Order (EO) 12898 directs federal agencies to identify and address as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. A minority population is defined as any census tract within the study area that has a higher percentage of nonwhite residents and/or Hispanic or Latino residents than the District of Columbia as a whole. A low-income population is defined as any census tract within the study area that has a higher percentage of residents living below the federal poverty level than the District as a whole.

As shown in Table 3-1, the predominant race in all census tracts in the study area is black, and all tracts have a higher percentage of nonwhite residents than the District as a whole. All census tracts in the study area, except Tract 23.02, have a higher percentage of Hispanic or Latino residents than the District as a whole, ranging from 15.2 to 28.1 percent. Therefore, all census tracts in the study area are considered minority populations. The minority population in Tract 95.01 was not previously accounted for in the 2007 Final EIS.

The percentage of individuals living below the poverty level in the study area is higher in Census Tracts 23.02, 22.02, and 95.01 than in the District as a whole and is slightly lower in Tracts 23.01, 24, and 32. Therefore, Tracts 23.02, 22.02, and 95.01 are considered low-income populations. The low-income population in Tract 95.01 was not previously accounted for in the 2007 Final EIS.

Based on the analysis conducted for the 2007 Final EIS, there would be no disproportionately high or adverse impacts on minority or low-income populations. Impacts to minority and low-income populations would not differ from impacts to the population as a whole. In addition, the creation of affordable housing and transitional housing for homeless veterans would be beneficial to low-income populations.

Even with the addition of Census Tract 95.01, no changes to the Master Plan have been proposed that would disproportionately affect any minority or low-income populations. Therefore, environmental justice has been dismissed from further analysis.

Community Facilities and Services

The 2007 Final EIS concluded that the increase in building density and number of occupants may increase demand for police, fire, and emergency services and schools. The increase in demand is not expected to exceed the capacity of existing providers. Existing community services such as libraries, social services organizations, community organizations, and churches would likely benefit from the increase in tax base and local population caused by the development of AFRH-W. The public would also benefit from the creation of publicly accessible bicycle paths, pedestrian paths, two pocket parks, two large open meadows, and a green buffer around the entire perimeter of the project area. No changes to the 2007 Master Plan have been proposed that would alter the effects to these facilities and services. Therefore, no further analysis of Community Facilities and Services is necessary in this SEIS.

Economy, Employment, and Income

Due to the amount of time that has passed since the 2007 Final EIS was completed, the economy, employment, and income data has been reevaluated based on the most recent ACS 5-Year Estimates data.

According to the 2011-2015 ACS 5-Year Estimates, 60.9 percent of working residents in the District of Columbia are in management, business, science, and arts occupations. Sales and office occupations follow at 17.4 percent and service occupations at 15.2 percent. Of the working population in the District, natural resources, construction, and maintenance occupations employ 2.9 percent and Production, transportation, and material moving occupations employ 3.7 percent.

The professional, scientific, management, administrative and waste management services industries employ the highest percentage of the working population in the study area (22.7 percent). The educational, health, and social services industries employ the second-highest percentage of the working population at 19.5 percent. Public administration employs the third-highest at 16.7 percent of the working population, followed by arts, entertainment, recreation, accommodation, and food services (9.4 percent); finance, insurance, real estate, rental and leasing (5.8 percent); retail (4.9 percent); information (4 percent); construction (3 percent); transportation, warehousing, and utilities (3 percent); and manufacturing, wholesale trade, and agriculture/forestry/hunting/mining, which each employ less than two percent of the working population. A total of 9 percent of the working population is employed by other industries not listed above.

Major employers in the vicinity of the project area include the VA, MedStar, Catholic University, Howard University, and AFRH-W itself.

As of January 2016, the District of Columbia's unemployment rate is 6.5 percent, which is higher than the national average of 4.7 percent (BLS 2016). The median household income is \$85,301, compared to the national average of \$53,482 (ACS 5-Year Estimates 2015).

The 2007 Final EIS concluded that the implementation of the Master Plan could result in an increase of up to 6,000 employees on AFRH-W property due to the additional office, research and development, institutional, retail, hotel, and medical uses. In addition, construction activities would lead to the purchase of building materials, construction supplies and construction equipment, as well as spending by the construction workers, which would add income to the economy. The developer of Zone A and all subcontractors, professional service providers, and suppliers of goods and services for the project would provide business opportunities for small, disadvantaged, women-owned, veteran-owned and service disabled veteran-owned small businesses. The Zone A developer would also promote the growth of skilled craft labor by supporting the use of registered apprenticeship programs. Overall, the 2007 Final EIS concluded that the increases in employment would benefit the economy and employment rates in the region.

The proposed increase in residential development and subsequent economic impacts would not change from the 2007 Final EIS. Therefore, no further analysis of economy, employment or income is necessary for this SEIS.

Taxes and Revenue

As stated in the 2007 Final EIS, the implementation of the Master Plan would result in new revenues generated through the sale or lease of land on AFRH-W, which would replenish the AFRH Trust Fund. As a Federal government agency, AFRH would not directly contribute property tax revenues to the District of Columbia. Taxes would be levied upon a private developer holding a ground-lease interest granted by AFRH for a non-tax-exempt use, in accordance with DC Code Section 47-1005.01. As a result, the District of Columbia would receive new revenues from taxes assessed based on the value of improvements on the real property if a lease, and on the land and improvements if a sale. Taxes would be in accordance with the tax status of the lessee or user.

In addition, the presence of AFRH in the District would bring the benefit of tax revenue from any resident employee, as well as local commercial entities that do business with AFRH. Personal property taxes and income taxes would provide direct, long-term, moderate, beneficial impacts to the city.

Increased sales transactions for the purchase of materials and supplies would generate some additional revenues for the local government. If some of the construction workers used for the project are not currently employed, the amount of additional revenue generated through income taxes on worker earnings would increase. These impacts would be direct, short-term, minor, and beneficial.

The proposed increase in residential development and the potential increase in tax revenue would not change from the 2007 Final EIS. Therefore, no further analysis of taxes and revenue is necessary for this SEIS.

3.2.5 Cultural Resources

Historic Properties

Since 2007, the entirety of the AFRH-W campus was listed in the National Register of Historic Places (NRHP) and the District of Columbia Inventory of Historic Sites (DC Inventory) as a historic district (AFRH-W Historic District or district). The 2007 Final EIS treats the campus as an eligible historic district, and the analysis of potential impacts is based on the documentation and evaluation that serves as the basis for the district's NRHP nomination. No changes to the conditions of the campus since 2007 have affected the historic integrity or the eligibility of the AFRH-W Historic District as described in the 2007 Final EIS, although changes in conditions may have affected individual resources within the district.

Developments approved since 2007 for sites outside the AFRH-W boundaries may affect viewsheds that contribute to the significance of the AFRH-W Historic District. Specifically, new construction associated with the redevelopment of the McMillan Slow Sand Filtration Plant, located to the south of AFRH-W, may encroach on the historic viewshed from the Scott Statue (Building 63) to the U.S. Capitol Building. Views studies submitted as part of the public record during the local and federal design and zoning reviews for the project indicate that the buildings constructed on the north side of the site will be visible from both the Scott Statue and from the U.S. Soldiers' and Airmen's Home National Historic Landmark. Construction on the McMillan site is underway.

In 2012, AFRH demolished the 1950s Scott Building (Building 80) and constructed a smaller building in its place. The new building was designed and sited to reopen the historic viewshed from the Lincoln Cottage (Building 12) south through campus to the U.S. Capitol Building. The HPP shows this viewshed as

compromised by the eight-story Scott Building, and the change in conditions since the HPP was finalized in 2007 may change the integrity and status of this viewshed as a historic resource within the district.

As an amendment to the originally proposed redevelopment of Zone A, AFRH now proposes the redevelopment of the Heating Plant (Building 46) and surrounding site, including the Storage Contamination Building (Building 69, Contributing), and Support Directorate Building (Building 70, Non-Contributing). This redevelopment will not introduce new square footage to the historic district and would result in the adaptive use of the Contributing resources and the demolition of the Non-Contributing resources, consistent with the scope of the preferred alternative assessed in the 2007 Final EIS. In 2015, AFRH completed Section 106 review of the ground lease and reuse of these resources by a private developer (Undertaking Review Request #40), and the District of Columbia State Historic Preservation Officer (DC SHPO) concurred that the action would have no adverse effects on the AFRH-W Historic District or its historic resources as long as the ground lease requires that the reuse be consistent with the historic preservation standards and guidelines established by the AFRH-W Historic Preservation Plan (2007) and Programmatic Agreement (2008). Therefore, this change to the proposed action does not require additional assessment for potential impacts to historic resources.

Archeological Resources

A Phase 1A Archeological Assessment was conducted on AFRH-W in October 2004 in preparation for the 2007 Final EIS. The study consisted of background research including review of the archaeological and historical site files of the DC SHPO, soil surveys of the U.S. Department of Agriculture (USDA), as well as local cultural resource management reports and the National Register of Historic Places (NRHP). Additional research was conducted at the National Archives in Washington, where relevant historic documents including maps and published histories were examined and incorporated in the Phase 1A Archeological Assessment.

The 2004 Phase IA archaeological assessment of AFRH-W was revised by a subsequent Phase IA assessment conducted in 2014. This assessment used a GIS-based approach with limited field verification. Stantec conducted background research, a cut and fill (elevation change) analysis, an analysis of prior impacts, and a review of historical maps for 11 survey areas within the AFRH-W campus. The probability for archaeological resources was identified for each survey area and shovel test pits were excavated to ground-truth the probability analysis. Based on the results of the ground-truthing shovel test pits, areas of resource potential were modified to better reflect the existing potential for the presence of archaeological resources. The 2014 Phase IA assessment identified areas of archaeological resource potential and the most effective methods to conduct future field testing. For future undertakings at AFRH-W, this assessment provides AFRH property managers and DC SHPO archaeologists with a basis to further refine project scopes and to make a determination as to whether additional archaeological field investigations are required. Procedures for evaluating ground-disturbing undertakings at AFRH-W are suggested in this assessment.

In 2007, at the request of the DC SHPO, AFRH developed a Historic Preservation Plan to guide development on AFRH-W. The document ensures AFRH's compliance with Section 106 and Section 110 of the NHPA which require federal agencies to take certain actions to protect historic resources under their control. No changes to the Master Plan have been proposed that would increase the likelihood of discovering or disturbing archaeological resources. Therefore, no further analysis of archaeological resources is necessary for this SEIS.

3.2.6 Air Quality

At the time of the 2007 Final EIS, Washington, DC was in nonattainment for both ozone and PM_{2.5}. As of 2013, the DC area was redesignated to be in attainment for PM_{2.5} but remains in nonattainment for ozone (MWCOG 2013; DOEE 2016a).

The 2007 Final EIS concluded that additional site development at AFRH-W under the Master Plan Alternatives would increase energy demands. Modifications to existing systems, primarily increased boiler capacity, would be required to accommodate this demand, which would increase air emissions. The 2007 Final EIS found that mobile sources of air toxics under the Master Plan would not exceed the National Ambient Air Quality Standards (NAAQS) for carbon monoxide. The implementation of the Master Plan would not require an individual Non-Attainment Area (NAA) permit for NO_x emissions. However, the Plan would exceed the annual *de minimis* threshold for nitrous oxide (NO_x), a precursor to ozone, and therefore would require a formal general conformity determination under the Clean Air Act. The 2007 Final EIS also described several mitigation options that could potentially reduce NO_x emissions to below the *de minimis* threshold, eliminating the need for a conformity determination. These mitigation options would continue to be implemented under the proposed action.

The 2007 Final EIS also determined that air quality may be temporarily impacted by fugitive dust and emissions as a result of construction activities over a 10-year period. However, the intensity, duration, location, and type of construction activity would vary over time. Short term construction impacts can be mitigated through the use of proper control measures including maintenance of emission controls on all construction equipment and covering/wetting exposed soils to reduce fugitive dust. Developers would be required to submit a construction management plan including plans to mitigate impacts to air quality during construction.

No changes to the Master Plan that would affect air quality or emissions have been proposed. Therefore, no further analysis of air quality is necessary in this SEIS.

3.2.7 Noise

The 2007 Final EIS concluded that the implementation of the Master Plan would alter traffic volumes and patterns, but would not result in excessive noise increases to noise-sensitive areas. Temporary construction noise is unavoidable, but the extent and severity of the noise impact would depend upon the noise characteristics of the construction equipment in use and the time of day that construction takes place. Mitigation measures will be developed and enforced through transaction documents between AFRH-W and the developer through a construction management plan, which would include noise reduction measures.

No changes to the Master Plan have been proposed that would increase noise to sensitive receptors. Therefore, no further analysis of noise impacts is necessary for this SEIS.

3.2.8 Utilities

Water Service

The 2007 Final EIS concluded that the DC Water and Sewer Authority (DC Water) has adequate capacity to meet the water demand requirements of the Master Plan implementation. The water distribution

system on AFRH-W would be designed to ensure adequate capacity to supply the average and peak hourly demands of the buildings on-site. The proposed project would require new water transmission lines and easements, which would be designed and permitted according to DC Water's requirements.

No changes to the water service requirements of the AFRH-W Master Plan have been proposed. Therefore, no further analysis is necessary for this SEIS.

Sanitary Sewer

The 2007 Final EIS concluded that the increase in service requirements as a result of the Master Plan implementation would contribute to the existing problems caused by the combined sewer system in the District. The Master Plan would require the installation of additional sanitary sewer lines and the acquisition of subsequent easements by DC Water. The adverse effects could be mitigated through the use of low-flow faucets, toilets, and shower heads. A water conservation plan could also be prepared and implemented.

No changes to the sewer service requirements of the AFRH-W Master Plan have been proposed. Therefore, no further analysis is necessary for this SEIS.

Electric Service

The Potomac Electric Power Company, Inc. (PEPCO) is the only distributor of electricity in the District of Columbia metropolitan area. The 2007 Final EIS concluded that the level of service that would be required following the Master Plan implementation is substantially higher than current power usage at the site. Implementation of the Master Plan would require the extension of electrical power lines from existing on-site or adjacent services to new buildings and support facilities (e.g., parking areas), and new transformers within the site. In addition, the existing PEPCO vault would need to be expanded to accommodate the new electric services required from the project development. Some manholes and service lines may need to be relocated or removed. Easements may be needed to provide access for PEPCO-owned lines and equipment. The relocation of and connection to power lines would be completed with the least amount of disruption possible to current users, although some traffic disruptions may occur. Energy conservation measures could be incorporated into building design to mitigate impacts related to power systems.

Since the Master Plan was completed in 2008, the Heating Plant has been decommissioned, and the parcel is now included in the Zone A redevelopment area. If this parcel is developed, some existing service lines may need to be relocated. Rights-of-way or easements for existing service lines would be established on the developed parcel. No other changes to the electric service requirements of the AFRH-W Master Plan have been proposed. Therefore, no further analysis of electrical service is necessary in this SEIS.

Natural Gas Service

Washington Gas supplies natural gas to the District of Columbia. Natural gas lines run throughout the developed portions of AFRH-W property. The 2007 Final EIS concluded that the level of service that would be required following the Master Plan implementation is substantially higher than current natural gas usage at the site. Implementation of AFRH-W Master Plan would require the extension of gas lines from existing on-site or adjacent services to new buildings. The relocation of and connection to gas lines would be completed with the least amount of disruption possible to current users, although some traffic

disruptions may occur. Energy conservation measures would be incorporated into building design to mitigate impacts related to fuel and power systems.

Since the Master Plan was completed in 2008, the Heating Plant has been decommissioned, and the parcel is now included in the Zone A redevelopment area. Three steam boilers in the Heating Plant were previously fueled by natural gas. The functions of the Heating Plant have been replaced with more efficient individual boilers for each active building on campus, potentially reducing the number of additional gas lines and connections required. Since the changes to the natural gas service requirements of the AFRH-W Master Plan are expected to be minimal and beneficial, no further analysis of natural gas service is necessary in this SEIS.

Communication Service

Telephone service to AFRH-W is provided by Verizon Telephone Company. The 2007 Final EIS concluded that Verizon is expected to be able to meet the demands of the AFRH-W following the implementation of the Master Plan. The project would require the extension of communication lines for data and communication systems. The relocation of and connection to communications lines would be completed with the least amount of disruption possible to current users, although some traffic disruptions may occur. Fiber optic technology could be used as much as possible to minimize the size and number of cables that would need to be constructed.

No changes to the communication service requirements of the AFRH-W Master Plan have been proposed. Therefore, no further analysis of communication service is necessary in this SEIS.

Solid Waste

During operation of the buildings on-site, solid and medical waste would be generated. Commercial trash generators are required by law to separate recyclable refuse and deliver these materials to a recycling center. Private hauling services would dispose of the solid waste generated on-site. All bio-medical waste would be collected and picked up by a service contractor for off-site disposal in accordance with DCMR Title 21.

The volume of solid waste disposed of from the site would temporarily increase during construction due to demolition of buildings on the property and disposal of construction materials.

Recycling programs would be implemented in accordance with DC Solid Waste Management and Multi-Material Recycling Act of 1988 (Chapter 20, Title 21 § 2000 et. Seq.) and Executive Order 13101: Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition.

No changes to the amount of waste generated as a result of the AFRH-W Master Plan are proposed. Therefore, no further analysis of solid waste is necessary in this SEIS.

3.3 Topics Retained for Further Analysis

As with any environmental analysis, there are resource issues that are analyzed in further detail to compare the environmental consequences of the No Action and the Master Plan Alternative. Both alternatives described in Chapter 2 would have varying impacts to natural resources, the social and economic environment, and infrastructure. The resources analyzed in detail in this SEIS are:

- Stormwater Management

- Greenhouse Gases and Climate Change
- Land Use Planning and Zoning
- Transportation
- Environmental Contamination

3.4 Stormwater Management

When the Master Plan was approved in 2008, the water quality management strategies proposed were in compliance with the DC Storm Water Management Regulations (DCMR Title 21, Chapter 5) established in 1988. However, on July 19, 2013, the District of Columbia Department of Energy and Environment (DOEE) released the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control (2013 stormwater rule; DDOE 2013), which amended 21 DCMR 5. The District also adopted a new Stormwater Management Guidebook (SWMG; DDOE/CWP 2013), incorporated herein by reference, which superseded an earlier 2003 version of the guidebook. Due to the change in stormwater regulations, the stormwater management strategies proposed in the 2008 Master Plan must be reevaluated in this SEIS to ensure compliance with the new rule.

The 1988 regulations and the 2003 SWMG emphasize the detention and treatment of the first 0.5 inches of stormwater runoff, often known as the “first flush,” that carries 85 to 90 percent of the total surface pollutants found in stormwater. In addition to the “first flush” treatment, the 2003 guide also requires stormwater quantity controls that limit stormwater discharge to pre-development flows. The new 2013 stormwater rule emphasizes on-site volume retention, which can be managed through runoff prevention (e.g., conservation of pervious cover or reforestation), runoff reduction (e.g., infiltration or water reuse), and runoff treatment (e.g., plant/soil filter systems or permeable pavement). By retaining stormwater on site, retention practices effectively provide both water quality treatment and additional volume control, significantly improving protection for District waterbodies. According to the new rule, regulated sites that undergo a major land-disturbing activity or a major substantial improvement activity must employ Best Management Practices (BMPs) and post-development land cover necessary to achieve the stormwater retention volume (SWRV) equal to the post-development runoff from the applicable rainfall event, as measured for a 24-hour storm with a 72-hour antecedent dry period. Since the implementation of the Master Plan would be considered a major land-disturbing activity, the applicable rainfall event for the AFRH-W area is 1.2 inches. In summary, under the 2013 stormwater rule, major land-disturbing activities such as the AFRH-W Master Plan must be designed to retain on-site a minimum of 50 percent of all rainfall up to a 1.2-inch storm event. The remaining volume retention can be accomplished using off-site retention, if necessary.

All major regulated projects are required to submit a Stormwater Management Plan (SWMP) in accordance with the amended 21 DCMR 5 and the details outlined within the 2013 SWMG.

As described in the Final EIS, Zone A contains two general drainage areas. The western drainage area drains to the concrete flume and piped storm water system into the 30-inch combined sanitary/storm sewer pipe outfall located adjacent to the Irving Street and First Street intersection. The eastern drainage area drains through a piped storm water system and concrete and stone channels into the 42-inch storm drain outfall located west of the North Capitol Street/Irving Street interchange.

