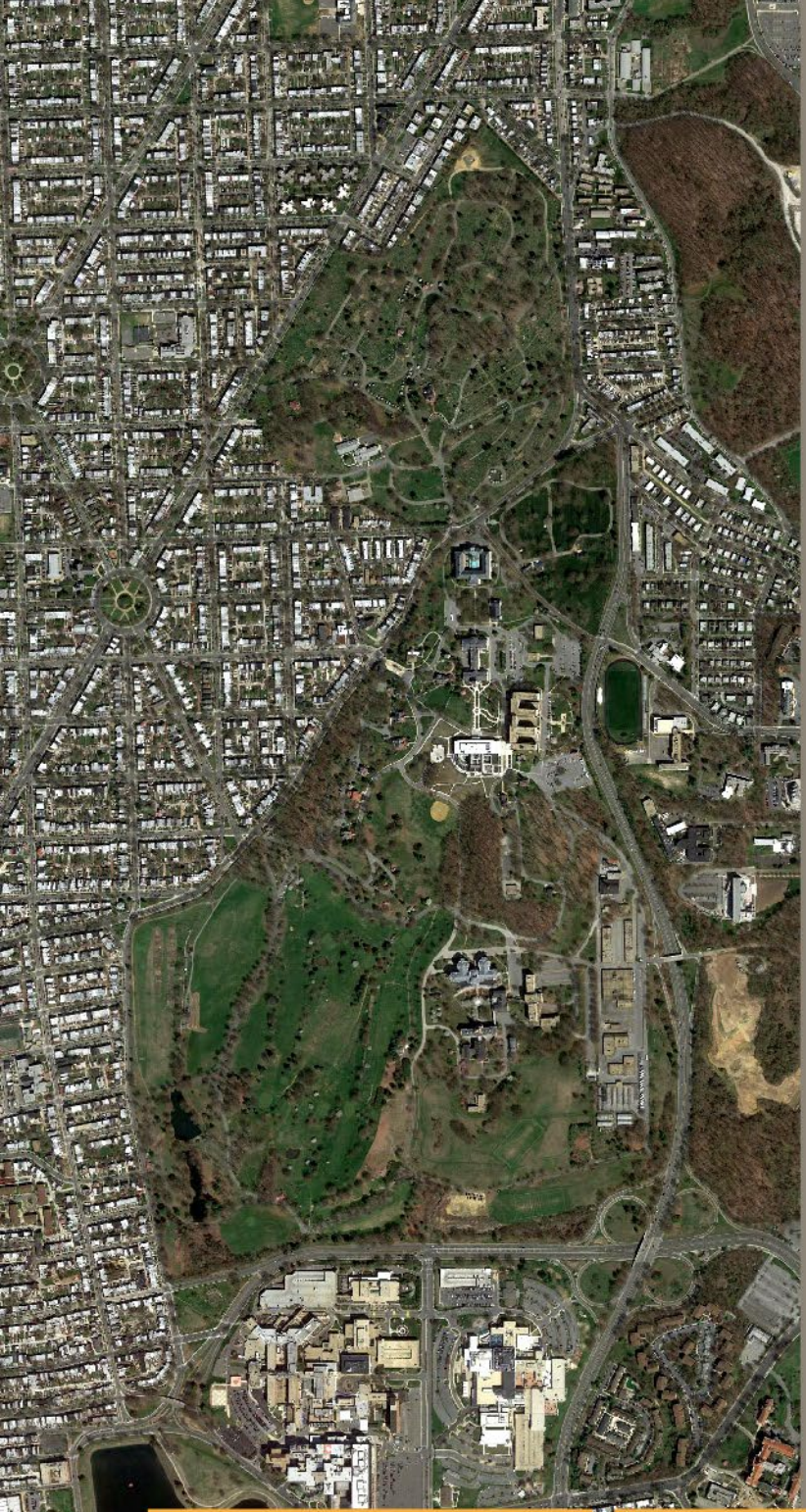

Armed Forces Retirement Home Master Plan Amendment 2

Final Supplemental Environmental Impact Statement

March 2022

Prepared by:

Armed Forces Retirement Home
3700 North Capitol Street, NW
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In cooperation with the:

National Capital Planning Commission
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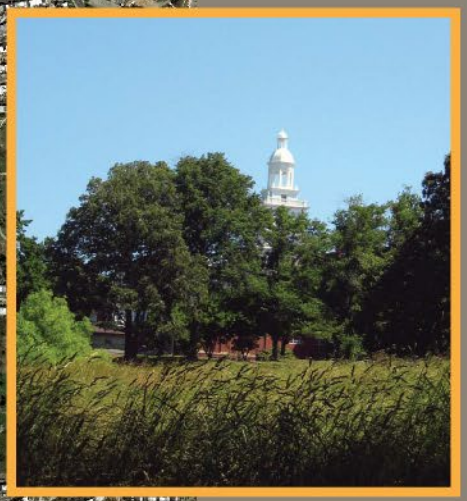

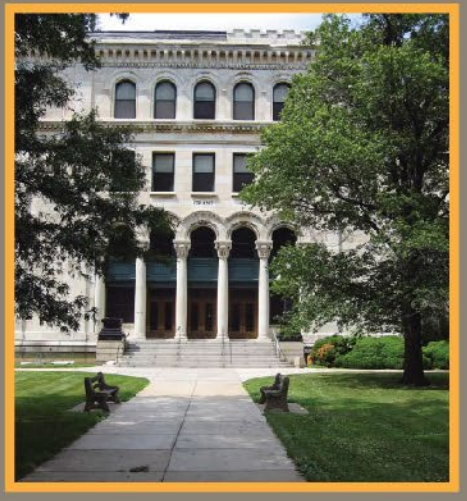

Final Supplemental Environmental Impact Statement

Responsible Agency:

Armed Forces Retirement Home
3700 North Capitol Street, NW
Washington, DC 20011-8400

Armed Forces Retirement Home
Master Plan Amendment 2

The Armed Forces Retirement Home (AFRH) has prepared a Final Supplemental Environmental Impact Statement (SEIS) to analyze the potential impacts from updating the AFRH Master Plan Amendment 2 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 two Master Plan Amendment Alternatives.

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

Armed Forces Retirement Home
Attention: Justin Steffens
3700 North Capitol Street, NW
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Executive Summary

The Armed Forces Retirement Home (AFRH) has prepared a Final Supplemental Environmental Impact Statement (SEIS) to analyze the potential impacts from amending the Master Plan for its campus located at 3700 North Capitol Street, NW, in Washington, DC (AFRH-W). A Final EIS that 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 (ROD) 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, as it was originally envisioned, will have added approximately 6,459,369 gross square feet (gsf) of development to the existing 350,000 gsf on the campus for a total of 6,835,848 gsf of development. However, the selected developer for the project and AFRH were unable to reach an agreement for the project to proceed.

In 2017, AFRH prepared a Draft SEIS for an amendment to the AFRH-W Master Plan which changed the boundaries of the development zones to shift a three-acre Heating Plant parcel from the AFRH Zone to Zone A. The Draft SEIS updated the analysis of impacts due to several on-site factors that have changed since the 2007 EIS, and because the original Final EIS was completed prior to Executive Order (EO) 13653 and EO 13693. As such, supplemental information is required to analyze the impacts of these changes, particularly impacts to traffic, impacts of energy usage and alternative energy sources for the expansion of the Federal facility, and impacts of agency actions on climate change. Since the Draft SEIS was made public in 2017, AFRH released a request for proposals (RFP) to solicit proposals and select a new developer to move forward with the mixed-use development in Zone A. In 2019, AFRH selected a new developer whose Zone A proposal forms the basis of Alternative 3: Master Plan Amendment 2 which is evaluated in this Final SEIS.

This Final 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 amend the Master Plan for the Armed Forces Retirement Home (AFRH) Washington, DC, Campus (AFRH-W), as approved in 2008 and amended for the first time in 2018 to include the adaptive reuse of the Heating Plant into Zone A, to sustain AFRH and its primary funding source, the AFRH Trust Fund.

In 1991, Congress merged the United States Soldiers' and Airmen's Home (USSAH), financed via a Trust Fund established in 1851 with funds provided by Congress after the Mexican-American War, and the United States Naval Home, historically funded by Navy appropriations, into a new and independent executive branch agency (i.e., AFRH). In merging them, Congress stipulated that the USSAH's Trust Fund will become the single, primary, and self-sustaining funding source for both Homes *and* a new

headquarters organization. It also changed the operating model, directing the new AFRH to provide healthcare, services, and accommodations much as the private sector offers at continuing care retirement communities (CCRC), rather than serve as a transient asylum for indigent retired enlisted personnel. As a result, today's AFRH is the federal government's *only* accredited and certified CCRC offering a continuum of five levels of care to eligible residents: independent living, independent living plus, assisted living, long term care, and memory support. This merger, without fundamentally changing the financing model in law, placed significant burden on the now-AFRH Trust Fund: to this day, AFRH is financially constrained in performing its broad, valued, and unique mission.