3.4.1 Impacts to Stormwater Management

No Action Alternative

Under the No- Action Alternative, AFRH-W would remain under Federal ownership, maintain its current operations and no new construction would occur. Therefore, there would be no additional direct, indirect or cumulative impacts stormwater management from the No Action Alternative.

Master Plan Alternative

The implementation of the 2008 Master Plan would result in a total increase of 19.9 acres of impervious surface area on the AFRH-W site, or an additional 7 percent of the overall project area (Table 3-3). No additional impervious area beyond the amount described in the Master Plan is proposed in this SEIS.

Due to the implementation of the 2013 SW Rule, new calculations of post-development stormwater retention volume requirements were conducted.

Table 3-3: Impervious Area

	Total Acreage	Total Impervious Area (Acres)		Percent Impervious Area	
		Existing/No Action Alternative	Master Plan Alternative	Existing/No Action Alternative	Master Plan Alternative
The AFRH Zone	191	15.2*	26*	8%	15%
Zone A	80	36.9	46	46%	56%
Total	272	52.1	72	19%	26%
Difference	-	-	+19.9	-	+7%

*These numbers include impervious surface area that was originally part of Zones B and C as described in the Final EIS. In this SEIS, Zones B and C have been incorporated into the AFRH Zone. In addition, the 3-acre Heating Plant area, which was originally included in the AFRH Zone, has been moved to Zone A.

The stormwater retention volume (SWRV) required to mitigate the implementation of this master plan was estimated using the methodology outlined in the SWMG (see Table 3-4). In order to compute the required SWRV, it is necessary to know the proposed land cover for each of the following categories: natural cover, compacted cover and impervious cover. Per the SWMG, natural cover is considered land that will remain undisturbed and exhibits hydrologic properties equal to or better than meadow in good condition OR land that will be restored to such a condition. This includes portions of residential yards in forest cover that will NOT be disturbed during construction, community open space areas that will not be mowed routinely, but left in a natural vegetated state (can include areas that will be rotary mowed no more than two times per year), utility rights-of-way that will be left in a natural vegetated state (can include areas that will be rotary mowed no more than two times per year) or other areas of existing forest and/or open space that will be protected during construction and that will remain undisturbed.

For this analysis, it was assumed that 20 percent of pervious areas within the AFRH Zone would be considered natural cover and 80 percent would be compacted cover. Within Zone A, it was assumed that 5 percent of the pervious area would be considered “natural cover” and 95 percent would be compacted cover (see Table 3-5).

Table 3-4: Stormwater Retention Volume Requirements

	Impervious Area (Sq. Ft.)	Water Quality Detention Vol. (Cu. Ft.)
The AFRH Zone	1,107,077	245,610
Zone A	2,154,914	236,301

(Source: DC Storm Water Management Guidebook, 2013; Adapted from Table 4-5 in the Final EIS.)

Table 3-5: Estimate of Total Annual Pollutant Loads (lbs/yr)

	Total Suspended Solids	Total Phosphorous	Total Nitrogen	Zinc
Master Plan Alternative				
the AFRH Zone	48	105	805	8
Zone A	63	493	3790	36

(Source: DC Storm Water Management Guidebook, 2003; Adapted from Table 4-6 in the Final EIS.)

The 2008 Master Plan recommends providing two stormwater management ponds to satisfy stormwater retention volume requirements for Zone A, but current stormwater management and low-impact development techniques encourage the use of a decentralized stormwater management system in place of the traditional pond (JLS, G&O, and SHG, 2010). Therefore, the Master Plan will likely require additional stormwater retention BMPs in order to eliminate the two traditional ponds and achieve compliance with the 2013 SW Rule.

Construction on AFRH-W campus would result in temporary impacts to stormwater quality. Disturbance of soils on the site increase the potential for sediment and contaminants to be transported off of the site during a storm. This impact would be temporary, lasting the duration of construction, and would be mitigated by the use of sediment and erosion control measures described below.

Mitigation Measures

The development proposed in the 2008 Master Plan was designed to comply with the former District of Columbia regulations to maintain post-development storm water quantity and quality at pre-development levels. The Final EIS anticipated that most of the required water quantity management volume would be provided by two stormwater management ponds, one in each drainage area. The western drainage area would be served by a pond located northwest of the intersection of Pershing Drive and the crescent-shaped road near the center of Zone A. The eastern drainage area would be served by a pond located immediately west of the crescent-shaped road. The Final EIS stated that these ponds would likely consist of permanently wet retention ponds and/or constructed wetland areas that would provide water quality benefits, but also included provisions for each of these ponds to serve only as detention ponds depending on the possibility for water quality treatment elsewhere on site. The stormwater retention volume requirement could also be satisfied with supplementary urban BMPs, including bioretention devices, water quality catch basins, manufactured water quality BMP's, and green roofs. The layout and sizing of each individual BMP would be fitted to the requirements of the local structure, road, or parking area it serves. Overall, the Final EIS concluded that the proposed Master Plan

would meet the requirements of the 1988 regulations, provided that the developer would obtain the necessary approvals from the District Department of Energy and Environment, Watershed Protection Division.

The Master Plan will likely require additional stormwater retention BMPs in order to achieve compliance with the 2013 SW Rule. Instead of the two traditional stormwater management ponds originally proposed in the Master Plan, low-impact development techniques could be implemented, such as bioretention areas, street trees, green roofs on new buildings, rain barrels or cisterns, and pervious sidewalk materials. Not only would this approach further reduce stormwater runoff, it is much more likely to be consistent with the 2013 stormwater regulations.

Throughout the Master Plan, new development has been located in order to preserve open space and wooded areas as much as possible. By concentrating large-scale development into Zone A of the AFRH-W campus, the implementation of the 2008 Master Plan will preserve and protect 174 acres of existing open space in the AFRH Zone, including the golf course, building quadrangles, woodlands, forests, and other open areas.

The Master Plan has minimized the amount of additional impervious surface by incorporating parking into proposed buildings, replacing excess surface parking lots with open space, prohibiting new surface parking lots, and limiting above-grade parking facilities to only four parcels. Where feasible, new buildings will be sited over existing surface parking lots to minimize additional impervious surface area. Open space such as fields, bike paths, and small pocket parks will be created and/or maintained in both development zones. The vegetative buffer along the perimeter wall of the campus in both zones will be preserved and enhanced with additional plantings, which will reduce stormwater runoff in these areas. Impacted trees or tree stands will be replaced in form and function to the maximum extent practicable.

A Stormwater Management Plan (SWMP) and a Soil Erosion and Sediment Control Plan will be prepared in accordance with the amended 21 DCMR 5 and the 2013 SWMG. All construction activities including clearing, grading, site stabilization, the preservation or creation of pervious land cover, the construction of drainage conveyance systems, the construction of BMPs, and all other stormwater and sediment related components of the project will be conducted in strict accordance with the SWMP.

3.5 Greenhouse Gases and Climate Change

Greenhouse gas (GHG) emissions, released from human activities and urban development, are widely recognized as a contributing factor to climate change, which may cause changes to temperatures, changes to patterns and intensities of precipitation, increased frequency and magnitude of severe weather, and/or sea level rise (EPA 2016). For these reasons, the management of GHG emissions and their associated effect on global climate change has become a concern and a priority for the general public, industry and government.

A GHG is any gas that contributes to potential climate change. Greenhouse gases absorb and trap heat that is radiated by the earth, preventing it from escaping to the atmosphere. This natural phenomenon is commonly known as the “greenhouse effect”; an increase in GHGs in the atmosphere intensifies the GHG effect by increasingly trapping heat within the atmosphere, thereby intensifying potential for climate change.

While the main sources of manmade GHG emissions are from the combustion of fossil fuels in large industries as well as for transportation, new commercial and residential developments can contribute GHG emissions to the atmosphere, which while generally on a much smaller scale individually as compared to large industrial sources, can collectively contribute to important GHG emission totals. New commercial and residential developments release GHGs to the atmosphere mainly via fossil fuel combustion from sources such as boilers in new buildings and emissions from construction activities, and by increased vehicular traffic to the Project site.

Common GHGs include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Other GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). HFCs and PFCs are mainly used as refrigerants; SF₆ is found in electrical equipment; and NF₃ is used in the plasma etching of silicon wafers and in the manufacturing of electronics. SF₆ and NF₃ are not included in this assessment. For this assessment, the focus of the analysis of GHGs is on CO₂, CH₄, and N₂O as the main GHGs that may be released from the project. Although they may be present in refrigerants used in the HVAC systems for any new AFRH-W buildings, the quantities of HFCs or PFCs released would not be substantive and are therefore not further assessed. In addition, the project would not use NF₃, and any electrical equipment containing SF₆ would be subjected to monitoring and maintenance and would be owned and managed by the electrical utility.

For this assessment, GHGs are converted and reported as metric tonnes of carbon dioxide equivalents (tCO₂e). This is a standard practice that simplifies emission reporting with CO₂e representing the sum of the individual GHGs, weighted to represent the atmospheric effects of individual GHGs in comparison to CO₂. The global warming potential (GWP) is a measure of the global warming effect that a particular GHG will have on the atmosphere relative to the impact of CO₂. The GWPs of CO₂, CH₄ and N₂O are 1, 25 and 298, respectively (IPCC 2013).

Legislation, Policy, and Guidance

In March 2015, the President of the United States issued a formal statement to the United Nations Framework Convention on Climate Change to “reduce the country’s greenhouse gas emissions by 26-28% below 2005 levels by 2025, and to make best efforts to reduce by 28%” (The White House 2015; UNFCCC 2015).

The District of Columbia has also committed to addressing GHG emissions and climate change. The District of Columbia set targets to reduce GHG emissions by 50% below 2006 levels by 2032, and by 80% by 2050, in addition to pledging to consider climate adaptation in an effort to prepare for future climate change (DOEE 2016c and DOEE 2016d). The District of Columbia completes GHG inventories to track its progress towards meeting their goals. Between 2006 and 2011, city-wide GHG emissions fell by 12.5%, and emissions from government operations decreased by 23.5%.

Greenhouse Gas Emissions

According to the United States National Inventory Report for 2013 (most recent publicly available data), the quantity of GHG emissions released to the atmosphere by the country was 6,673 million metric tonnes (Mt) of CO₂e (EPA 2015a and EPA 2015b). Global GHG emissions in 2012 (most recent publicly available data) have been estimated to be 44,800 MtCO₂e (excluding land use change and forestry) (WRI 2015). Therefore, the contribution to global GHG emissions by the United States is approximately 14.9%.

The District of Columbia was responsible for approximately 9.5 MtCO₂e in 2011 (DOEE 2012), which represents approximately 0.14% of the country's total CO₂ emissions in that year (6,777 MtCO₂e) (EPA 2015a). Approximately 22% of the emissions in the District of Columbia are attributed to vehicles and transportation (DOEE 2012).

Climate Change

The leading climate change research organization in the United States is the US Global Change Research Program (USGCRP). The USGCRP collects and assesses climate change research from around the US and summarizes the impacts by geographic region and by sector. The USGCRP is mandated to conduct National Climate Assessments for the US every four years; the most recent report was published in 2014 (USGCRP 2014). The 2014 report notes the following observations for the Northwest region (which includes Washington, D.C.):

- *“Heat waves, coastal flooding, and river flooding will pose a growing challenge to the region’s environmental, social and economic systems. This will increase the vulnerability of the region’s residents, especially its most disadvantaged populations”.*
- *“Infrastructure will be increasingly compromised by climate-related hazards, including sea level rise, coastal flooding, and intense precipitation events”.*
- *“Agriculture, fisheries and ecosystems will be increasingly compromised over the next century by climate change impacts. Farmers can explore new crop options, but these adaptations are not cost or risk-free”.*
- *“While a majority of states and a rapidly growing number of municipalities have begun to incorporate the risk of climate change into their planning activities, implementation of adaptation measures is still at early stages” (USGCRP 2014).*

3.5.1 Impacts to Greenhouse Gases and Climate Change

No Action Alternative

Under the No Action Alternative, AFRH-W would remain under Federal ownership, maintain its current operations and no changes in GHG emissions would occur. Therefore, there would be no additional

direct, indirect or cumulative impacts to GHG emissions or a resulting contribution to climate change arising from the No Action Alternative.

Master Plan Alternative

Direct Impacts

Construction activities may result in a temporary increase in GHG emissions compared to the existing conditions. Emissions from construction equipment including earth moving equipment, demolition equipment, and paving equipment, would generate GHG emissions. Although construction of AFRH-W would extend over a 10-year period, the intensity, duration, location and type of construction and resulting emissions would vary over time. Therefore, development under the Master Plan Alternative would have short-term, minor, adverse impacts on GHGs and climate change. The extent of construction is relatively small and thus would not be expected to add measurably to GHG emission totals in the District of Columbia.

The 2007 Final EIS included an analysis of emissions from mobile sources for AFRH-W, as part of the Air Quality assessment. That analysis focused on carbon monoxide (CO) because it is localized and directly relates to traffic volumes and patterns, which will be affected by the future development of AFRH-W. Based on the previous mobile source air quality study, localized CO concentrations over a peak traffic 8-hour period were predicted to increase from 3.9 to 4.4 ppm, or approximately 13 percent. As CO and CO₂ emissions from vehicle traffic are directly related (as both are products of gasoline and diesel combustion), it is reasonable to expect that there would also be a small increase in CO₂ emissions from construction-related traffic. The combustion of gasoline and diesel in vehicles would also yield quantities of CH₄ and N₂O, although they would be small in comparison to CO₂ (even in consideration of GWPs).

Although the changes in GHG emissions arising from AFRH-W would be small and inconsequential in relation to the overall traffic volumes in the District of Columbia, the Master Plan Alternative would nonetheless cause a small incremental increase in GHG emissions compared to the No Action Alternative. Therefore, mobile sources are expected to have a direct, but minor, impact on GHG emissions and their associated contribution to climate change.

The 2007 Final EIS included an analysis of air contaminant emissions from stationary sources, based on the additional new natural gas fired boiler capacity that would be required to support the proposed Master Plan Alternatives. The calculations and methodology used for the GHG emissions stationary source analysis are based on the data and methodology presented in the 2007 Final EIS Air Quality Appendix. The results are presented in Table 3-6.

The estimated GHG emissions from the new natural gas boiler capacity for the AFRH-W development is 24,445 tCO₂e/year. The estimated CO₂e emissions from the Master Plan Alternative represents approximately 0.32 percent of the overall CO₂e emissions released by the District of Columbia (9.5 MtCO₂e in 2011) (DOEE 2012), or 0.0005 percent of the overall CO₂e emissions released by the United States (6,777 MtCO₂e in 2011).

Although the changes in GHG emissions arising from the boilers would be small, the Master Plan Alternative would nonetheless cause a minor incremental increase in GHG emissions in the immediate vicinity of the AFRH-W campus compared to existing conditions. Therefore, stationary sources are

expected to have a direct, minor impact on GHG emissions and their associated contribution to climate change.

Table 3-6: Greenhouse Gas Emissions from Increased Natural Gas Boiler Capacity for the Master Plan Alternatives

Project Alternatives	Commercial gsf	Residential gsf	MMBtu/hr	Annual Hours	Hourly gas volume (ft ³ /hr)	Emission rate (lb CO ₂ /hr)	Emission rate (lb CH ₄ /hr)	Emission rate (lb N ₂ O/hr)	Emission rate (tonnes CO ₂ /yr)	Emission rate (tonnes CH ₄ /yr)	Emission rate (tonnes N ₂ O/yr)	TOTAL Emissions (tonnes CO ₂ e/yr)
Master Plan Alt	4,230,000	1,825,000	159.8	2,850	156,647	18,798	0.3603	0.3446	24,301	0.4658	0.4455	24,445

Notes:

- 1) gsf = gross square feet
- 2) The energy per hours (natural gas use in MMBtu/hr) is divided by the gas heating rate (1,020 BTU/ft³) to calculate the hourly gas volume (ft³/hr).
- 3) The hourly gas volume is then multiplied by emission factors, the aAT annual hours of operation, and the global warming potentials to calculate total emissions (tonnes CO₂e/year) for the development alternatives.
- 4) MMBTU/hr values are calculated from a heating value of 36 BTU/gsf/hr.
- 5) Commercial gsf is assumed to require the maximum boiler usage for 12 hours per day, for half of the year (2,190 hours).
- 6) Residential gsf is assumed to require the maximum boiler usage for 24 hours per day, for half of the year (4,380 hours).
- 7) Annual hours of operation are calculated using the methodology provided in the 2007 AFRH EIS Appendix for Air Quality, which is: 2,190 hrs/year * (gsf commercial/gsf total) + 4,380 hrs/year * (gsf residential/gsf total)
- 8) It was determined there would be an estimated 58.2 MMBTU/hr excess capacity from the existing AFRH boilers that would be available for future expansion. Therefore, the boiler capacity for each alternative was derived from subtracting 58.2 MMBTU/hr from the total boiler energy requirements.

Emission factors (lb/10⁶ standard cubic foot) were obtained from the US EPA AP-42, Chapter 1 – External Combustion Sources, natural gas boilers. They are: 120,000 for CO₂, 2.3 for CH₄ and 2.2 for N₂O.

Indirect Impacts

Sources of indirect GHG emissions are generally considered to be those GHG emissions that are generated by another entity but are directly affected by the entity reporting the emissions as indirect. Indirect GHGs include emissions from the consumption of purchased electricity or steam, as well as other indirect activities (including the extraction and production of purchased materials and fuels, electricity-related activities such as transmission and distribution losses, and waste disposal) (GHG Protocol 2012). Emissions associated with the consumption of purchased steam and other indirect activities would not be substantive and these are therefore not assessed further.

Indirect GHG emissions from electricity use would be the largest indirect GHG impact. The 2007 Final EIS and this EIS state that the electricity demand from AFRH-W would be substantially higher than the current power use at the site. According to the U.S. National Inventory Report, the residential and commercial sectors rely heavily on electricity for meeting energy demands (68 percent and 75 percent, respectively) (EPA 2015a and EPA 2015b). Therefore, the District of Columbia's GHG emissions from electricity use could be as much as 55 percent (5.2 MtCO_{2e} in 2011) (DOEE 2012) of the District of Columbia's total annual GHG emissions.

According to the U.S. Energy Information Administration, energy-related carbon dioxide emissions have declined in recent years, a trend that is mostly due to emissions reductions by the electric power sector. Electricity producers have become less carbon intensive for two reasons: 1) the industry has been substituting cleaner-burning fuels (e.g., natural gas) for carbon-rich fuels (e.g., coal and petroleum) for electricity production, and 2) the growth of renewable fuels such as wind and solar power (EIA 2014). Therefore, over time, the effect of indirect emissions from electricity use in the U.S. will decrease as the electricity grid becomes less reliant on carbon intensive fuels.

The potential GHG emissions from the Master Plan Alternative would be a very small percentage of the District of Columbia's total GHG emissions. Therefore, GHG emissions from purchased electricity is expected to have an indirect, minor impact on GHG emissions and their associated contribution to climate change.

Mitigation Measures

The mitigation measures recommended in the 2007 Final EIS, and in Section 3.11 of this SEIS, are also applicable to GHGs and climate change. In addition, the effects of increased GHGs can be mitigated as follows:

- Implementation of an idling reduction program to reduce emissions associated with unnecessary vehicle idling;
- Implementation of preventative maintenance schedules for construction equipment, to improve the operational efficiency and reduce GHG emissions;
- Energy conservation measures and/or renewable energy sources could be incorporated into building design to mitigate impacts related to emissions from energy use; and
- Incorporate climate adaptation techniques/systems into the new development. Improved building design, operations, increased green space (such as rooftop gardens or landscaping), and water management can reduce energy use in buildings and can protect them from severe precipitation, flooding and increases in temperature (CCAP 2014).

3.6 Land Use Planning and Zoning

Regional Land Use Planning and Zoning

Since the 2008 Master Plan was approved, the area surrounding AFRH-W has been subject to several development projects with many others in the planning phase. Additionally, *The Comprehensive Plan for the National Capital* was updated in 2016 with new goals, objectives and planning policies to help guide development in the District of Columbia. Due to the potential impact this project would have on land use, planning and zoning in the region, the topics are being reevaluated in this SEIS.

The District of Columbia has a guiding planning document, *The Comprehensive Plan for the National Capital*, which states goals, objectives, and planning policies to direct and manage growth in the District. This plan contains both Federal Elements and District of Columbia Elements. The Comprehensive Plan was developed in 2006 and amended in 2011 and 2016. NCPC updated the Federal Elements of the Comprehensive Plan in 2016. DCOP is currently in the process of updating the District Elements of the Comprehensive Plan (DCOP 2011).

The Federal Elements of the Comprehensive Plan are prepared by NCPC and provide a policy framework for the federal government in managing its operations and activity in the National Capital Region. Federal elements include: Urban Design, Federal Workplace, Foreign Missions & International Organizations, Transportation, Federal Environment, Historic Preservation, Visitors & Commemoration and Parks & Open Space (NCPC 2016).

The District Elements focus specifically on the District of Columbia and contain a broad range of objectives and policies to help guide public decisions by District and federal agencies. The District Elements are broken down into Citywide Elements and Area Elements. Citywide elements include a broad range of planning topics that should be considered regardless of geographical location in the District. These include: Land Use, Transportation, Housing, Economic Development, Parks, Recreation and Open Space, Educational Facilities, Environmental Protection, Infrastructure, Urban Design, Historic Preservation, Community Services and Facilities, and Arts and Culture. Area Elements are divided geographically to focus on issues that are unique to particular parts of the District. Area Elements are divided into 10 areas: Capitol Hill, Central Washington, Far Northeast and Southeast, Far Southeast and Southwest, Lower Anacostia Waterfront and Near Southwest, Mid-City, Near Northwest, Rock Creek East, Rock Creek West and Upper Northeast.

Federal Elements - The Federal Elements of the Comprehensive Plan for the National Capital provides criteria for the location of federal facilities, such as AFRH-W, and provides policies on federal employment in the National Capital Region. The Federal Facilities elements of the plan that are relevant to AFRH-W include:

- **Federal Environment:** It is the goal of the Federal government to “promote the National Capital Region as a leader in environmental stewardship and sustainability. The federal government seeks to preserve and enhance the quality of the region’s natural resources to ensure that their benefits are available for future generations to enjoy.”
- **Parks, Open Space, and Natural Features:** Conserve and enhance the park and open space system of the National Capital Region, ensure that adequate resources are available for future generations, and promote an appropriate balance between open space resources and the built

environment. Open space is broadly defined as “any land or water surface that is not occupied by buildings.” The Parks and Open Space Element of the Comprehensive Plan includes preservation and maintenance policies including the need to “conserve portions of military reservations that add significantly to the inventory of park, open space, and natural areas and should, to the extent practicable, be used by the public for recreation.” AFRH-W is listed as an example of a military reservation where open space should be conserved.

- Preservation and Historic Features: Preserve, protect and rehabilitate historic properties in the National Capital Region and promote design and development that is respectful of the guiding principles established by the Plan of the City of Washington and the symbolic character of the capital’s setting.
- Urban Design: Promote quality design and development in the National Capital Region that reinforces its unique role as the nation’s capital and creates and welcoming and livable environment for people.

Transportation: Develop and maintain a multi-modal regional transportation system that meets the travel needs of workers, residents, and visitors, while improving regional mobility and air quality through expanded transportation alternatives and transit-oriented development.

District Elements - The Comprehensive Plan divides District Elements into two categories: Citywide Elements and Area Elements. Citywide Elements of the Comprehensive Plan relevant to the proposed AFRH-W project include Land Use, Transportation, Housing, Economic Development, Parks, Recreation and Open Space, Environmental Protection, Infrastructure, Urban Design, Historic Preservation, and Community Services and Facilities. The AFRH-W project falls within the Rock Creek East Area Element.

Citywide Elements

- Land Use: This element establishes the basic policies guiding the physical form of the city, and provides direction on a range of development, conservation, and land use compatibility issues.
- Transportation: The Transportation element provides policies and actions to maintain and improve the District’s transportation system and enhance the travel choices of current and future residents, visitors and workers.
- Housing: The Housing Element describes the importance of housing to neighborhood quality in the District and the importance of providing housing opportunities for all segments of the population.
- Economic Development: The Economic Development Element addresses the future of the District’s economy and the creation of economic opportunity for current and future District residents. It includes strategies to sustain Washington’s major industries, diversify the economy, accommodate job growth, maintain small businesses and neighborhood and commercial districts and increase access to employment for District residents.
- Parks, Recreation & Open Space: This element recognizes the important role parks play in recreation, aesthetics, neighborhood character, and environmental quality. It includes policies on related topics such as recreational facility development, the use of private open space and the creation of trails to better connect the city’s open spaces and neighborhoods.

- **Environmental Protection:** This element addresses the protection, restoration, and management of the District’s land, air, water, energy and biologic resources. It provides policies and actions on important issues such as drinking water safety, the restoration of our tree canopy, energy conservation, air quality, watershed protection, pollution prevention and waste management, and the remediation of contaminated sites.
- **Infrastructure:** The Infrastructure Element provides policies and actions on the District’s water, sanitary sewer, stormwater, solid waste management, energy, and telecommunication systems.
- **Urban Design:** The element describes the ways in which different aspects of the city’s landscape - especially its buildings, streets, and open spaces - work together to define impressions of Washington and its neighborhoods.
- **Historic Preservation:** The Historic Preservation Element defines the District’s role in promoting awareness of Washington history, identifying and preserving historic resources, and ensuring compatible design in historic neighborhoods
- **Community Services and Facilities:** This element provides policies and actions on health care facilities, child care and senior care facilities, libraries, police stations, fire stations, and other municipal facilities such as maintenance yards.

Area Elements

- **Rock Creek East:** The Rock Creek East Planning Area encompasses the 7.4 square miles located east of Rock Creek Park, north of Spring Road, NW, and west of North Capitol Street and Riggs Road. The area is characterized by low to moderate residential neighborhoods that offer plenty of open space and a park-like atmosphere. The major planning objective throughout the community is to conserve these traits as the housing stock matures and infill development occurs.

Project Area Land Use, Planning and Zoning

Land Use - According to the District of Columbia Generalized Land Use Map, land use on AFRH-W is characterized as “federal,” meaning that the land and facilities onsite are occupied by the federal government (DCOP 2006). Specific uses on AFRH-W include administrative, residential, institutional (medical facilities), open space, and a golf course. The administrative buildings are primarily located on the northern portion of AFRH-W. Residential areas are located in the northeastern portion of the site. Institutional areas including King Health Center are located in the central portion of the site. The golf course and other open spaces are located in the southwestern portion of the site. The Lincoln Cottage and Administration building have been renovated to serve as a museum and visitor center.

Land uses adjacent to AFRH-W are residential, institutional (medical, and education facilities), and commercial retail (see Figure 3-2). The District of Columbia Generalized Land Use Map shows the areas northwest and southwest of the site as moderate density residential, which is defined as row houses and garden apartments and some low density housing. The area southeast of the site is categorized institutional, federal and residential according to the DC Land Use Map. Washington Hospital Center and the Veterans Administration Hospital are located in this southeast area. East of the site is also categorized as institutional land and is the location of Catholic University and The Basilica of the Shrine

of the Immaculate Conception. Located north of AFRH-W are the Soldiers' and Airmen's Home National Cemetery and the Rock Creek Church, both categorized Parks, Recreation and Open Space.

Planning - According to the District Department of Transportation (DDOT), there are several planned developments in the vicinity of the AFRH-W. The following is the list of planned developments in the vicinity of the AFRH-W with a description of each (Except where noted, the timing of these development projects is not known).

Catholic University of America Master Plan: The Catholic University of America (CUA) Master Plan provides a comprehensive plan to guide the growth of the University in order to meet future needs. The Master Plan lays out a series of goals it hopes to meet in the future and proposed actions needed to meet those goals.

Catholic University of America South Campus Redevelopment: An underutilized parcel (comprised of approximately six blocks), previously owned by The Catholic University of America south of Michigan Avenue, known as the South Campus, will be rezoned and redeveloped into a mixed-use development consisting of residential, retail, and arts components that would be interwoven into the existing Brookland neighborhood.

VA Medical Center (VAMC) Master Plan: The Master Plan addresses the integration of major capital improvements, including roadway and circulation (vehicular and pedestrian) parking, transit, stormwater management, utility improvements, landscape, etc. into the VAMC campus.

818 Michigan Avenue: The site is currently occupied by several abandoned buildings which were previously occupied by industrial uses. The site will be redeveloped into a parking garage which will add 1,441 additional parking spaces to the Brookland neighborhood.

McMillan Sand Filtration Site: The site is a Planned Unit Development (PUD) which will feature mixed use residential facilities, retail space and a medical facility. The PUD is currently awaiting final approval from the Historic Preservation Review Board and the Zoning Commission. Construction is slated to begin in 2016.

Howard University Central Campus Master Plan: The Master Plan sets forth a development plan for the central campus which outlines expansion opportunities that will promote increased campus connectivity.

Michigan at Irving PUD: The site is a proposed PUD located within the northwest quadrant of the Michigan Avenue at the Irving Street intersection. The proposed plan includes residential, retail, and hotel uses.

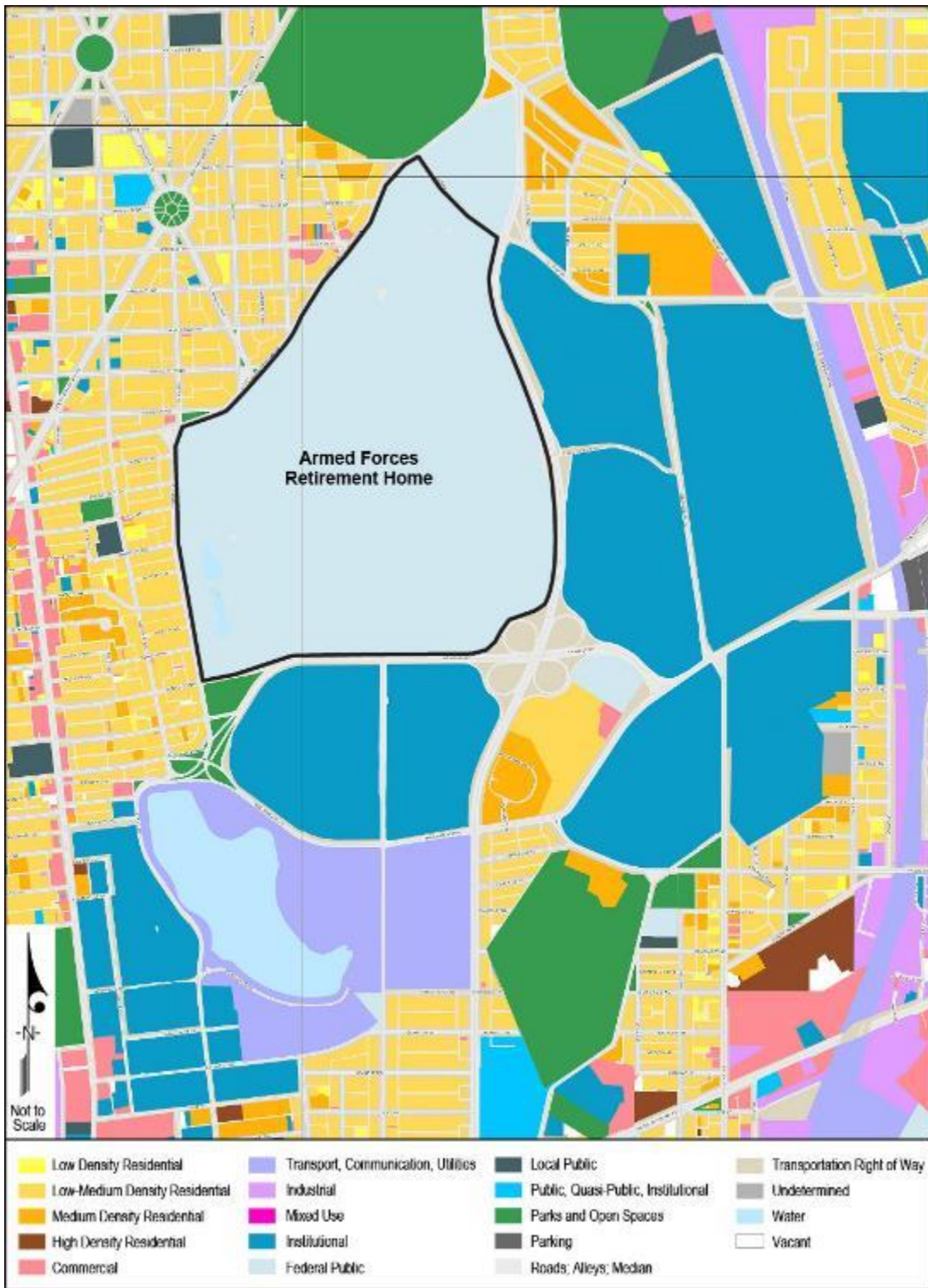


Figure 3-2: Existing Land Use (DCOP 2006)

Zoning – AFRH-W is currently not subject to District zoning regulations. On Aug 2, 2007, AFRH signed a Memorandum of Understanding (MOU) with DC Office of Planning (DCOP) and NCPC to establish a hybrid approach for controls over the mixed-use redevelopment of a portion of AFRH-W (NCPC, DCOP, and AFRH 2007) under a long-term ground lease scenario entailing private development on federally-owned land. Under the terms of the MOU, zoning would be created to allow matter-of-right development of the Master Plan for the Development Zone.

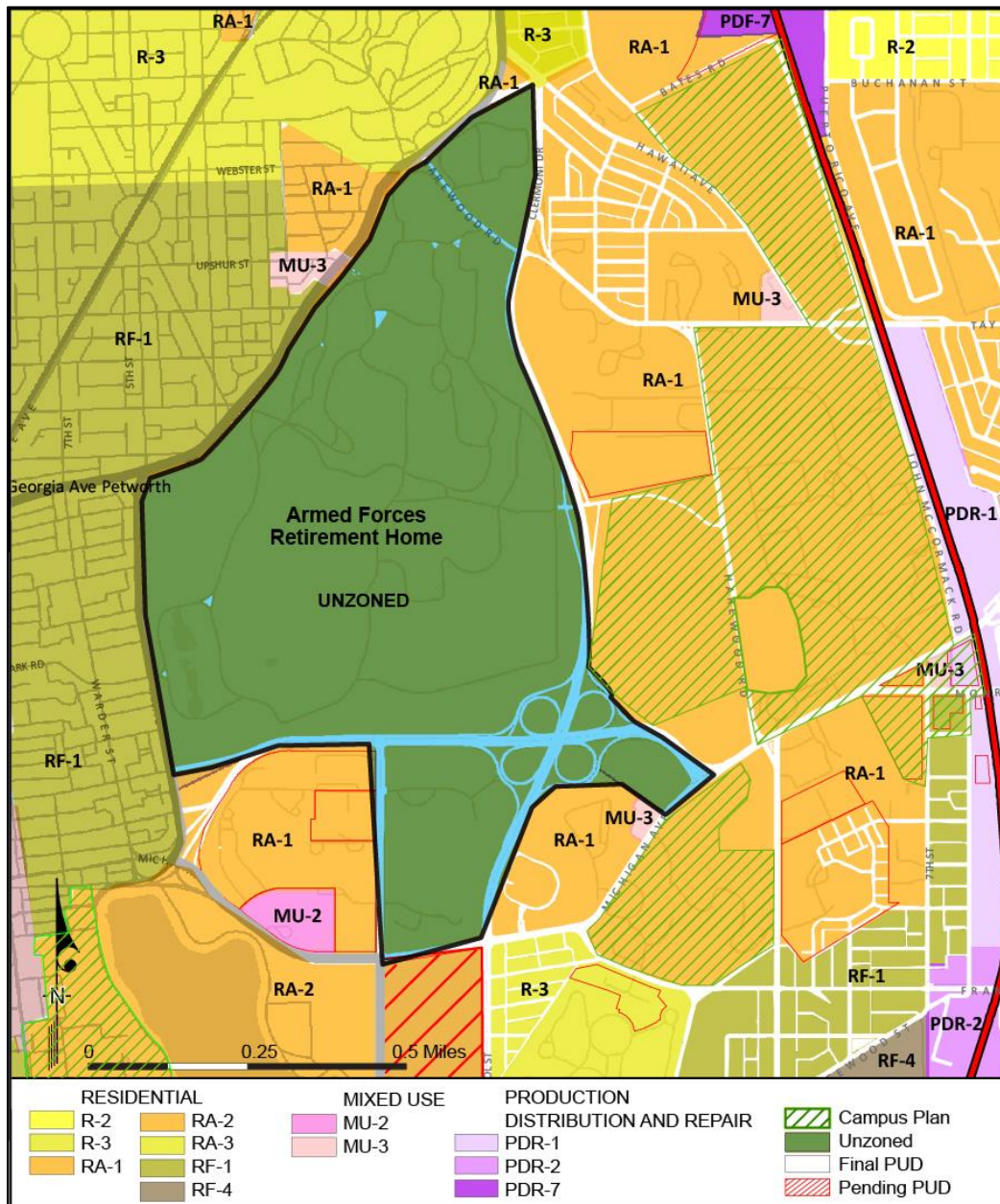


Figure 3-3: Zoning (DCOZ 2017a)

3.6.1 Impacts to Land Use Planning and Zoning

Land use and zoning impacts attributable to a project are determined by changes to the site and the surrounding area, including changes in density and use, induced development, spurred revitalization, or increased vacancy. Such changes are typically a function of the scale of the proposed development, proximity of other uses to the project site, existing zoning, the availability of vacant or underutilized land, the condition of surrounding buildings, and outside development forces.

The following section discusses the impacts to land use and zoning for the No Action Alternative as well as the Master Plan Alternative.

No Action Alternative

Under the No Action Alternative, AFRH-W would remain under federal ownership and no development would occur. As a result, land use and zoning would remain unchanged. Therefore, no direct, indirect or cumulative impacts would occur.

Master Plan Alternative

Compatibility of the Master Plan Alternative with the Federal and District of Columbia Elements of the Comprehensive Plan is described below.

Regional Land Use Planning and Zoning

Federal Elements

Federal Environment: Development on AFRH-W would alter the natural and built environment. The Master Plan Alternative would result in the use of natural resources as described in the 2007 Final EIS. The Master Plan Alternative would develop the site in a sustainable manner in order to protect the natural environment and minimize energy use to the extent possible. The Master Plan Alternative would be consistent with the Federal Environment Element of the Comprehensive Plan.

Parks, Open Space, and Natural Features: The Master Plan Alternative would have an impact on open space on AFRH-W. However, the Alternative has been developed to conserve open space on the site and promote an appropriate balance between open space resources and the built environment. Additionally, the Master Plan Alternative would involve the addition of parks to the residential development area. The Master Plan Alternative would be consistent with the Parks, Open Space and Natural Features Element of the Comprehensive Plan.

Preservation and Historic Features: The Master Plan Alternative would impact historic features including the historic landscape as described in the 2007 Final EIS. These impacts would be mitigated through a Programmatic Agreement with the DC SHPO, National Park Service and ACHP. The Master Plan Alternative would be consistent with the Preservation and Historic Features Element of the Comprehensive Plan.

Urban Design: The implementation of the Master Plan Alternative would ensure that development on AFRH-W would “complement the natural environment, provide visual orientation, enhance the District’s aesthetic qualities, emphasize neighborhood identities, and be functionally efficient.” Design guidelines are set forth by the 2008 Master Plan. The Master Plan Alternative would be consistent with the Urban Design Element of the Comprehensive Plan.

Transportation: As described in Section 3.2.5 of this SEIS, a Transportation Management Plan will be developed under the Master Plan Alternative which will guide transportation aspects of the development of Zone A including commuter connections, parking, transit use, and traffic impacts. Roadway improvements will be implemented in order to mitigate for future traffic impacts. The Master Plan Alternative would be consistent with the Transportation Element of the Comprehensive Plan.