In accordance with Title 24, chapter 10, the AFRH Trust Fund is capitalized through resident fees; military fines and forfeitures; fifty-cent monthly deductions from active duty enlisted military personnel pay (or an equivalent fee upon admission for eligible reserve component personnel); interest on the Trust Fund; and investments in U.S. Treasury bills. Fees are fixed as a percentage (currently 47%) of the resident's total monthly income and monthly receipts. Additionally, the fees are subject to a limitation on maximum monthly amounts that are based on cost by level of care but that are still below actual cost. Less than 30% of residents actually pay the maximum amount because of these caps and all residents are subsidized to some extent. Fines and forfeitures, formerly the largest fund source at $40M-$50M annually, have decreased by half since 2009 (for various reasons).

These long-standing income sources have proven insufficient to fund operations and improvements. As contributions to the Trust Fund have fallen over the last 14 years, operations and maintenance (O&M) and capital requirements, in comparison, have risen sharply due to the rising costs of healthcare, inflation, and deferred maintenance. Even its investments have been affected, as interest rates have considerably declined due to economic conditions (most recently surrounding the Coronavirus pandemic).

In FY 2009, AFRH total revenue receipts equaled $62.4M. By FY 2016, AFRH total revenue receipts had decreased to $47.5M, a 24% reduction since 2009.

To ameliorate its financial situation, AFRH has implemented several management initiatives: reduced its federal workforce by two-thirds; mothballed or leased vacant or underutilized buildings; consolidated operations; aligned its campuses under a single business model to increase efficiency; outsourced administrative roles and responsibilities to federal shared service providers; and secured performance-based contracts for transportation, trash removal, custodial services, facility maintenance, grounds maintenance, security, and dining services. While these initiatives have helped, they alone cannot cover the current gap between mandatory expenses and AFRH's current revenue streams.

Over the years, Congress has recognized AFRH's (and USSAH's) revenue challenges. In 1976, it authorized the USSAH to begin collecting resident fees to be placed in the Trust Fund to address O&M funding shortfalls. Seeing that fines and forfeitures were not returning to pre-2009 levels, Congress began in 2016 to appropriate $20M-$25M annually from the General Fund to fill the funding gap and support operations. It also directed AFRH and the Department of Defense, which has administrative oversight of the Home, to improve the Trust Fund's solvency by identifying new revenue sources, soliciting donations, and maximizing existing revenue sources. After providing a special appropriation of

$80 million enabling AFRH to construct its new Scott Building, which opened in 2014, Congress appropriated only $1 million annually for capital construction and renovation between FY 2015 and FY 2019. The balance sheet acquisition value of AFRH's property, plant, and equipment was $398 million at the end of FY 2020 (minus $104 million accumulated amortization/depreciation including a $10 million charge in FY 2020). These minimal capital infusions equated to a capital expenditure ratio of only 0.25% and $889 per available unit, as opposed to the nationwide average per unit capital expenditure of $8,465 for private-sector CCRCs. Between FY 2020 and FY2022, Congress began course correcting, appropriating a total $28.3 million from the Trust Fund. This influx helped AFRH begin to address its backlog, although the pandemic critically affected AFRH's ability to execute.

AFRH's outdated and deteriorating facilities have a negative effect on its ability to attract and retain residents, and low occupancy exacerbates AFRH's financial problems by reducing fee income and driving higher fixed costs per resident. AFRH faces more than $50 million in near-term deferred maintenance and required capital improvement projects (at both AFRH-W and AFRH-Gulfport); $80 million in major renovations at AFRH-W to meet the evolving needs of current and future generations of residents, who are living longer, with chronic medical conditions, and who will have special housing and medical needs as they age; and approximately $500 million to execute the strategic building plan as envisioned in the Master Plan.