District of Columbia Elements

Citywide Elements

- Land Use: The Master Plan Alternative would develop AFRH-W with Federal and private mixed use development that would be compatible with current land use and proposed development of the surrounding area. Therefore, the Master Plan Alternative would be consistent with the Land Use Element of the Comprehensive Plan.
- Transportation: As described in Section 3.2.5 of this SEIS, a Transportation Management Plan will be developed under the Master Plan Alternative which will guide transportation aspects of the development of Zone A including commuter connections, parking, transit use, and traffic impacts. Roadway improvements will be implemented in order to mitigate for future traffic impacts. The Master Plan Alternative would be consistent with the Transportation Element of the Comprehensive Plan.
- Housing: The development of AFRH-W would include creation of new residential and assisted living housing opportunities that would be available to a range of District residents. Therefore, the Master Plan Alternative would be consistent with the Housing Element of the Comprehensive Plan.
- Economic Development: As described in Section 2.1.2 of this SEIS, the Master Plan Alternative would include retail and commercial development, providing additional jobs compatible with this element of the Comprehensive Plan. In addition, construction jobs would continue for over 10 years. The Master Plan Alternative would be consistent with the Economic Development Element of the Comprehensive Plan.
- Parks, Recreation & Open Space: The Master Plan Alternative would have an impact on open space on AFRH-W. However, the Alternative has been developed to conserve open space on the site and promote an appropriate balance between open space resources and the built environment. Additionally, the Master Plan Alternative would involve the addition of parks to the residential development area. The Master Plan Alternative would be consistent with the Parks, Recreation and Open Space Element of the Comprehensive Plan.
- Environmental Protection: Development on AFRH-W would alter the natural and built environment. The Master Plan Alternative would result in the use of natural resources as described in the 2007 Final EIS. The Master Plan Alternative would develop the site in a sustainable manner in order to protect the natural environment and minimize energy use to the extent possible. Therefore, the Master Plan Alternative would be consistent with the Environmental Protection Element of the Comprehensive Plan.
- Infrastructure: Development on AFRH-W would tie into existing utilities. The new development would increase the amount of impervious area on the site. Impacts to stormwater management are discussed in Section 3.2.1 of this SEIS. BMPs would be

used to reduce runoff and erosion during storm events. The Master Plan Alternative would be consistent with the Infrastructure Element of the Comprehensive Plan.

- **Urban Design:** The implementation of any of the Master Plan Alternatives would ensure that development on AFRH-W would “complement the natural environment, provide visual orientation, enhance the District’s aesthetic qualities, emphasize neighborhood identities, and be functionally efficient.” Design guidelines are set forth by the 2008 Master Plan. The developer of Zone A would be required to follow these guidelines. The Master Plan Alternative would be consistent with the Urban Desi Element of the Comprehensive Plan.
- **Historic Preservation:** The Master Plan Alternative would impact historic features as described in the 2007 Final EIS. These impacts would be mitigated through the requirements of the existing Programmatic Agreement between AFRH, NCPC, DC SHPO, NPS and ACHP. The Master Plan Alternative would be consistent with the Historic Preservation Element of the Comprehensive Plan.
- **Community Services and Facilities:** The Master Plan Alternative includes development intended for medical facilities and assisted living homes for senior citizens. Additionally, the development would be connected to its surrounding neighborhoods so residents would have access to local community amenities and emergency services. The Master Plan Alternative would be consistent with the Community Services and Facilities Element of the Comprehensive Plan.

Area Elements

- **Rock Creek East:** The Plan recommends the redevelopment of the AFRH-W property, but stresses that any improvements should consider area context, density, resource protection, and open space conservation. Any continuing redevelopment should also coordinate with other documents and update master plans as necessary. The Master Plan Alternative would be consistent with the Rock Creek East Area Element of the Comprehensive Plan.

Project Area Land Use and Zoning

Implementation of the Master Plan Alternative would expand the mix of uses on the site. On August 2, 2007, AFRH signed a MOU with DCOP and NCPC to establish a hybrid approach for controls over the mixed use redevelopment of parts of the campus that would be developed by the private sector. Under the MOU, federal use development occurring within the AFRH Zone would not be subject to review or approval by DCOP. Private development would be subject to the zoning established under the terms of the MOU and reviewed under the terms of the Programmatic Agreement (PA).

Under the Master Plan Alternative, the land uses would be expanded from primarily open space and Federal institutional/residential use to Residential, Institutional, Hotel/Conference Center, Research and Development, Retail, and Medical. The AFRH Zone would be developed with moderate in-fill development for institutional uses compatible with AFRH-W operations. The AFRH Zone would be developed with new residential units for AFRH-W use, lease, or sale. This development would replace open and forested space. Zone A would be developed with residential, commercial, medical, retail,

assisted living and hotel uses. This development would replace AFRH-W facilities located along North Capital Street.

Residents of AFRH-W and the houses on Park Place who are accustomed to the open space on AFRH-W may view these changes in land use as direct, long-term, moderate, and adverse. However, the changes in land use will generate revenue to meet the needs of AFRH and thus have a direct, major, long-term, beneficial impact. The changes would be compatible with surrounding land uses.

AFRH-W is currently not subject to District zoning regulations; however, if any portions of the site were to be sold, those portions would be subject to the zoning established under the terms of the MOU and reviewed under the terms of the Programmatic Agreement (PA). Implementation of the Master Plan may result in a change to zoning on the site if segments of AFRH-W are sold and portions of Zone A are developed as commercial use. As noted above, there is a MOU among AFRH, DCOP and NCPC whereby the DC Zoning Commission will consider the AFRH Master Plan. Development covered by the MOU will be subject to a map amendment case to be brought by DCOP so as to bring that development within the matter of right provisions of the DC Zoning Regulations.

If the property is rezoned due to a sale, an application would be made to the DC Zoning Commission for an amendment to the District of Columbia's zoning map. A map amendment would be required because the land is currently zoned RA-2, medium-density development of general residential uses. Typically, the Commission looks at the zoning designations of surrounding properties in deciding the conformance of a map amendment. An application for a PUD would also be completed. A PUD is an overlay district that permits flexibility of development. The DC Zoning Commission can approve height and bulk requirements more or less stringent than those in the underlying zone.

NCPC also has a review role in any proposed amendment to the zoning map. Its recommendation addresses the conformity of the change with the comprehensive plan (see 40 U.S.C. §71g). At the Federal level, the NCPC would have two review roles in any development proposal: approvals of the development plan, and approvals of any map amendment.

At the local level, the DCOP Development Review Division is responsible for reviewing the development plan, and the DC Zoning Commission prepares, adopts, and amends the zoning regulations and zoning maps. The final approval authority at the local authority rests with the DC Zoning Commission if any segments of the site are sold. The approved Master Plan will be used by DCOP as the basis for land use planning, and will be used to recommend zoning to the Zoning Commission for consideration and adoption.

Implementation of the AFRH-W Master Plan could serve as a catalyst for further development in the surrounding area, which could involve changes in land use or zoning. Therefore, an indirect, long-term, minor, beneficial impact could occur.

The character of the area surrounding AFRH-W has changed throughout the years from rural to urban. This change in character has resulted in a change in land use and zoning in the area. Therefore, past and present development has had a long-term, major, adverse cumulative impact on land use. Future development would likely be consistent with current land use and zoning designations in the area.

Mitigation Measures

No mitigation measures are proposed for land use planning and zoning.

3.7 Transportation

Since the approval of the 2008 Master Plan, the area surrounding AFRH-W has been subject to several development projects with many others in the planning phase. These projects and the proposed development at AFRH-W would impact the local transportation network. Because local traffic conditions have changed since 2007, and because newly proposed development projects will have different impacts on the transportation network, the transportation impacts of this project are being reevaluated in this SEIS.

Principal Roadways

Stantec consulted with the District of Columbia Department of Transportation (DDOT) to establish a study area for the evaluation of transportation impacts. The transportation study area is primarily bounded by Irving Street (NW and NE) to the north, Michigan Avenue (NW and NE) to the south, North Capitol Street to the east, and Park Place NW to the west. However, it also extends in three directions to include segments of major corridors that the proposed development would affect:

- In the northerly direction along North Capitol Street to New Hampshire Avenue,
- In the easterly direction along Irving Street to the intersection with Michigan Avenue NE, and
- In the westerly direction along Columbia Road NW to the intersection with Warder Street NW.

The main roadways in the vicinity of AFRH-W are shown in Figure 3-4 and listed with their defining characteristics in Table 3-8 below.

Table 3-7: Study Area Major Corridor Characteristics

Roadway	Functional Class	2013 AADT	Number of Lanes, Median	Speed Limit (mph)	Primary Truck Route/Designated Loading Zones?
North Capitol Street	Principal Arterial	37.6/38.4/45.1	5, None 6, Grass	25/30	Yes/No
New Hampshire Avenue NW	Principal Arterial	13.6	4, None	30	Yes/No
New Hampshire Avenue NE	Minor Arterial	18.8	4, None	25	Yes/No
Kennedy Street NW	Collector	4.5	2, None	25	No/No
Missouri Avenue NW	Principal Arterial	27.2	4, None	25	Yes/No
Riggs Road NE	Principal Arterial	26.3	4, None	25	Yes/No
Hawaii Avenue NE	Collector	6.3	2, None	25	No/No
Rock Creek Church Road NW	Collector	3.5	3, None	25	No/No

Roadway	Functional Class	2013 AADT	Number of Lanes, Median	Speed Limit (mph)	Primary Truck Route/Designated Loading Zones?
Harewood Drive NW	Collector	4.5	2, One Way, None	25	No/No
Fort Drive NE	Minor Arterial	10.8	4, None	25	No/No
Scale Gate Road	Local	-	2, None	25	No/No
Irving Street (NW and NE)	Minor Arterial	7.3/28/19.7	6, Grass	25	Yes/No
Michigan Avenue (NW and NE)	Minor Arterial	27/22.1	4-6, None	25	Yes/No
Franklin Street NE	Minor Arterial	12	2, None	25	No/No
First Street NW	Collector	-	4, Grass/Concrete	25	No/No
Columbia Road NW	Minor Arterial	3	1, None	25	No/No
Hobart Place NW	Minor Arterial	7.3	2, Grass	25	No/No
Warder Street NW	Collector	5.3	1, None	25	No/No
Park Place NW	Minor Arterial	7.1	1, None	25	No/No
Kenyon Street NW	Minor Arterial	-	1, None	25	No/No

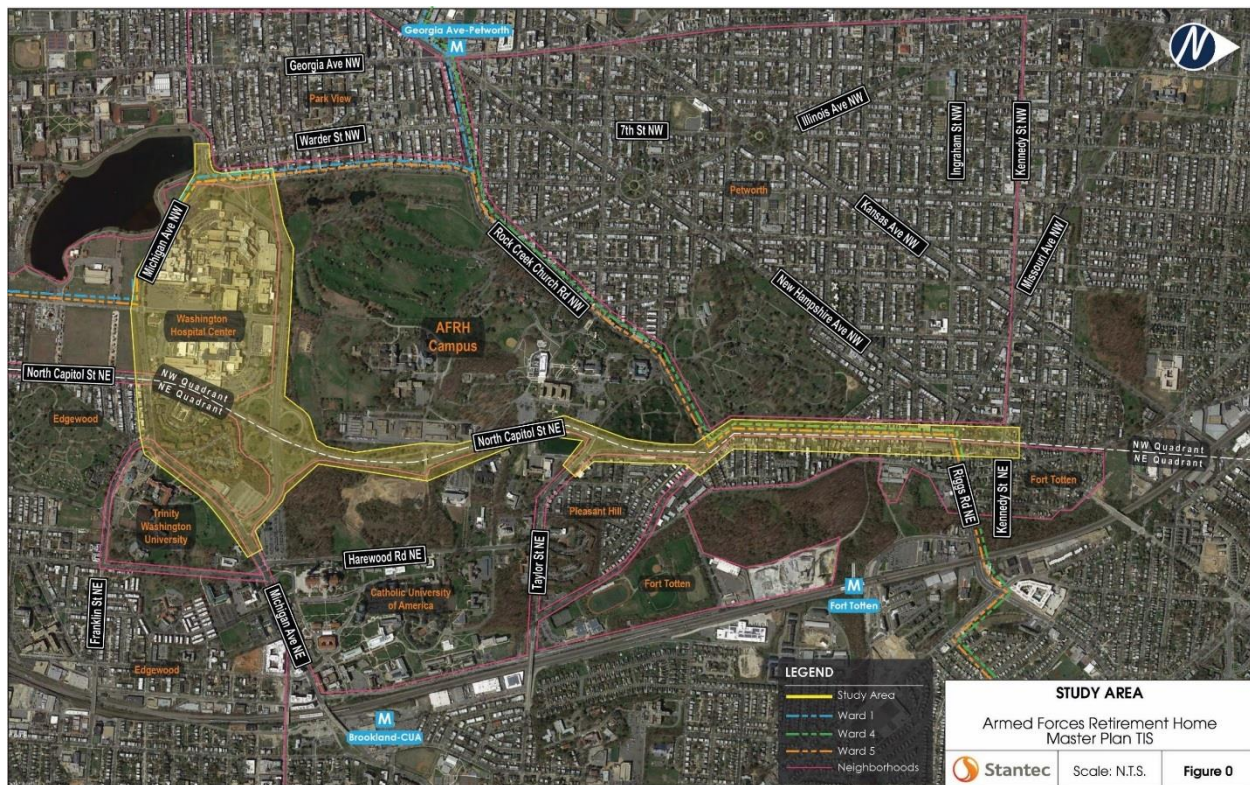


Figure 3-4: Armed Forces Retirement Home Master Plan TIS Study Area

Study Methodology

Stantec conducted a comprehensive data collection program to establish “average day” baseline conditions for vehicular, transit, pedestrian, and cyclist traffic within the study area. The program consisted of automatic traffic recorder counts, manual turning movement counts, and queuing observations. All data were collected on typical weekdays when District schools and Congress were in session.

- **Automatic Traffic Recorder Counts-** Automatic traffic recorder (ATR) counts were collected on Tuesday, June 2, 2015 for 24 consecutive hours at the North Capitol Street and Irving Street, North Capitol Street and Scale Gate Road, and Michigan Avenue NW/Columbia Road NW and Hobart Place NW interchanges.
- **Turning Movement Counts** - Manual turning movement counts were collected during the AM peak period (7:00AM – 10:00AM) and PM peak period (4:00PM – 7:00PM) at the following 14 intersections during the first two weeks of June 2015 while schools were still in session:
 1. North Capitol Street and New Hampshire Avenue (NW/NE) and Kennedy Street NW
 2. North Capitol Street and Missouri Avenue NW/Riggs Road NE
 3. North Capitol Street and Hawaii Avenue NE/Rock Creek Church Road NW
 4. Clermont Drive and Hawaii Avenue NE/Allison Street NE
 5. North Capitol Street/Clermont Drive and Harewood Road NW/Fort Drive NE
 6. North Capitol Street and Michigan Avenue (NW/NE)
 7. Michigan Avenue NE and Franklin Street NE
 8. Michigan Avenue NE and Irving Street NE
 9. Irving Street NW and First Street NW

10. Kenyon Street NW and Park Place NW
 11. Park Place NW and Irving Street
 12. Irving Street NW and Hobart Place NW
 13. Warder Street NW and Columbia Road NW/Michigan Avenue NW
 14. Michigan Avenue NW and First Street NW
- **Queuing** - Queuing observations were conducted on Wednesday, November 18, 2015 in order to determine if additional unmet demand would need to be considered in the traffic analysis. According to *moveDC*, queuing is prevalent within the study area, especially during the PM peak period in the northern portion where North Capitol Street intersects Missouri Avenue NW/Riggs Road NE, New Hampshire Avenue, and Kennedy Street NW. Table 3-9 summarizes where queuing issues were observed during each peak period and reflects the approaches for which additional unmet demand volume was added.

Table 3-8: Observed Queuing

Intersection	Approach	Peak Period
Irving Street NW & First Street NW	Irving Street NW WB	AM
North Capitol Street NE & Michigan Avenue NE	North Capitol Street NB	AM
Irving Street NE & Michigan Avenue NE	Irving Street NE EB Michigan Avenue NE NB	PM
North Capitol Street & Michigan Avenue NE	Michigan Avenue EB North Capitol Street NB	PM
Clermont Drive & Hawaii Avenue	Clermont Drive NB Hawaii Avenue WB	AM & PM AM
North Capitol Street & New Hampshire Avenue NW	New Hampshire Avenue SWB Kennedy Street EB	AM & PM PM
North Capitol Street and Missouri Avenue NW/Riggs Road NE	Missouri Avenue NW North Capitol Street NB Riggs Road NE WB,	AM & PM
North Capitol Street & Harewood Road NW	Harewood Road WB Harewood Road EB	AM PM

Analysis Methodology

- **Merge, Diverge, and Weaving Ramp Segments** - The capacity analyses conducted for the merge, diverge, and weaving ramp segments at the North Capitol Street interchanges with Irving Street (NW and NE) and Scale Gate Road was conducted utilizing Highway Capacity Software (HCS) 2010. Levels of service (LOS) for merge/diverge and weaving segments is defined in terms of density for all cases of stable operation (LOS A-E). When LOS F exists, queues form on both the ramp and main line freeway as demand exceeds capacity. Table 3-10 lists the criteria and description for each level of service.

Table 3-9: Merge, Diverge, and Weaving Segments LOS Criteria

LOS	Density (pc/mi/ln)	Description
A	≤10	Unrestricted operations
B	>10-20	Maneuvers noticeable to drivers
C	>20-28	Decline of influence area speeds
D	>28-35	Intruding influence area turbulence
E	>35	Turbulence felt by all drivers
F	Demand exceeds capacity	Ramp and freeway queues form

Source: 2010 Highway Capacity Manual

- Signalized and Unsignalized Intersections** - While both ramp junctions and weaving segments used HCS 2010 for analysis, capacity analyses performed for the signalized and unsignalized intersections in the study area used Synchro 9 traffic analysis software. This software package provides average control delay, queues, and level of service (LOS) for each lane group and for the overall intersection. LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent upon a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing.

Utilizing Synchro instead of the more basic HCS is preferable for transportation networks with a series of closely-spaced signalized intersections, as well as for networks with complex intersections with more than four legs, such as those within the study area. Under these conditions, Synchro is able to model the effects that the traffic operations (such as poor LOS or extensive queuing) at one intersection have on operations at an adjacent intersection.

LOS can range from A to F and is based on the average control delay per vehicle. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle at signalized intersections and 50 seconds per vehicle at unsignalized intersections, or a v/c ratio greater than 1.0. Table 3-11 summarizes the 2010 HCM delay criteria for signalized and unsignalized intersections.

Table 3-10: LOS Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	
	Signalized	Unsignalized
A	≤ 10.0	≤ 10.0
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	> 80.0 or v/c > 1.0	>50.0 or v/c>1.00

Source: 2010 Highway Capacity Manual

While LOS D or better operations are generally deemed satisfactory from a traffic operations perspective, LOS E or F operations are often indicative of queuing and congestion. Improvements as recommended in this study seek to maintain or improve traffic operations to LOS D or better, with minimal queuing, as reported by Synchro.

2015 Existing Conditions

2015 Existing Condition volumes for the AM and PM peak hours were modeled in HCS 2010 and Synchro 9 to produce capacity analysis results. The results are shown in Table 3-12 for the intersections and Table 3-13 for the merge, diverge, and weave area.

Table 3-11: 2015 Existing Condition LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (85.2)	E (74.2)
North Capitol St & Missouri Ave/Riggs Rd	D (53.7)	D (53.6)
North Capitol St & Rock Creek Church Rd/Buchanan St	A (9.8)	D (41.9)
North Capitol St & Hawaii Ave/Allison St	F (81.6)	E (56.6)
North Capitol St & Harewood Rd NE	A (7.5)	C (31.8)
North Capitol St & Harewood Rd NW	C (21.4)	E (78.6)
SB North Capitol St Ramp & Scale Gate Rd	A (2.9)	A (0.5)
NB North Capitol St Ramp & Scale Gate Rd	A (9.0)	A (7.4)
First St & Irving St	B (19.9)	C (32.2)
North Capitol St & Michigan Ave	C (32.4)	D (39.9)
Franklin St & Michigan Ave	B (17.6)	B (12.5)
Michigan Ave & Irving St	B (17.3)	C (23.8)
Hobart Pl & Irving St	C (21.3)	C (25.8)
Irving St & Ramp from SB North Capitol St	A (4.8)	A (2.1)
Park Pl & Kenyon St	B (13.9)	B (11.0)
Park Pl & Irving St	C (23.7)	C (24.5)
Ramp to Michigan Ave & Hobart Pl	E (38.4)	F (70.1)
Hobart Pl & Michigan Ave & Warder St	B (12.2)	B (12.8)
First St & Michigan Ave	D (36.7)	C (27.4)

Table 3-12: 2015 Existing Condition LOS at for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
North Capitol St & Irving St	Diverge	North Capitol Street NB	Irving Street EB	13.6	B	16.1	B
	Merge	Irving Street WB	North Capitol Street NB	11.9	B	14.7	B
	Weave	North Capitol Street NB		11.6	B	15.6	B
	Diverge	North Capitol Street SB	Irving Street WB	14.5	B	8.9	A
	Merge	Irving Street EB	North Capitol Street SB	12.8	B	10.4	B
	Weave	North Capitol Street SB		10.8	B	6.3	A
	Diverge	Irving Street EB	North Capitol Street SB	9.7	A	15.8	B
	Merge	North Capitol Street NB	Irving Street EB	9.6	A	12.5	B
	Weave	Irving Street EB		9.5	A	12.6	B
	Diverge	Irving Street WB	North Capitol Street NB	12.6	B	6.8	A
	Weave	Irving Street WB		10.7	A	5.8	A
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	13.3	B	17.1	B
	Merge	Scale Gate Road	North Capitol Street NB	12.0	B	15.6	B
	Diverge	North Capitol Street SB	Scale Gate Road	16.3	B	9.6	A
	Merge	Scale Gate Road	North Capitol Street SB	13.4	B	8.6	A

Transit Facilities

Many forms of transit are available in the Washington, DC metropolitan regions. The Washington Metropolitan Area Transit Authority (WMATA) operates the two intra-city transit systems, Metrorail and Metrobus. Intercity includes MARC (the Maryland Transit Authority's commuter rail system), VRE (Virginia Railway Express), and Amtrak. However, the AFRH-W site is located in a relatively isolated area within the broad DC transit network.

Metrobus and Metrorail routes and schedules were obtained from WMATA. Metrobus stops and distance from AFRH-W were located during field visits (see Table 3-14 and Figure 3-5). No bus service operates along the site's Irving Street NW or North Capitol Street frontages, and the closest bus stop is located within the Washington Hospital Center campus, approximately 2,000 feet (0.38 miles) from the approximate center of the site. Given that the typical acceptable walking distance for a bus service is 0.25 miles, there are no existing bus services that are considered to be within walking distance of the site. Furthermore, a walking distance of 0.5 miles is considered acceptable for a high-frequency rail service, like Metro. However, the AFRH-W site is located approximately 1 mile from the Brookland-CUA Metro Station (Red Line) and approximately 1.2 miles from the Columbia Heights Metro Station (Green/Yellow Lines). Thus, the site is considered to be outside the acceptable walking distance for high-frequency rail transit.

Table 3-13: Existing Transit Services in Vicinity of AFRH-W

Route Number	Route/Station Name	Distance from AFRH-W (Miles)
Metrobus Route 80	North Capitol Street Line	0.6
Metrobus Route H1	Brookland to Potomac Park	0.6
Metrobus Route H2/H3/H4	Crosstown Line	0.5
Metrobus Route D8	Hospital Center Line	0.4
Metrorail Green/Yellow Lines	Columbia Heights or Georgia Avenue-Petworth Stations	1.2
Metrorail Red Line	Brookland-CUA Station	1.1

- Buses** - Existing bus route capacity was determined by estimating the total number of seats by route utilizing information contained in the *2010 Metrobus Fleet Management Plan* which indicates that the average non-articulated bus contains 41 seats. Current timetables provided on the WMATA website were used to determine the number of buses that serve the nearest bus stop during the AM and PM peak periods. Ridership (demand) was estimated utilizing 2015 daily ridership data for each route provided by WMATA. According to the *2010 Metrobus Fleet Management Plan*, 31.4 percent of daily ridership occurs during the four-hour morning peak hour and 33.9 percent occurs during the four-hour evening peak hour. Daily ridership was multiplied by the above percentages and divided by four to estimate the AM and PM peak hour ridership for each route. Northbound/southbound splits were determined utilizing the ratio of bus service in each direction (WMATA 2010).

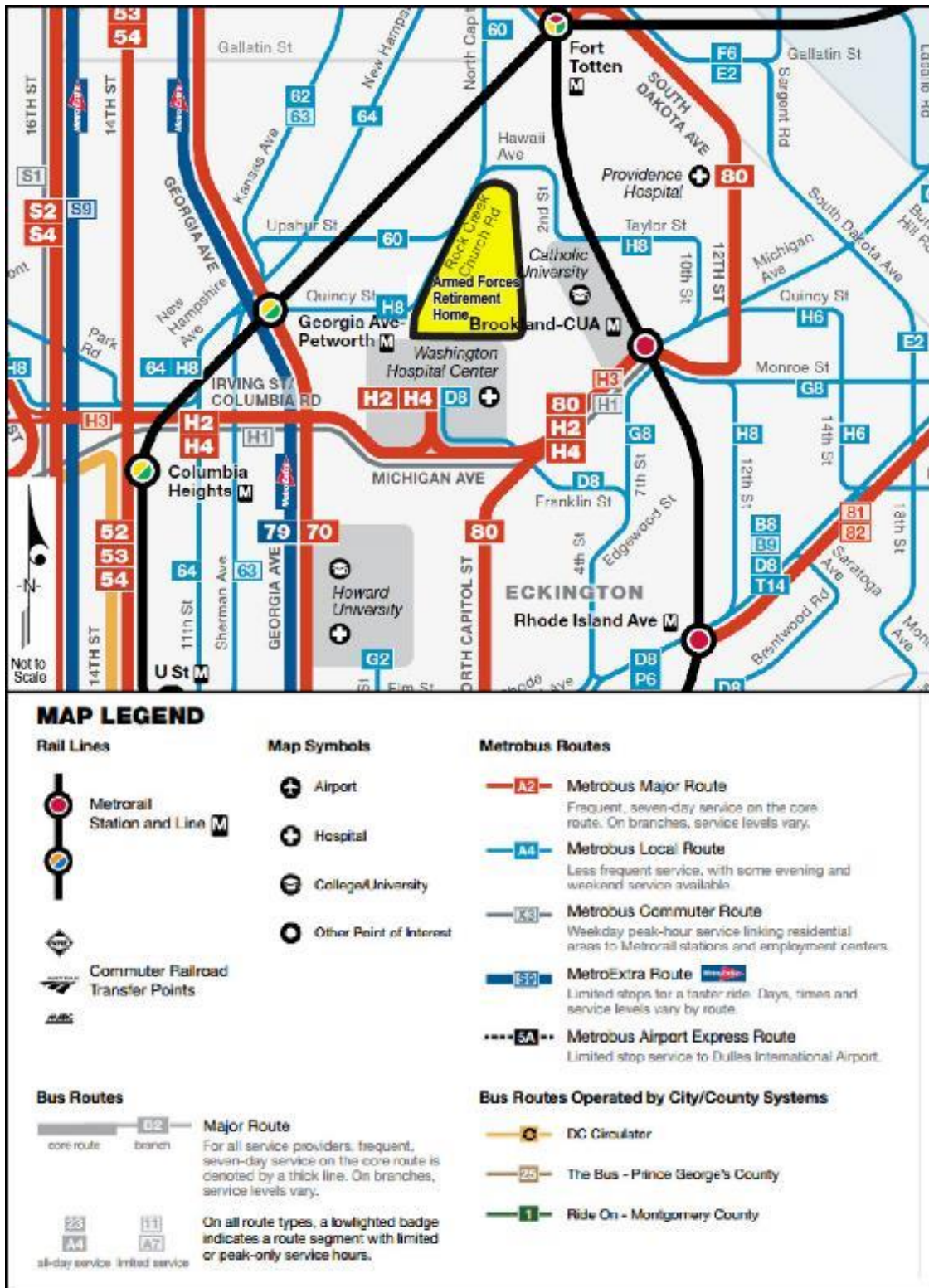


Figure 3-5: Metrobus and Metrorail Service in the Vicinity of AFRH-W (WMATA 2016)

The results of the capacity analysis indicate that the majority of the routes are at or above capacity (see Table 3-15). According to WMATA's 2000 *Metrobus Regional Bus Services Performance Assessment Report*, a rider versus capacity (R/C) ratio of 1.2 is acceptable for a radial service (such as Routes 80, D8, and H1), and a R/C ratio of 1.1 is acceptable for a crosstown service (such as Routes H2, H3, H4). These ratios account for passengers which may have to stand during peak periods (WMATA 2000). Applying these R/C ratios to the data, it can be seen that Routes 80 and D8 operate above the accepted R/C ratios during the PM peak hour.

Table 3-14: Existing Bus Route Capacity

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)	Capacity (pass/hr)	R/C	Acceptable?
NB/SB	80	AM	NB	213	205	1.04	YES
			SB	340	328	1.04	YES
		PM	NB	326	246	1.32	NO
			SB	271	205	1.32	NO
	H1	AM	NB	0	0	N/A	N/A
			SB	51	164	0.31	YES
		PM	NB	55	123	0.45	YES
			SB	0	0	N/A	N/A
	D8	AM	NB	157	164	0.96	YES
			SB	196	205	0.96	YES
		PM	NB	191	123	1.55	NO
			SB	191	123	1.55	NO
TOTAL	AM	NB	370	369	1.00	YES	
		SB	587	697	0.84	YES	
	PM	NB	571	492	1.16	YES	
		SB	462	328	1.41	NO	
EB/WB	H2, H3, H4	AM	EB	172	164	1.05	YES
			WB	345	328	1.05	YES
		PM	EB	300	287	1.05	YES
			WB	258	246	1.05	YES

- Metro rail** - Given the proximity of the AFRH-W site to the Red and Yellow/Green Lines, it is anticipated that the Brookland-CUA and Columbia Heights stations would be most utilized for site Metro rail trips. 2015 daily weekday passenger boarding data was obtained from WMATA for those stations. WMATA's Metro rail Station Access and Capacity Study indicates that 60 percent of daily ridership occurred during the peak periods (WMATA 2008). Therefore, it is assumed that 20 percent of daily boarding's occur during the AM and PM peak hours.

Metro rail system capacity is constrained by the capacity of the rail consists, rather than the stations. Therefore, to estimate capacity of the Red and Yellow/Green lines the passenger capacity per car (120) was multiplied by the number of cars in the consist (minimum of six) and the number of trains in the peak hour. Considering an average headway of five minutes, each line should be able to accommodate a minimum of 17,280 passengers during the AM and PM peak hours. It should be noted that eight car trains operate on the both lines as well, which would increase the overall line capacities.

Based on the 2015 boarding data, the Columbia Heights station experiences a peak hour demand of approximately 2,500 passengers per hour, while the Brookland-CUA station experiences a peak hour demand of approximately 1,350 passengers per hour. When compared to the minimum line capacity of 17,280 passengers, the Brookland-CUA and Columbia Heights stations would not experience capacity issues under typical weekday conditions.

- **Commuter Rail** - Commuter train service is available into the city from the Maryland Commuter Rail (MARC), Virginia Railway Express (VRE), and Amtrak. The Maryland Department of Transportation operates the MARC inter-city service into Union Station, and VRE operates two, weekday-only, intercity lines to Union Station. However, Union Station is located approximately five miles from the AFRH-W site and thus these are not considered in the transit capacity analysis.
- **Pedestrian and Bike Facilities** - The AFRH-W site is located in an area with limited existing pedestrian and bicycle facilities. Additional and enhanced facilities will be required to connect the site to adjacent land uses, such as CUA and the Washington Hospital Center, and transit options.

Limited pedestrian and bicycle facilities are provided within the immediate area of the site. According to the DC Bicycle Master Plan, Irving Street is designated as a signed bicycle route with a multi-use trail. However, the trail consists of a relatively narrow (five to six feet) concrete sidewalk along the south side of Irving Street between the intersection with Hobart Place and Michigan Avenue NE. Crosswalks are provided at all roadway crossings, including the ramps at the North Capitol Street interchange, where pedestrian crossing warning signs are also provided. An unsignalized crosswalk is provided at Kenyon Street to connect the sidewalk on Kenyon Street to the trail on Irving Street. Based on field observations, all crossings appear to have ADA compliant curb ramps, with the exception of the unsignalized crossing at Kenyon Street.

A five-foot sidewalk is also provided on the north side of the Scale Gate Road overpass. However, the sidewalk does not connect to any larger network and no curb ramps or crosswalks are provided.

While pedestrian facilities are relatively limited in the area immediately adjacent to the site, sidewalks are provided on both sides of study area roadway network streets with the exception of Irving Street and North Capitol Street between Michigan Avenue and Allison Street. No formal bicycle facilities (bike lanes or sharrows) are provided on any of the study area roadways.

3.7.1 Impacts to Traffic

A traffic analysis was performed, which studied the impact to the local roadway network under the existing conditions (background conditions); the build-out year with the existing planned developments, which does not include implementing the Master Plan (No Action Alternative); the 2045 build-out year with existing planned developments, existing transportation network and the implementation of the Master Plan (2045 Master Plan Alternative with Base Network); and the 2045 build-out year with existing planned developments, modifications to the transportation network identified in the 2016 Crosstown Multimodal Transportation Study, and the implementation of the Master Plan (2045 Master Plan Alternative with Crosstown Study Network).

No Action Alternative

The No Action Alternative includes future anticipated peak hour traffic volumes for roadways near the site. These volumes are the sum of the existing traffic volumes, plus the background growth in the area and the approved, un-built developments in the study area. Under this scenario, new development would not occur on AFRH-W property. The selected horizon year of 2045 corresponds to the horizon year identified in the SEIS.

Forecast data was obtained from the Metropolitan Washington Council of Governments (MWCOC) model to determine the background growth factor. This model uses future population and employment projections that reflect a regional perspective on growth and development. In addition to background growth, DDOT identified several nearby redevelopment projects that would likely impact traffic within the study area. These include:

- Catholic University of America Master Plan
- Catholic University of America South Campus Redevelopment
- VA Medical Center Master Plan
- 818 Michigan Avenue
- McMillian Sand Filtration Site
- Howard University Campus Master Plan
- Michigan at Irving PUD

Project background growth volumes and development volumes were summed to obtain 2045 Background/No Build Condition volumes for the AM and PM peak hours (Table 3-16). These volumes were modeled in HCS 2010 and Synchro 9 to produce capacity analysis results. These models also included all proposed signalized intersections and roadway improvements recommended in the transportation impact studies for the above-referenced development (Table 3-17). In addition, signal timing and coordination was optimized across the study area roadway network because it was assumed that signal operations would be updated before 2045.

Table 3-15: 2045 No Action Alternative LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (143.4)	F (188.3)
North Capitol St & Missouri Ave/Riggs Rd	F (102.2)	F (141.7)
North Capitol St & Rock Creek Church Rd/Buchanan St	D (41.6)	E (75.6)
North Capitol St & Hawaii Ave/Allison St	F (195.1)	F (160.4)
North Capitol St & Harewood Rd NE	A (5.0)	E (71.5)
North Capitol St & Harewood Rd NW	E (56.1)	F (205.3)
SB North Capitol St Ramp & Scale Gate Rd	A (2.9)	A (0.6)
NB North Capitol St Ramp & Scale Gate Rd	A (9.0)	A (7.0)
First St & Irving St	C (25.4)	E (58.2)
North Capitol St & Michigan Ave	F (122.8)	F (110.4)
Franklin St & Michigan Ave	B (15.7)	B (11.9)

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
Michigan Ave & Irving St	B (19.4)	C (22.3)
Hobart Pl & Irving St	B (14.2)	B (16.8)
Irving St & Ramp from SB North Capitol St	B (10.3)	A (2.9)
Park Pl & Kenyon St	B (17.1)	B (12.5)
Park Pl & Irving St	C (23.7)	C (24.5)
Ramp to Michigan Ave & Hobart Pl	F (195.8)	F (219.1)
Park Pl & Hobart Pl	F (111.9)	B (10.0)
Hobart Pl & Michigan Ave & Warder St	A (10.0)	A (9.9)
First St & Michigan Ave	E (68.4)	E (78.5)
Irving St & Michigan At Irving PUD Driveway	B (13.9)	C (20.6)
Michigan Ave & PU-DO Out	A (0.3)	A (1.1)
Michigan Ave & Half St	B (14.7)	A (7.6)

Table 3-16: 2045 No Action Alternative LOS at Studied Intersection for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak	LOS	PM Peak	LOS
	Type	From	To	Density (pc/mi/ln)		Density (pc/mi/ln)	
North Capitol St & Irving St	Diverge	North Capitol Street NB	Irving Street EB	17.2	B	19.4	B
	Merge	Irving Street WB	North Capitol Street NB	14.0	B	19.2	B
	Weave	North Capitol Street NB		14.3	B	23.7	C
	Diverge	North Capitol Street SB	Irving Street WB	18.2	B	10.7	B
	Merge	Irving Street EB	North Capitol Street SB	15.7	B	11.6	B
	Weave	North Capitol Street SB		15.6	B	8.4	A
	Diverge	Irving Street EB	North Capitol Street SB	11.4	B	20.6	C
	Merge	North Capitol Street NB	Irving Street EB	11.6	B	15.7	B
	Weave	Irving Street EB		10.2	A	20.3	B
	Diverge	Irving Street WB	North Capitol Street NB	16.2	B	8.8	A

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
	Weave	Irving Street WB		16.0	B	8.5	A
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	15.7	B	22.1	C
	Merge	Scale Gate Road	North Capitol Street NB	13.9	B	19.9	B
	Diverge	North Capitol Street SB	Scale Gate Road	19.7	B	11.8	B
	Merge	Scale Gate Road	North Capitol Street SB	16.3	B	10.4	B

Master Plan Alternative

The site is expected to be fully developed by 2045 with a mix of uses including residential condominiums and apartments, general and medical offices, retail, assisted living, and hotel and conference center. The Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th ed. was used to estimate the total number of trips that would be generated by each use, as shown in Table 3-18. It should be noted that because the project is in the preliminary phase, only general square footages are available. The number of residential units, assisted living beds, and hotel rooms were assumed based on a comparison of square footages for residential, assisted living, and hotel rooms in the general area. The actual square footage, number of units, and land use may change as the project progresses.

Table 3-17: Mixed-Use Development (Zone A) Trip Generation (With Trip Credits)

Land Use	ITE LUC	Quantity	Methodology	AM			PM		
Residential Apartments	220	2,280,477 SF 2,280 Units*	Equation	224	897	1,121	827	445	1272
Non-Auto Trip Credit (37%)				83	332	415	306	165	471
Subtotal New Residential Vehicle Trips				141	565	706	521	280	801
Office	710	1,191,391 SF	Equation	1,222	167	1,389	240	1,173	1,413
Medical Office	720	290,650 SF	Average Rate/ Equation	549	146	695	213	548	761
Subtotal Office				1,771	313	2,084	453	1,721	2,174
Non-Auto Trip Credit (25%)				443	78	521	113	430	543
Subtotal New Office Vehicle Trips				1,328	235	1,563	340	1,291	1,631
Retail	820	264,086 SF	Equation	175	107	282	551	597	1,148
Assisted Living	254	214,000 SF 285 Rooms	Average Rate	26	14	40	59	75	134

Land Use	ITE LUC	Quantity	Methodology	AM			PM		
Hotel	310	126,391 SF 235 Rooms	Average Rate	73	52	125	72	69	141
Heating Plant (Retail)	820	40,798 SF	Equation	56	34	90	158	171	329
Subtotal New Vehicle Trips				1,799	1,007	2,806	1,701	2,483	4,184
30% Retail Pass-By (from ITE Trip Generation Manual User Guide)				0	0	0	222	222	443
Total				1,799	1,007	2,806	1,479	2,261	3,741

*Assume 1,000 SF per unit based on assessment of nearby proposed development.

**Heating plant assumed as retail, to be conservative.

Typically, initial trip generation estimates assume that all trips to the site are new auto trips. However, many developments can claim a reduction or “credit” in new trips for pass-by trips and trips made by alternative modes, such as transit, walking, or bicycling. ITE defines pass-by trips as those trips that are made as intermediate stops on the way from an origin to a primary trip destination without a route diversion, and are calculated for retail uses only. Using the ITE Trip Generation Manual *User Guide and Handbook*, 9th ed., it was determined that a 30 percent retail pass-by rate was applicable to this site during the PM peak hour. This means that of the total number of site-generated trips, 30 percent would already be on the roadway network during the PM peak hour.

Another credit can be claimed for trips that will be made by modes other than driving, including transit, bicycle, and walking. A non-auto driver mode split for the general and medical offices and institutional uses was calculated utilizing the 2005 Development Related Ridership Survey by WMATA. A non-auto driver mode split for residential uses was calculated utilizing Census Transportation Planning Package (CTPP) data for census tracts 23.01 and 23.02 (Table 3-19).

Table 3-18: Targeted Mode Splits

Mode	Split – Office/Medical Office/Institutional/Retail	Split – Residential
Auto	75%	63%
Bus	9%	12%
Metro	10%	21%
Walk/Bike/Other	6%	4%

The two credits were applied to the initial trip generation rates to calculate the total number of new vehicle trips that are expected to access the development. A total (both ingress and egress) of 2,806 vehicle trips are expected in the AM peak hour and 3,741 vehicle trips are expected in the PM peak hour.

Trip Distribution - In order to determine trip distribution, origin and destination trip tables were utilized to estimate the distribution of trips on the various ingress and egress points within the study area by peak period, assuming that trip distribution would not be altered significantly between 2040 (the model horizon year) and 2045 (the Master Plan horizon year). The distribution at intersections was calculated

using the regional model results with refinements based on peak hour volumes. It should also be noted that non-auto modes were distributed as pedestrians on the network to show activity to/from existing transit stops.

Trip Assignment - Trips to the study area network that were generated based on the trip distribution discussed previously. The trip assignments include vehicle and pedestrian trips only, and take credits for pass-by and alternative mode trips. These volumes were added to the No Action Alternative volumes to obtain 2045 Future Build Condition Volumes.

Master Plan Alternative with Existing Transportation Network

Total traffic volumes were determined by adding the site traffic volumes to the No Action volumes. The results of the intersection and merge/diverge/weave analysis are summarized in Table 3-20 and Table 3-21, below. Under the Master Plan Alternative, 12 of the intersections within the study area would operate at an unacceptable LOS during one or both peak hours. This would result in a major, long-term, adverse impact.

Table 3-19: 2045 Master Plan Alternative LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (199.9)	F (317.2)
North Capitol St & Missouri Ave/Riggs Rd	F (161.5)	F (234.0)
North Capitol St & Rock Creek Church Rd/Buchanan St	E (70.7)	F (155.3)
North Capitol St & Hawaii Ave/Allison St	F (275.5)	F (247.7)
North Capitol St & Harewood Rd NE	D (35.4)	F (139.5)
North Capitol St & Harewood Rd NW	F (137.9)	F (293.8)
SB North Capitol St Ramp & Scale Gate Rd	F (64.0)	D (32.7)
NB North Capitol St Ramp & Scale Gate Rd	F (353.3)	F (4274.2)
First St/Site Driveway 2 & Irving St	E (78.9)	F (240.7)
North Capitol St & Michigan Ave	F (122.8)	F (110.4)
Franklin St & Michigan Ave	B (15.7)	B (11.9)
Michigan Ave & Irving St	B (20.0)	C (26.6)
Hobart Pl & Irving St	B (17.6)	C (20.6)
Irving St & Ramp from SB North Capitol St	B (11.7)	A (3.2)
Park Pl & Kenyon St	C (25.5)	B (11.0)
Park Pl & Irving St	C (25.6)	C (20.9)
Ramp to Michigan Ave & Hobart Pl	F (195.8)	F (219.1)
Park Pl & Hobart Pl	F (2328.6)	F (106.6)
Hobart Pl & Michigan Ave & Warder St	A (10.0)	A (9.9)
First St & Michigan Ave	E (68.4)	E (78.5)
Irving St & Michigan At Irving PUD Driveway	B (13.9)	C (20.6)
Michigan Ave & PU-DO Out	A (0.3)	A (1.1)
Michigan Ave & Half St	B (14.7)	A (7.6)
Irving St & Site Driveway 1	A (0.2)	A (0.4)
Irving St & Site Driveway 3	C (22.4)	D (35.5)

Table 3-20: 2045 Master Plan Alternative LOS at for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
North Capitol St & Irving St	Diverge	North Capitol Street NB	Irving Street EB	19.2	B	22.0	C
	Merge	Irving Street WB	North Capitol Street NB	16.3	B	21.8	C
	Weave	North Capitol Street NB		18.6	B	29.9	D
	Diverge	North Capitol Street SB	Irving Street WB	18.2	B	13.0	B
	Merge	Irving Street EB	North Capitol Street SB	15.8	B	13.9	B
	Weave	North Capitol Street SB		15.2	B	10.3	B
	Diverge	Irving Street EB	North Capitol Street SB	12.5	B	23.2	C
	Merge	North Capitol Street NB	Irving Street EB	12.1	B	16.9	B
	Weave	Irving Street EB		10.6	A	24.1	C
	Diverge	Irving Street WB	North Capitol Street NB	16.7	B	9.7	A
	Weave	Irving Street WB		17.6	B	10.2	A
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	17.2	B	24.0	C
	Merge	Scale Gate Road	North Capitol Street NB	15.3	B	26.4	C
	Diverge	North Capitol Street SB	Scale Gate Road	22.3	C	12.4	B
	Merge	Scale Gate Road	North Capitol Street SB	19.7	B	15.1	B

Mitigation Measures

DDOT requires that mitigation be provided for intersections that experience an overall increase in delay of more than five seconds per vehicle. However, since the study area roadway network experiences

significant congestion in the 2045 No Build Condition, any additional trips added to the network would result in an exponential increase delay, and would likely require mitigation measures, such as additional travel lanes, that would not be appropriate or desirable for the study area transportation network. Therefore, mitigation measures that would address the additional intersection delay while considering multi-modal transportation needs and potential ROW impacts were developed and evaluated. These mitigation measures include:

- Upgrade all the study area signalized intersections to be fully actuated and optimize phasing and offsets.
- Implement traffic adaptive or demand responsive signals on North Capitol Street.
- Provide an additional northbound through lane at the intersection of North Capitol Street and New Hampshire Avenue NE.
- Eliminate the westbound Buchanan Street approach and the Hawaii Avenue northbound left-turn movement at the intersection with North Capitol Street.
- Provide an additional southbound through lane at the intersection of North Capitol Street and Harewood Road.
- Replace the Scale Gate Road bridge over North Capitol Street to incorporate two lanes in each direction, as well as full sidewalks. Signalize the diamond interchange ramp intersections with Scale Gate Road.
- Modify the proposed North Capitol Street/Irving Street interchange to eliminate the free ramp movements on Irving Street to provide safer and more controlled pedestrian/ bicycle crossing. It should be noted that, at a minimum, the improvements to the northwest quadrant of the interchange will be required.
- At the intersection of Irving Street NW and First Street NW, provide an additional westbound left-turn lane, two northbound left-turn lanes, and an eastbound right-turn lane; OR, divert vehicles from the intersection of First Street NW and Irving Street NW by providing a secondary entrance to the Washington Hospital Center Campus from the North Capitol Street/Irving Street interchange.
- Provide a double left-turn lane at the intersection of Irving Street NW and Driveway 3. All traffic entering the site from eastbound Irving Street NW must do so at this intersection.
- Signalize the intersections of Park Place NW and Hobart Place NW, Hobart Place NW and the Ramp to Michigan Avenue, and Michigan Avenue NW and the Ramp from Hobart Place/Park Place NW. Widen the Ramp to Michigan Avenue NW.
- Provide an additional southbound left-turn lane and westbound right-turn lane at the intersection of Michigan Avenue NW and First Street NW

No developer has been selected yet; therefore a final phasing plan is not available. Therefore, a phasing strategy for the proposed mitigation measures was developed based on trip thresholds. The phasing strategy is intended to outline the mitigation measures that would be required when the site meets the threshold of 20 percent, 40 percent, 60 percent, and 80 percent of full build site generated vehicle trips. Table 3-22 identifies which mitigation measure would be applicable to each threshold. A developer may choose to implement the mitigation measures identified in this study, or work with DDOT to identify other potential measures that could be implemented in place of the mitigation options presented in this study.

Table 3-21: 2045 Master Plan Alternative Mitigation Measure Phasing

Threshold	Mitigation Measure
20%	<p>Upgrade all study area signalized intersections to be fully actuated and optimize phasing and offsets (DDOT).</p> <p>At the intersection of Irving Street NW and First Street NW, provide an additional westbound left-turn lane, two northbound left-turn lanes, and an eastbound right-turn lane; OR, Divert vehicles from the intersection of First Street NW and Irving Street NW by providing a secondary entrance to the Washington Hospital Center Campus from the North Capitol Street/Irving Street interchange. (Developer)</p> <p>Provide a double left-turn lane at the intersection of Irving Street NW and Driveway 3. All traffic entering the site from eastbound Irving Street NW must do so at this intersection. (Developer)</p> <p>Signalize the intersections of Park Place NW and Hobart Place NW, Hobart Place NW and the Ramp to Michigan Avenue, and Michigan Avenue NW and the Ramp from Hobart Place/Park Place NW. Widen the Ramp to Michigan Avenue NW (DDOT).</p>
40%	<p>Provide an additional northbound through lane at the intersection of North Capitol Street and New Hampshire Avenue NE (Developer).</p> <p>Eliminate the Hawaii Avenue northbound left-turn movement at the intersection with North Capitol Street (Developer).</p>
60%	<p>Replace the Scale Gate Road bridge over North Capitol Street to incorporate two lanes in each direction, as well as full sidewalks. Signalize the diamond interchange ramp intersections with Scale Gate Road (Developer).</p> <p>Provide an additional southbound left-turn lane and westbound right-turn lane at the intersection of Michigan Avenue NW and First Street NW (Developer).</p>
80%	<p>Provide an additional southbound through lane at the intersection of North Capitol Street and Harewood Road (Developer).</p> <p>Implement traffic adaptive or demand responsive signals on North Capitol Street (DDOT).</p>

The results of the capacity analysis for phase threshold is detailed in the Traffic Technical Report. Table 3-23 and Table 3-24 below show the results of the intersection and merge/diverge/weave capacity analyses for the full build.

Table 3-22: 2045 Master Plan Alternative with Mitigation LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (201.9)	F (317.1)
North Capitol St & Missouri Ave/Riggs Rd	F (131.6)	F (209.2)
North Capitol St & Rock Creek Church Rd/Buchanan St	D (43.3)	E (77.8)
North Capitol St & Hawaii Ave/Allison St	F (189.0)	F (140.4)
North Capitol St & Harewood Rd NE	B (10.9)	F (112.9)
North Capitol St & Harewood Rd NW	D (45.1)	F (270.8)
SB North Capitol St Ramp & Scale Gate Rd	A (9.8)	B (14.0)
NB North Capitol St Ramp & Scale Gate Rd	C (28.7)	E (60.9)
First St/Site Driveway 2 & Irving St	D (39.0)	F (134.6)
North Capitol St & Michigan Ave	F (132.3)	F (138.7)
Franklin St & Michigan Ave	C (20.6)	B (15.2)
Michigan Ave & Irving St	B (16.9)	B (17.6)

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
Hobart Pl & Irving St	B (17.6)	B (17.5)
Irving St & Ramp from NB North Capitol St	B (17.2)	B (16.4)
Irving St & Ramp from SB North Capitol St	B (15.2)	A (9.7)
Park Pl & Kenyon St	C (28.2)	B (15.1)
Park Pl & Irving St	C (31.9)	C (21.6)
Ramp to Michigan Ave & Hobart Pl	C (28.0)	C (27.0)
Park Pl & Hobart Pl	C (33.6)	B (15.7)
Hobart Pl & Michigan Ave & Warder St	B (13.0)	A (9.0)
First St & Michigan Ave	E (68.4)	D (41.9)
Irving St & Michigan At Irving PUD Driveway	A (4.0)	A (5.0)
Michigan Ave & PU-DO Out	A (0.3)	A (8.4)
Michigan Ave & Half St	A (4.6)	B (13.2)
Irving St & Site Driveway 1	A (0.2)	A (0.4)
Irving St & Site Driveway 3	B (13.2)	B (18.2)

Table 3-23: 2045 Master Plan Alternative with Mitigation LOS at for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
North Capitol St & Irving St	Diverge	North Capitol Street NB	Irving Street EB	19.2	B	22.0	C
	Merge	Irving Street WB	North Capitol Street NB	16.3	B	21.8	C
	Weave	North Capitol Street NB		18.6	B	29.9	D
	Diverge	North Capitol Street SB	Irving Street WB	18.3	B	13.0	B
	Merge	Irving Street EB	North Capitol Street SB	15.8	B	13.9	B
	Weave	North Capitol Street SB		15.2	B	10.4	B
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	17.2	B	24.0	C
	Merge	Scale Gate Road	North Capitol Street NB	15.3	B	26.4	C

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
	Diverge	North Capitol Street SB	Scale Gate Road	21.3	C	12.4	B
	Merge	Scale Gate Road	North Capitol Street SB	18.9	B	15.1	B

Master Plan Alternative with Crosstown Study Network

DDOT is currently engaging in a study that will redefine the Irving Street and Michigan Avenue corridors within the AFRH-W study area. As such, DDOT requested that the impact of the proposed project be evaluated on a potential modified network utilizing the preliminary concepts from the 2016 Crosstown Multimodal Transportation Study.

2045 No Action Alternative with Crosstown Study Network

Background traffic volumes as well as adjacent site volumes were distributed on the revised Crosstown Study network. Table 3-25 and Table 3-26 show the results of the intersection and merge/diverge/weave area capacity analyses, respectively.

Table 3-24: 2045 No Action Alternative with Crosstown Study Network LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (171.2)	F (195.6)
North Capitol St & Missouri Ave/Riggs Rd	F (105.8)	F (143.1)
North Capitol St & Rock Creek Church Rd/Buchanan St	D (40.8)	E (75.9)
North Capitol St & Hawaii Ave/Allison St	F (197.8)	F (159.5)
North Capitol St & Harewood Rd NE	A (5.0)	E (72.1)
North Capitol St & Harewood Rd NW	D (51.9)	F (203.1)
SB North Capitol St Ramp & Scale Gate Rd	A (2.9)	A (0.6)
NB North Capitol St Ramp & Scale Gate Rd	A (8.8)	A (7.0)
First St & Irving St	C (27.9)	E (62.1)
North Capitol St & Michigan Ave	F (122.7)	F (115.2)
Franklin St & Michigan Ave	B (15.5)	B (11.9)
Michigan Ave & Irving St	B (17.6)	B (14.2)
Hobart Pl & Irving St	B (17.6)	B (17.5)
North Capitol St & North Capitol Connector	C (26.0)	B (12.6)
Irving St & North Capitol Connector	F (146.6)	C (27.4)
Park Pl & Kenyon St	C (20.6)	B (15.1)
Park Pl & Irving St	C (20.1)	B (16.8)
Park Pl & Michigan Ave	C (24.9)	D (39.0)

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
Park Pl & Hobart Pl	C (33.6)	B (15.7)
Hobart Pl & Michigan Ave & Warder St	B (10.3)	A (8.5)
First St & Michigan Ave	E (68.1)	F (89.9)
Irving St & Michigan At Irving PUD Driveway	A (3.8)	A (3.3)
Michigan Ave & PU-DO Out	A (0.3)	A (1.1)
Michigan Ave & Half St	A (6.1)	B (8.0)

Table 3-25: 2045 No Action Alternative with Crosstown Study Network at for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	15.7	B	22.1	C
	Merge	Scale Gate Road	North Capitol Street NB	13.9	B	19.9	B
	Diverge	North Capitol Street SB	Scale Gate Road	19.7	B	11.8	B
	Merge	Scale Gate Road	North Capitol Street SB	16.3	B	10.4	B

2045 Crosstown Study Full Build Condition – Without Mitigation

The 2045 Crosstown Study Build Condition reflects anticipated modifications to the study area roadway network with the additional AFRH-W site traffic. The results of the intersection and merge/diverge/weave analysis are summarized in Table 3-27 and Table 3-28, below. Under the Master Plan Alternative with Crosstown Study Network, 13 of the intersections within the study area would operate at an unacceptable LOS during one or both peak hours. This would result in a major, long-term, adverse impact.

Table 3-26: 2045 Master Plan Alternative with Crosstown Study Network LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (203.3)	F (321.4)
North Capitol St & Missouri Ave/Riggs Rd	F (167.0)	F (234.4)
North Capitol St & Rock Creek Church Rd/Buchanan St	E (70.2)	E (75.9)
North Capitol St & Hawaii Ave/Allison St	F (277.4)	F (245.8)
North Capitol St & Harewood Rd NE	A (5.0)	F (141.5)
North Capitol St & Harewood Rd NW	F (114.3)	F (292.6)

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
SB North Capitol St Ramp & Scale Gate Rd	F (387.0)	A (2.1)
NB North Capitol St Ramp & Scale Gate Rd	F (112.8)	F (4068.2)
First St/Site Driveway 2 & Irving St	F (175.3)	F (374.7)
North Capitol St & Michigan Ave	F (171.4)	F (157.2)
Franklin St & Michigan Ave	B (18.9)	B (12.7)
Michigan Ave & Irving St	C (21.6)	B (15.5)
Hobart Pl & Irving St	B (17.6)	B (17.5)
North Capitol St & North Capitol Connector	E (55.6)	F (87.1)
Irving St & North Capitol Connector	F (282.0)	F (85.4)
Park Pl & Kenyon St	C (24.4)	C (32.9)
Park Pl & Irving St	C (32.4)	B (17.5)
Park Pl & Michigan Ave	C (33.4)	D (54.3)
Park Pl & Hobart Pl	C (33.6)	B (15.7)
Hobart Pl & Michigan Ave & Warder St	C (24.7)	C (23.2)
First St & Michigan Ave	F (92.3)	F (159.2)
Irving St & Michigan At Irving PUD Driveway	A (3.7)	A (3.0)
Michigan Ave & PU-DO Out	A (0.2)	A (3.5)
Michigan Ave & Half St	A (8.5)	C (33.6)
Irving St & Site Driveway 1	A (0.5)	A (0.4)
Irving St & Site Driveway 3	B (15.8)	C (34.2)

Table 3-27: 2045 Master Plan Alternative with Crosstown Study Network at for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	17.3	B	24.2	C
	Merge	Scale Gate Road	North Capitol Street NB	15.3	B	25.3	C
	Diverge	North Capitol Street SB	Scale Gate Road	21.3	C	12.8	B
	Merge	Scale Gate Road	North Capitol Street SB	18.9	B	14.3	B

2045 Crosstown Study Full Build with Mitigation

DDOT requires that mitigation be provided for intersections that experience an overall increase in delay of more than five seconds per vehicle. However, since the study area roadway network experiences significant congestion in the 2045 No Build Condition, any additional trips added to the network would result in an exponential increase delay, and would likely require mitigation measures, such as additional travel lanes, that would not be appropriate or desirable for the study area transportation network. Therefore, Stantec developed and evaluated mitigation measures that would address the additional intersection delay while considering multi-modal transportation needs and potential ROW impacts. These mitigation measures include:

- Upgrade all the study area signalized intersections to be fully actuated and optimize phasing and offsets.
- Implement traffic adaptive or demand responsive signals on North Capitol Street.
- Provide an additional northbound through lane at the intersection of North Capitol Street and New Hampshire Avenue NE.
- Eliminate the westbound Buchanan Street approach and the Hawaii Avenue northbound left-turn movement at the intersection with North Capitol Street.
- Provide an additional southbound through lane at the intersection of North Capitol Street and Harewood Road.
- Replace the Scale Gate Road bridge over North Capitol Street to incorporate two lanes in each direction, as well as full sidewalks. Signalize the diamond interchange ramp intersections with Scale Gate Road.
- Modify the proposed North Capitol Street/Irving Street interchange to provide additional connections between Irving Street, North Capitol Street and the Washington Hospital Center.
- At the intersection of Irving Street NW and First Street NW, provide separate through and left-turn lanes. Restrict eastbound left-turns and move them to the signalized intersection of Irving Street NW and Proposed Driveway 3.
- Provide a connection into the Washington Hospital Center from Park Place.
- Provide an additional southbound left-turn lane and westbound right-turn lane at the intersection of Michigan Avenue NW and First Street NW.

No developer has been selected yet; therefore a final phasing plan is not available. Therefore, a phasing strategy for the proposed mitigation measures was developed based on trip thresholds. The phasing strategy is intended to outline the mitigation measures that would be required when the site meets the threshold of 20 percent, 40 percent, 60 percent, and 80 percent of full build site generated vehicle trips. Table 3-29 identifies which mitigation measure would be applicable to each threshold. A developer may choose to implement the mitigation measures identified in this study, or work with DDOT to identify other potential measures that could be implemented in place of the mitigation options presented in this study.

Table 3-28: Vehicle Mitigation Measure Implementation Strategy

Threshold	Mitigation Measure
20%	Upgrade all study area signalized intersections to be fully actuated and optimize phasing and offsets (DDOT). Modify the proposed North Capitol Street/Irving Street interchange to provide additional connections between Irving St., North Capitol St. and the Washington Hospital Center (DDOT). At the intersection of Irving Street NW and First Street NW, provide separate through and left-turn lanes. Restrict eastbound left-turns and move them to the signalized intersection of Irving Street NW and Proposed Driveway 3 (Developer). Provide a connection into the Washington Hospital Center from Park Place (Developer).
40%	Provide an additional northbound through lane at the intersection of North Capitol Street and New Hampshire Avenue NE (Developer). Eliminate the Hawaii Avenue northbound left-turn movement at the intersection with North Capitol Street (Developer).
60%	Provide an additional southbound through lane at the intersection of North Capitol Street and Harewood Road (Developer). Replace the Scale Gate Road bridge over North Capitol Street to incorporate two lanes in each direction, as well as full sidewalks. Signalize the diamond interchange ramp intersections with Scale Gate Road (Developer). Provide an additional southbound left-turn lane and westbound right-turn lane at the intersection of Michigan Avenue NW and First Street NW (Developer).
80%	Implement traffic adaptive or demand responsive signals on North Capitol Street (DDOT).

The results of the capacity analysis for phase threshold is detailed in the Traffic Technical Report. Table 3-30 and Table 3-31 below show the results of the intersection and merge/diverge/weave capacity analyses for the full build.

Table 3-29: 2045 Master Plan Alternative with Crosstown Study Network and Mitigation LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & New Hampshire Ave	F (102.8)	F (320.2)
North Capitol St & Missouri Ave/Riggs Rd	F (134.4)	F (200.8)
North Capitol St & Rock Creek Church Rd/Buchanan St	E (71.7)	C (26.4)
North Capitol St & Hawaii Ave/Allison St	F (124.8)	F (145.0)
North Capitol St & Harewood Rd NE	A (8.0)	F (80.5)
North Capitol St & Harewood Rd NW	C (21.9)	F (219.5)
SB North Capitol St Ramp & Scale Gate Rd	A (10.0)	A (2.7)
NB North Capitol St Ramp & Scale Gate Rd	B (17.6)	C (31.1)
First St/Site Driveway 2 & Irving St	D (40.4)	F (106.3)
North Capitol St & Michigan Ave	F (129.4)	F (141.6)
Franklin St & Michigan Ave	B (18.1)	B (13.3)
Michigan Ave & Irving St	C (25.3)	B (16.4)
Hobart Pl & Irving St	B (17.6)	B (17.5)
North Capitol St & North Capitol Connector (North)	D (37.4)	F (127.6)
North Capitol St & North Capitol Connector (South)	C (31.6)	C (25.7)

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
Irving St & North Capitol Connector (North/South)	B (15.2)	A (9.7)
Irving St & North Capitol Connector West	A (4.7)	B (12.3)
Park Pl & Kenyon St	C (20.9)	B (15.8)
Park Pl & Irving St	C (28.2)	C (20.6)
Park Pl & Michigan Ave	C (30.6)	D (47.2)
Park Pl & Hobart Pl	C (33.6)	B (15.7)
Hobart Pl & Michigan Ave & Warder St	C (21.6)	B (14.8)
First St & Michigan Ave	C (29.1)	D (53.8)
Irving St & Michigan At Irving PUD Driveway	A (3.8)	A (3.1)
Michigan Ave & PU-DO Out	A (0.3)	A (3.5)
Michigan Ave & Half St	A (4.3)	D (39.6)
Irving St & Site Driveway 1	A (5.0)	A (0.7)
Irving St & Site Driveway 3	C (28.5)	C (27.6)

Table 3-30: 2045 Master Plan Alternative with Crosstown Study Network with Mitigation LOS for Merge/Diverge/Weave Areas

Interchange	Segment			AM Peak		PM Peak	
	Type	From	To	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
North Capitol St & Scale Gate Rd	Diverge	North Capitol Street NB	Scale Gate Road	17.2	B	24.2	C
	Merge	Scale Gate Road	North Capitol Street NB	15.3	B	25.3	C
	Diverge	North Capitol Street SB	Scale Gate Road	21.3	C	12.8	B
	Merge	Scale Gate Road	North Capitol Street SB	18.9	B	14.3	B

3.7.2 Impacts to Transit Services

No Action Alternative

While the background transit trip growth rate would likely accommodate transit trips generated by most of the proposed developments within the area of the AFRH-W site, a substantial amount of additional transit ridership demand will be generated by the proposed McMillan development, located to the south of the AFRH-W site and Washington Hospital Center. This additional transit ridership would not be accounted for in the background growth rate and thus must be included separately in the No Build condition analysis. According to the 2014 Transportation Impact Study, the McMillan site is expected to

generate 1,200 new bus trips during the AM peak hour and 1,337 new bus trips during the PM peak hour. These site-generated transit trips were distributed on the No Build transit network based on information contained in the Transportation Impact Study.

The proposed McMillan site is also anticipated to generate 600 new AM peak hour and 668 PM peak hour Metrorail trips. However, the Transportation Impact Study calls for a site-specific shuttle service to connect the site to the Brookland-CUA Metrorail station. Therefore, the Metrorail trips are not included in the analysis as bus trips.

The background transit growth was combined with the proposed McMillan transit trips to estimate future No Build R/C ratios (see Table 3-32). Despite the additional capacity added to the transit system by the proposed transit enhancements, the additional transit trips generated by the McMillan site would add significant demand to the transit system. Route 80 would exceed the acceptable R/C ratio during the PM peak hour and Route D8 would also exceed the acceptable R/C ratio during both peak hours.

Table 3-31: 2045 Background/No Build Condition Transit Capacity Analysis Results

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)	Capacity (pass/hr)	R/C	Acceptable?
NB/SB	80/80X*	AM	NB	481	451	1.07	YES
			SB	612	574	1.07	YES
		PM	NB	623	492	1.27	NO
			SB	572	451	1.27	NO
	H1	AM	NB	0	0	N/A	N/A
			SB	100	164	0.61	YES
		PM	NB	110	123	0.89	YES
			SB	0	0	N/A	N/A
	D8*	AM	NB	321	246	1.31	NO
			SB	375	287	1.31	NO
		PM	NB	381	205	1.86	NO
			SB	381	205	1.86	NO
	TOTAL	AM	NB	802	697	1.15	YES
			SB	1,087	1,025	1.06	YES
		PM	NB	1,114	820	1.36	NO
			SB	953	656	1.45	NO
EB/WB	H2, H3, H4/ Tenleytown to Brookland	AM	EB	425	410	1.04	YES
			WB	596	574	1.04	YES
		PM	EB	580	533	1.09	YES
			WB	535	492	1.09	YES

Master Plan Alternative

Upon full build-out, the AFRH-W site is anticipated to generate a total of 936 new AM peak hour transit trips and 1,014 PM peak hour transit trips (see Table 3-33). Metrorail trips were divided between the Brookland-CUA station and Columbia Heights station based on their proximity to the AFRH-W site. As such, 70 percent of Metrorail trips were assigned to the Brookland-CUA station. However, since the stations are located outside of an acceptable walking distance, the Metrorail trips were assigned to the east-west bus corridor (H2, H3, H4, and the Tenleytown – Brookland Circulator). Bus trips were distributed to the existing transit corridors based on the regional trip distribution percentages utilized for the vehicular capacity analysis. The resulting transit trip distribution is shown in Table 3-34.

Table 3-32: AFRH-W Full Build-Out Transit Trip Generation

Mode	AM Peak Hou			PM Peak Hour		
	In	Out	Total	In	Out	Total
Bus	187	134	321	139	208	347
Metro	224	220	444	219	266	485
Walk/Bike	115	56	171	61	121	182
Total	525	410	936	419	595	1,014

Table 3-33: AFRH-W Full Build-Out Transit Trip Distribution

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)
NB/SB	80/80X	AM	NB	80
			SB	79
		PM	NB	83
			SB	69
	H1	AM	NB	0
			SB	50
		PM	NB	45
			SB	0
	D8	AM	NB	0
			SB	49
		PM	NB	0
			SB	35
TOTAL	AM	NB	80	
		SB	178	
	PM	NB	128	
		SB	104	

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)
EB/WB	H2, H3, H4/ Tenleytown to Brookland	AM	EB	339
			WB	168
		PM	EB	406
			WB	194

The results of the 2045 Build Condition transit capacity analysis are shown in Table 3-35 and indicate significant capacity deficiencies on the north-south and east-west corridors. Overall, the transit trips generated by the site result in all routes operating above the acceptable R/C ratio, with the exception of Route H1 in the AM peak hour. The most significant capacity deficiencies exist on Routes D8, H2, H3, and H4. While the deficiency on Route D8 is due largely to Background/No Build condition transit ridership, deficiencies on Routes H2, H3, and H4 are due to the large amount of Metrorail passengers generated by the ARFH site.

Table 3-34: 2045 Future Build Condition Transit Capacity Analysis Results

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)	Capacity (pass/hr)	R/C	Acceptable?
NB/SB	80/80X*	AM	NB	561	451	1.24	NO
			SB	691	574	1.20	NO
		PM	NB	706	492	1.44	NO
			SB	641	451	1.42	NO
	H1	AM	NB	0	0	N/A	N/A
			SB	150	164	0.91	YES
		PM	NB	155	123	1.26	NO
			SB	0	0	N/A	N/A
	D8*	AM	NB	321	246	1.30	NO
			SB	424	287	1.48	NO
		PM	NB	381	205	1.86	NO
			SB	416	205	2.03	NO
	TOTAL	AM	NB	882	697	1.27	NO
			SB	1,265	1,025	1.23	NO
		PM	NB	1,242	820	1.51	NO
			SB	1,057	656	1.61	NO
EB/WB	H2, H3, H4/ Tenleytown Circulator	AM	EB	764	410	1.86	NO
			WB	764	574	1.33	NO
		PM	EB	986	533	1.85	NO
			WB	729	492	1.48	NO

*Includes one half of the additional capacity provided by the Brookland to Union Station Circulator.

Mitigation Measures

The results of the 2045 Build Condition transit capacity analysis indicate several needs, including:

- Improving transit connections within one quarter mile of the center of the AFRH-W site.
- Additional capacity on the north-south corridors, particularly during the PM peak hour.
- Enhanced connections between the site and the Columbia Heights and Brookland-CUA Metrorail stations.

In order to address these needs, several mitigation measures were evaluated:

- Establish a combined shuttle service to and from the Columbia Heights and Brookland-CUA Metrorail stations with the nearby hospitals.
- Shift Routes H2, H4, or the proposed Tenleytown to Brookland Circulator from Michigan Avenue to Irving Street.
- Shift Route H1 to Irving Street.
- Utilize articulated buses on Route 80/80X.
- Extending Route D8 into the AFRH-W site.

The above mitigation measures represent significant investments in transit within the area of the AFRH-W site. These investments would result in a significant increase in capacity. Overall north-south and east-west corridor R/C ratios would improve significantly when compared to the No Build condition. All routes would operate within acceptable R/C ratios except Routes 80/80X, D8, and H2, H3, H4 which would experience R/C ratios slightly over acceptable levels (less than 0.1 points). However, the proposed mitigation measures would improve R/C ratios when compared to the No Build condition (Table 3-36).

Table 3-35: 2045 Future Build Condition with Mitigation Transit Capacity Analysis Results

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)	Capacity (pass/hr)	R/C	Acceptable?
NB/SB	80/80X*	AM	NB	539	495	1.09	YES
			SB	691	662	1.04	YES
		PM	NB	706	558	1.27	NO
			SB	623	495	1.26	NO
	H1	AM	NB	22	164	0.13	YES
			SB	150	164	0.91	YES
		PM	NB	155	164	0.95	YES
			SB	29	164	0.18	YES
	D8*	AM	NB	373	328	1.14	YES
			SB	424	328	1.29	NO
		PM	NB	393	328	1.20	YES
			SB	405	328	1.23	NO
	TOTAL	AM	NB	934	987	0.95	YES
			SB	1,265	1,154	1.10	YES
		PM	NB	1,254	1,050	1.19	YES

Primary Direction	Line	Peak Hour	Direction	Ridership (pass/hr)	Capacity (pass/hr)	R/C	Acceptable?
			SB	1,057	987	1.07	YES
EB/WB	Metro Shuttles	AM	EB	369	410	0.90	YES
			WB	212	410	0.52	YES
		PM	EB	423	410	1.03	YES
			WB	196	410	0.48	YES
	H2 and Tenleytown Circulator**	AM	EB	187	369	0.51	YES
			WB	176	328	0.54	YES
		PM	EB	229	328	0.70	YES
			WB	211	328	0.64	YES
	Combined H3, H4, H2, and Circulator	AM	EB	453	451	1.00	YES
			WB	631	615	1.03	YES
		PM	EB	647	574	1.13	NO
			WB	584	533	1.10	NO
	TOTAL	AM	EB	822	861	0.95	YES
			WB	843	1,025	0.82	YES
		PM	EB	1,070	984	1.09	YES
			WB	780	943	0.83	YES

*Includes one half of the additional capacity provided by the Brookland to Union Station Circulator.

**Realigned to Irving Street.

3.7.3 Impacts to Pedestrians and Bicycle Facilities

No Action Alternative

Under the No Action Alternative, there would be no impact to existing or proposed pedestrian and bicycle facilities.

Master Plan Alternative

The AFRH-W site would not have a negative impact on existing or proposed pedestrian and bicycle facilities. In fact, many of the recommendations presented in City plans would be necessary to ensure adequate connections between the AFRH-W site, nearby transit options, and surrounding community. These enhancements would be needed particularly in the area of Irving Street NW where the site is anticipated to generate the most additional pedestrian and bicycle trips.

Mitigation Measures

In order to facilitate safe and efficient pedestrian and bicycle circulation within and outside of the AFRH-W site, several recommendations are provided below. It should be noted that all recommendations should follow the guidance presented in the master plans.

In order to facilitate safe and efficient pedestrian and bicycle circulation within and outside of the AFRH-W site, several mitigation options are provided below. It should be noted that all options should follow the guidance presented in the master plans.

Internal - Internal pedestrian and bicycle circulation is critical to promoting pedestrian and bicycle use outside of the site, as well as minimizing internal vehicle trips. The following mitigation options should be incorporated within the AFRH-W site:

- Provide marked crosswalks across all approaches at all internal intersections.
- Provide sidewalks on both sides of all internal roadways with a minimum width of 16 feet along building frontages, and 11 feet along areas of open space.
- Provide dedicated bike lanes or paths on primary roadways within the site, as well as roadways which connect to the external transportation network. Shared bike lanes should be used on minor roadways. The AFRH-W Master Plan (Appendix F, Pages 27-29) categorize each street within the proposed development in terms of load
- Incorporate Capital Bikeshare stations within the site along internal roadways as well as within parking facilities. The developer should work with DDOT and Capital Bikeshare personnel to determine how many Bikeshare stations are needed and the ideal locations the stations.
- Provide bicycle parking for every building as well as shower facilities for office buildings.

External - Facilities external to the site are also needed to mitigate the barriers to pedestrian and bicycle travel within the study area, as well as to connect the site with nearby land uses and transit. Potential external pedestrian and bicycle facilities are depicted in Figure 3-6 and are described below.

- Community Connectivity - The AFRH-W campus, including North Capitol Street, presents a significant barrier to east-west and north-south connectivity. The AFRH-W site is a closed/secure site which ultimately makes providing additional connectivity difficult. A broader discussion with AFRH would be required to provide connectivity across the AFRH-W campus. However, as part of the Zone A redevelopment the following additional east-west and north-south connections are recommended:
 - Construct a 10-foot wide multi-use path along the north side of Irving Street/Kenyon Street between Park Place and Michigan Avenue NE. Where the path crosses the North Capitol Street ramp, provide high-visibility crosswalks, signing, and lighting. Consider installing yield pavement markings across exit ramps and stop-controlled entrance ramps for the proposed path, as well as the existing path on the south side of Irving Street.
 - Construct a 10-foot wide multi-use path on the west side of North Capitol Street between Irving Street and Harewood Road. The path would connect to the proposed path on Irving Street, as well as Scale Gate Road, and provide a new north-south connection.
 - Provide dedicated bike lanes and sidewalks on both sides of Scale Gate Road between the AFRH-W site and Harewood Road.
 - Provide crosswalks across the west leg of the intersection of First Street NW and Irving Street NW, and across the east leg of the intersection Pershing Drive and Irving Street NW. Provide a minimum 16-foot wide pedestrian refuge median for both crosswalks.

Not only would these facilities improve overall pedestrian and bicycle circulation within the area of the site, they would provide the necessary connections between the site and nearby

employment/activity centers, including the Washington Hospital Center, CUA, Trinity University, and the Arts Walk.

- **Transit Connectivity** - Some transit services, such as Metrobus Route 80 and Metrorail, would remain off-site. Thus, pedestrian and bicycle facilities are needed to connect the site to those transit services to provide options for those who want to walk or bike as a “last mile” connection. The proposed multi-use path on Irving Street and sidewalk and bike lanes on Scale Gate Road would provide the needed connections between the AFRH-W site and transit services. The multi-use path on Irving Street would tie into pedestrian and bicycle facilities on Michigan Avenue NE and Kenyon Road/Irving Street NW which ultimately would connect to the Brookland-CUA and Columbia Heights Metro stations and other bus routes. The proposed bike lanes and sidewalks on Scale Gate Road would connect the northern end of the site to the Brookland-CUA Metro station and supplemental bus routes via existing facilities within and around the CUA campus.

In addition to the linear facilities, the developer should work with Capital Bikeshare to provide both onsite and offsite bikeshare stations. Bikeshare station coverage within the area of the AFRH-W site is relatively light. The closest bikeshare station is located on the Washington Hospital Center campus. Bikeshare should be considered a valuable “last mile” connecting mode, particularly between the site and the Brookland-CUA and Columbia Heights Metro station. However, additional facilities will be needed in order to provide the necessary coverage and capacity to make it a reliable travel option.

Bikeshare stations are provided within one block of both Metro stations. However, based on the Capital Bikeshare website, these locations are typically heavily utilized indicating that additional capacity is needed. Furthermore, the facility located on the Washington Hospital Center campus is also well-utilized. The ultimate AFRH-W developer should work with Capital Bikeshare to provide additional capacity near the AFRH-W site as well as at activity centers and Metro stations. Consideration should be given to providing a bikeshare station along Irving Street that could be utilized by both residents and employees of the AFRH-W site, as well as employees and visitors of the Washington Hospital Center.

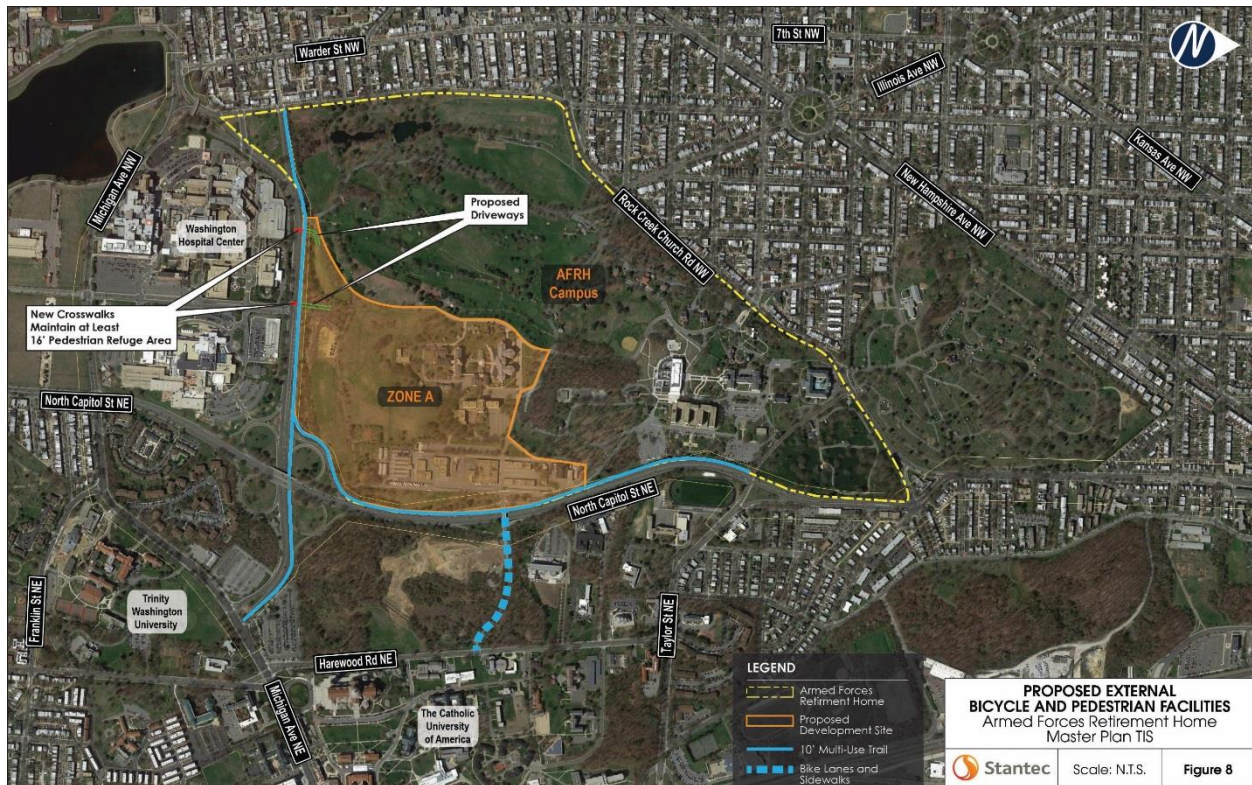


Figure 3-6. Proposed External Bicycle and Pedestrian Facilities

3.8 Environmental Contamination

In advance of the 2008 EIS, A Phase I Environmental Site Assessment (ESA) was conducted for AFRH-W in July 2004 (G&O 2004), and a Phase II ESA was completed in April 2006 (MACTEC 2007). The Phase I ESA identified several recognized environmental conditions (RECs) associated with on-site facilities and waste management practices, which were further investigated in the Phase II study. Since the 2007 Final EIS, AFRH-W has performed several remediation actions in order to remove hazardous materials and underground storage tanks (USTs) within Zone A. Remediation actions are summarized below in Table 3-37.

Table 3-36: Remediation Efforts since 2006 Phase II ESA

Building/Location	UST/Contaminant type	Action Taken
64	1,000 Gallon Diesel UST	Removed December 9, 2008.
69	Ash Waste material determined to be hazardous waste.	Reportedly removed. Not observed during 2015 ESA.
75	8,000 Gallon Diesel UST and 3 associated fuel dispensers.	Removed December 17, 2008.

An updated Phase I ESA was performed in January and February 2015 in order to assess current conditions within Zone A. No studies or surveys were undertaken to assess for the presence, location or quantity of asbestos-containing materials (ACMs), lead-based paint (LBP), polychlorinated biphenyls (PCBs) or mercury. Due to the age of onsite structures it is possible that these materials are present at AFRH-W.

The following observations were made during the assessment:

- The Phase II ESA by MACTEC identified that soil is impacted with elevated concentrations of naphthalene in the vicinity of Building 46. The level of naphthalene reported did not exceed Risk Based Concentrations (RBCs) or DC Risk Based Screening Levels (RBSLs). In addition, a groundwater sample from an existing monitoring well down gradient of Building 46 was found to be impacted by chlorinated solvents including perchloroethylene (PCE) and its daughter product trichloroethylene (TCE) at concentrations exceeding their respective tap water RBCs and EPA Maximum Contaminant Levels (MCLs). The elevated naphthalene concentrations in soil and the chlorinated solvents in groundwater were attributed to a past release or spill of dry cleaning solvents from Building 46, although no “source area” was identified. There is also potential for soil vapor impacts associated with these releases. The determination of soil and groundwater impacted by dry cleaning solvents represents a REC.
- EPA file information related to a No Further Remediate Action Planned (NFRAP) listing for the AFRH-W was reviewed for the Phase II ESA by MACTEC. Based on the documents reviewed, it was determined that several thousand World War II surplus paint cans were buried in a storage cell a few feet deep in an area northwest of Building 72. In 1990 these paint cans and 1,000 tons of xylenes-contaminated soil were removed. Groundwater analysis did not show any levels of xylenes and the case was closed by EPA. This finding is considered a Historical Recognized Environmental Contaminant (HREC) as the remediation was addressed to the satisfaction of EPA without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).
- As reported in the Phase II ESA by MACTEC, elevated concentrations of petroleum hydrocarbons - diesel range organics (TPH-DRO) were detected in soil borings at Building 76. The TPH-DRO concentrations exceeded the DC release reporting level and DC Tier 1 RBSL. The soil borings were adjacent to hydraulic lifts, and the TPH-DRO levels apparently represent hydraulic oil releases from hydraulic lifts and/or hydraulic lines. There is also potential for soil vapor and groundwater impacts from these releases. The determination of soil impacted with elevated TPH-DRO concentrations above DC release reporting and cleanup criteria is a REC.
- A 550-gallon UST was removed from the area near Building 52 in June of 2009. File information related to the former UST system at the Barnes Building includes a Notice of Inspection and Site Directive form (Tank Removal and Assessment), completed by DOEE Branch inspector Sylvester Mode. The form documents that a 550-gallon diesel UST was removed on June 29, 2009. A closure letter was never received by DOEE for the UST and therefore it was not “properly closed.” A search of building department records for the subject property, including permits issued by the DC Department of Consumer and Regulatory Affairs, does not identify a listing for an Alteration and Repair permit for closure of this UST.
- As reported in previous ESAs a 500-gallon diesel UST was removed from the exterior of Building 74/74A. In a letter dated December 9, 1998 from the AFRH (Kurt J. Kuhn, Safety and Occupational Health Manager) to the UST Branch of DC Environmental Regulation Administration regarding three tank closures at the AFRH-W was reviewed. One of the USTs referenced is a 1,000-gallon emergency generator tank at the Cold Storage Warehouse (Building 74/74A). The letter states that the UST was closed and removed in mid-November of 1998 and

designated to be replaced with an aboveground storage tank (AST). Therefore, since the letter and notification closure form were written after the tank was removed (i.e., visually inspected), it is reasonable to assume the 500-gallon diesel UST was actually 1,000-gallons. A search of building department records for the subject property, including permits issued by the DC Department of Consumer and Regulatory Affairs, does not identify a listing an Alteration and Repair permit for closure of this UST.

- A 1,500-gallon diesel UST is present near the loading dock for Building 56. Building 56 was reportedly vacated in 2013 and the contents of the tank were pumped out pending possible future re-occupancy.
- As reported in the previous ESAs vent pipes and fill caps were identified for two inactive USTs near the southwest corner of Building 46.
- Containers of liquid and solid wastes, including hazardous wastes and unidentified wastes, were identified in many interior locations within the Service Area. These include but are not limited to corrosive boiler and water treatment chemical containers in Building 46 and flammable liquid containers (fuels, lubricants and hydraulic oil) in Building 38. None of the containers appeared to be leaking or represent a material threat of release to the environment. This finding is not considered to be a REC, HREC or *de minimis* condition.
- Several 55-gallon drums of unidentified waste are located along the west exterior wall of Building 73. The drums are labeled “pending laboratory analysis.” The drums are significantly weathered and at least one of the drums is rusted through and leaking contents (apparently soil material) to the asphalt pavement. This finding represents a REC (Stantec 2015).

3.8.1 Impacts to Environmental Contamination

No Action Alternative

Under the No Action Alternative, the action proposed in this SEIS would not be taken. AFRH-W would remain under Federal ownership and no new construction would occur. Opportunities to raise revenue would be limited to the reuse of existing buildings. An O&M program and other precautions should be implemented for the management of ACMs, LBP, PCBs, and other potentially hazardous materials in the vacant buildings. Abatement of these materials within the vacant buildings on-site would be conducted as necessary. Therefore, no direct, indirect or cumulative impacts would occur.

Master Plan Alternative

Several hazardous materials/hazardous waste issues were identified and assessed during the most recent Phase I ESA. Environmental contamination issues would need to be resolved prior to implementation of any of the Master Plan Alternative as described in Mitigation Measures below. The removal of hazardous waste and contaminants in the buildings and on the site would have a direct, long-term, minor, beneficial impact.

Mitigation Measures

The following actions were recommended in accordance with the Phase I ESA, and would be undertaken by AFRH:

Additional assessment is recommended in the vicinity of Building 46 to delineate the lateral and vertical extend of naphthalene, PCE, TCE and related dry cleaning solvents and to establish the actual source area. An active or passive soil gas survey should be performed as the initial investigative task for this assessment, prior to additional soil and ground-water sampling. Wipe samples should be collected on the concrete floor in the Building 77 Pesticides Storage Room to confirm the presence/absence of pesticides and herbicides, if future occupancy or demolition is proposed. The release of TPH-DRO at Building 76 should be reported to the DOEE UST Division. Additional subsurface soil sampling is recommended in the area of the hydraulic lifts at Building 76 to delineate the lateral and vertical extent of petroleum impact. No additional groundwater sampling is recommended although the DOEE UST Division may require additional groundwater data. Remediation of soils with TPH-DRO greater than 960 mg/kg will likely be required by the DOEE.

The contents of all waste drums near Building 73 should be identified and characterized for proper disposal. If hazardous waste is present, some of the drums will require over packing due to their deteriorated condition.

The presence of the inactive USTs at Building 46 should be reported to the DOEE UST Division. Inactive USTs must be properly closed, including an assessment for leaks and evidence of past releases. The DOEE UST may allow for closure in place due to utility and related infrastructure constraints.

The removal of both USTs near Buildings 52 and 74 should be verified by excavation, geophysical methods and/or further records review. After verification of UST removal, conduct a limited contamination assessment in the areas of the former USTs to include collection of soil and groundwater samples for analysis of TPH-DRO.

Application for temporary closure of the UST near Building 56 must be made to the DOEE UST Division. Additional criteria must be met for closure including capping the lines and securing the fill ports.

All hazardous materials including ACMs and LBP must be properly assessed and remediated prior to demolition of buildings or building renovations (Stantec 2015).

3.9 Unavoidable Adverse Impacts

Unavoidable adverse impacts of the proposed action would include, short-term temporary impacts, such as noise, air emissions, and occasional traffic congestion associated with construction activities.

Unavoidable, long-term adverse effects would include construction of new buildings within open space/meadows on AFRH-W; removal of mature trees; changes in viewsheds for residential areas outside of AFRH-W; permanent changes in the historic cultural landscape; changes in viewsheds to National Register listed and National Register eligible properties; and an increase in traffic and associated noise on local roads. In all cases, mitigation measures could be developed to minimize these impacts, and impacts would be addressed in compliance with state, local, and Federal regulations.

3.10 Existing Relationships between Local Short-term Uses of the Proposed Action and Maintenance and Enhancement of Long-Term Productivity

The long-term benefits of the proposed action would occur at the expense of short-term impacts in the vicinity of the project site. These short-term effects would occur during the period of construction, and would include localized noise and air pollution, as well as potential increased sedimentation and erosion. However, these impacts are temporary and proper controls would be utilized to prevent these impacts from having a lasting effect on the environment.

Short-term gains to the local economy would occur as local companies and workers are hired and local businesses provide services and supplies during the construction of new buildings and required infrastructure. However, upon completion of the project, the gains to local economy will evolve into a long-term benefit as new businesses, employees, and residents utilize the new space and provide consistent business to the surrounding merchants.

Furthermore, the proposed action will provide a long-term revenue source to the AFRH Trust Fund that will sustain AFRH-W.

3.11 Irreversible or Irretrievable Commitment of Resources

The proposed action would require the commitment of land for construction of new buildings within AFRH-W. The total commitment would include the loss of open space/meadows; removal of mature trees; and the permanent changes to the historic cultural landscape currently present on the site. The loss of these resources would be permanent.

A commitment of fuel and energy would be required to construct new buildings. Other resource commitments during the construction period would include construction materials and labor. There would be an additional long-term commitment of labor for the maintenance of buildings and infrastructure. In addition, once new buildings are in place, there is a commitment of utilities, fuel, and power. All of these resources relating to the construction and maintenance of the facility and its infrastructure should be considered irretrievably committed.

While there will be the above commitment of resources, through conservation practices some of these resources, such as water supply, may be retrieved.

3.12 Summary of Proposed Mitigation Measures under the Preferred Alternative (Master Plan Alternative)

Stormwater Management

- Low-impact development techniques would be implemented, such as bioretention areas, street trees, green roofs on new buildings, rain barrels or cisterns, and pervious sidewalk materials.
- Concentrating large-scale development into Zone A of the AFRH-W campus will preserve and protect 174 acres of existing open space in the AFRH Zone, including the golf course, building quadrangles, woodlands, forests, and other open areas.

- The Master Plan has minimized the amount of additional impervious surface by incorporating parking into proposed buildings, replacing excess surface parking lots with open space, prohibiting new surface parking lots, and limiting above-grade parking facilities to only four parcels.
- The vegetative buffer along the perimeter wall of the campus in both zones will be preserved and enhanced with additional plantings, which will reduce stormwater runoff in these areas. Impacted trees or tree stands will be replaced in form and function to the maximum extent practicable.
- A Stormwater Management Plan (SWMP) and a Soil Erosion and Sediment Control Plan will be prepared in accordance with the amended 21 DCMR 5 and the 2013 SWMG. All construction activities including clearing, grading, site stabilization, the preservation or creation of pervious land cover, the construction of drainage conveyance systems, the construction of BMPs, and all other stormwater and sediment related components of the project will be conducted in strict accordance with the SWMP.

Greenhouse Gases and Climate Change

- Implementation of an idling reduction program to reduce emissions associated with unnecessary vehicle idling;
- Implementation of preventative maintenance schedules for construction equipment, to improve the operational efficiency and reduce GHG emissions;
- Energy conservation measures and/or renewable energy sources could be incorporated into building design to mitigate impacts related to emissions from energy use; and
- Incorporate climate adaptation techniques/systems into the new development. Improved building design, operations, increased green space (such as rooftop gardens or landscaping), and water management can reduce energy use in buildings and can protect them from severe precipitation, flooding and increases in temperature (CCAP 2014).

Land Use Planning and Zoning

No mitigation required.

Transportation

Traffic Mitigation

- Upgrade all the study area signalized intersections to be fully actuated and optimize phasing and offsets.
- Implement traffic adaptive or demand responsive signals on North Capitol Street.
- Provide an additional northbound through lane at the intersection of North Capitol Street and New Hampshire Avenue NE.
- Eliminate the westbound Buchanan Street approach and the Hawaii Avenue northbound left-turn movement at the intersection with North Capitol Street.

- Provide an additional southbound through lane at the intersection of North Capitol Street and Harewood Road.
- Replace the Scale Gate Road bridge over North Capitol Street to incorporate two lanes in each direction, as well as full sidewalks. Signalize the diamond interchange ramp intersections with Scale Gate Road.
- Modify the proposed North Capitol Street/Irving Street interchange to eliminate the free ramp movements on Irving Street to provide safer and more controlled pedestrian/ bicycle crossing. It should be noted that, at a minimum, the improvements to the northwest quadrant of the interchange will be required.
- At the intersection of Irving Street NW and First Street NW, provide an additional westbound left-turn lane, two northbound left-turn lanes, and an eastbound right-turn lane; OR, divert vehicles from the intersection of First Street NW and Irving Street NW by providing a secondary entrance to the Washington Hospital Center Campus from the North Capitol Street/Irving Street interchange.
- Provide a double left-turn lane at the intersection of Irving Street NW and Driveway 3. All traffic entering the site from eastbound Irving Street NW must do so at this intersection.
- Signalize the intersections of Park Place NW and Hobart Place NW, Hobart Place NW and the Ramp to Michigan Avenue, and Michigan Avenue NW and the Ramp from Hobart Place/Park Place NW. Widen the Ramp to Michigan Avenue NW.
- Provide an additional southbound left-turn lane and westbound right-turn lane at the intersection of Michigan Avenue NW and First Street NW

Transit Mitigation

- Establish a combined shuttle service to and from the Columbia Heights and Brookland-CUA Metrorail stations with the nearby hospitals.
- Shift Routes H2, H4, or the proposed Tenleytown to Brookland Circulator from Michigan Avenue to Irving Street.
- Shift Route H1 to Irving Street.
- Utilize articulated buses on Route 80/80X.
- Extending Route D8 into the AFRH-W site.

Pedestrian Facilities

- Internal Improvements:
 - Provide marked crosswalks across all approaches at all internal intersections.
 - Provide sidewalks on both sides of all internal roadways with a minimum width of 16 feet along building frontages, and 11 feet along areas of open space.
 - Provide dedicated bike lanes or paths on primary roadways within the site, as well as roadways which connect to the external transportation network. Shared bike lanes

- should be used on minor roadways. The AFRH Master Plan (Appendix F, Pages 27-29) categorize each street within the proposed development in terms of load
- Incorporate Capital Bikeshare stations within the site along internal roadways as well as within parking facilities. The developer should work with DDOT and Capital Bikeshare personnel to determine how many Bikeshare stations are needed and the ideal locations the stations.
 - Provide bicycle parking for every building as well as shower facilities for office buildings.
- External Improvements
 - Construct a 10-foot wide multi-use path along the north side of Irving Street/Kenyon Street between Park Place and Michigan Avenue NE. Where the path crosses the North Capitol Street ramp, provide high-visibility crosswalks, signing, and lighting. Consider installing yield pavement markings across exit ramps and stop-controlled entrance ramps for the proposed path, as well as the existing path on the south side of Irving Street.
 - Construct a 10-foot wide multi-use path on the west side of North Capitol Street between Irving Street and Harewood Road. The path would connect to the proposed path on Irving Street, as well as Scale Gate Road, and provide a new north-south connection.
 - Provide dedicated bike lanes and sidewalks on both sides of Scale Gate Road between the AFRH-W site and Harewood Road.
 - Provide crosswalks across the west leg of the intersection of First Street NW and Irving Street NW, and across the east leg of the intersection Pershing Drive and Irving Street NW. Provide a minimum 16-foot wide pedestrian refuge median for both crosswalks.
 - The ultimate AFRH-W developer should work with Capital Bikeshare to provide additional capacity near the AFRH-W site as well as at activity centers and Metro stations.

Environmental Contamination

- Additional assessment is recommended in the vicinity of Building 46 to delineate the lateral and vertical extent of naphthalene, PCE, TCE and related dry cleaning solvents and to establish the actual source area. An active or passive soil gas survey should be performed as the initial investigative task for this assessment, prior to additional soil and ground-water sampling. Wipe samples should be collected on the concrete floor in the Building 77 Pesticides Storage Room to confirm the presence/absence of pesticides and herbicides, if future occupancy or demolition is proposed. The release of TPH-DRO at Building 76 should be reported to the DOEE UST Division. Additional subsurface soil sampling is recommended in the area of the hydraulic lifts at Building 76 to delineate the lateral and vertical extent of petroleum impact. No additional groundwater sampling is recommended although the DOEE UST Division may require additional groundwater data. Remediation of soils with TPH-DRO greater than 960 mg/kg will likely be required by the DOEE.

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Index

Affected Environment.....	2-5, 2-11, 3-1	Lincoln	2-4
AFRH-W.....	2-3, 2-4, 2-5, 3-3, 3-10, 3-14, 3-15, 3-48, 3-72	MARC.....	3-47
Air Quality	2-12	Master Plan	iii, iv, 2-1, 2-3, 2-11, 2-1, 3-1, 3-3, 3-14
Anderson Cottage	2-4	National Capital Planning Commission.....	2-9
Archaeological Resources	2-9	National Environmental Policy Act	2-9, 2-10
Armed Forces Retirement Home .	iii, iv, v, 2-1, 2-3, 2-4, 2-5, 2-11, 2-1, 2-2, 2-3, 2-4, 2-6, 2-8, 3-3, 3-7, 3-8, 3-9, 3-10, 3-11, 3-12, 3-13, 3-14, 3-15, , , 3-48, 3-72	National Historic Preservation Act	2-9
Catholic University	3-10, 3-29	Need for the Proposed Action.....	2-11, 2-1
Clean Air Act	2-9	No-Action Alternative.....	3-48
Clean Water Act.....	2-9	Noise	3-4
Communication	3-15	Parking	iv, 2-1
District of Columbia ..	iii, 2-1, 2-5, 2-10, 3-2, 3-4, 3-10, 3-11, 3-12, 3-14, ,	Regulations.....	2-9, 2-11
Economy	3-10	Section 106.....	2-9
Endangered Species.....	2-9	Soils	v,
Energy	3-14	Stormwater	v, 3-3, 3-4,
Environmental Consequences	2-10, 2-11	The Trust Fund	iii, 2-2
Environmental Justice.....	2-10	Traffic	3-13, 3-48, 3-53
Erosion.....	3-2,	Transportation	3-10, 3-47
Golf Course	2-5, 2-3, 3-3,	Trust Fund	iii, iv, 2-1, 2-2, 2-3, 2-1, 2-3, 3-11
Groundwater	3-3	Utilities	3-10
historic resources.....	3-1	Veterans	2-4, 2-5, 3-29
Historic Resources	2-1	Washington Hospital Center	2-5, 3-29
Housing.....	3-29	
Land Use	2-1, 2-3, , 3-32	Water Resources	3-3
		Wetlands	2-10, 3-3
		Zoning.....	3-31

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Appendix A Transportation Analysis

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