Therefore, to counter the persisting annual operating losses, generate funds to address its capital crisis, and ensure the financial stability of AFRH for future generations of retired military personnel, AFRH is leveraging its leasing authority under Title 24 United States Code §411 and maximizing the value of its underutilized facilities and acreage on the Washington DC campus. AFRH issued a request for proposal in 2018 to lease 80 acres on the property for a mixed-use development, selected a master developer one year later, and anticipates executing a long-term ground lease in the second quarter of FY 2023. The AFRH-W Master Plan will guide this initiative, which is expected to be a significant new revenue source for AFRH for the next century. This Environmental Impact Statement describes the effects of this new development on the environment.

This new development is AFRH's best opportunity to generate the predictable revenues necessary to continue providing the best housing and comprehensive support services in an independent living retirement community for America's retired enlisted personnel, and to develop future facilities for its changing population.

ES.2 Alternatives

Alternative 1: No Action Alternative

Under the No Action Alternative, the action proposed in this SEIS will not be taken. AFRH-W will remain under federal ownership, with AFRH as the holding agency. No additional new construction will occur on AFRH-W under this alternative. The site will continue to be underdeveloped, with scattered, unused, and mostly non-revenue producing buildings. The facility will 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 will 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 will be created to serve these buildings.

Alternative 2: Master Plan Amendment 1

Alternative 2 is comprised of the development proposed in the 2008 Final AFRH-W Master Plan and includes the adaptive reuse of the Heating Plant as outlined in Amendment 1 to the 2008 Mater Plan. This alternative was studied in the 2007 Final EIS as Alternative 3A, which was selected for implementation in the 2008 ROD. Within the 2008 AFRH-W 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 Amendment 1 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 will take place as AFRH needs new facilities. The AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There will be moderate in-fill development within this zone. Development in Zone A will be undertaken by a private developer to generate income for the AFRH Trust Fund. Zone A is designated for residential, office/research and development, retail, hotel, and medical uses.

Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

Alternative 3: Master Plan Amendment 2 includes development in the AFRH Zone and Zone A, with the Heating Plant Area included in Zone A. However, this alternative also includes the development in Zone A based on the proposal by AFRH Partners, LLC, a joint venture of Madison Marquette and Urban Atlantic, the selected developer, which provides 4.9 million gsf of mixed-use development consisting of residential, hospitality, office, and retail uses to generate income for the AFRH Trust Fund.

ES.3 Impacts

Stormwater Management

Alternative 1: No Action Alternative

No direct, indirect, or cumulative impacts will occur.

Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

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

Greenhouse Gases and Climate Change

Alternative 1: No Action Alternative

No direct, indirect, or cumulative impacts will occur.

Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

- Emissions from construction vehicles will 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 will result in a long-term, minor increase in GHG emissions and contribute negligibly to climate change.
- Indirect adverse impacts will result from an increase in energy use after the proposed development is complete.
- The potential GHG emissions from Alternative 3 will 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.

Air Quality

Alternative 1: No Action Alternative

Existing traffic conditions in the area have resulting moderate, long-term, adverse impacts to air quality. Existing stationary sources result in negligible, long-term, adverse impacts. The No Action Alternative will not add to the impacts and will conform to the *Washington Metropolitan Region SIP*

Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

The conformity analysis demonstrates general conformity with the emission limits set forth under CAA Section 176(C). There will be no exceedances of the CO 1-hour and 8-hour NAAQS for carbon monoxide. There will be minor, long-term, adverse impacts from anticipated stationary sources. Emissions from construction equipment will vary over time, which will result in minor, short-term, adverse impacts.

Land Use Planning and Zoning

Alternative 1: No Action Alternative

No direct, indirect, or cumulative impacts will occur.

Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2 (Preferred 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.

Transportation

Alternative 1: No Action Alternative

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

Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

Implementation of the Master Plan will cause additional growth in the area and will result in major, adverse impacts to traffic in the area.

There will also be major adverse impacts to transit systems as a result of increased ridership.

The existing internal bicycle and pedestrian network and the improvements to the external network will enhance bike and pedestrian access through the site and the region resulting in beneficial impacts.

Environmental Contamination

Alternative 1: No Action Alternative

No direct, indirect, or cumulative impacts will occur.

Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

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

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List of Acronyms

ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Material
ACS	American Community Survey
ADT	Average Daily Traffic
AFRH	Armed Forces Retirement Home
AFRH-W	Armed Forces Retirement Home – Washington
AFRH-WPA	Armed Forces Retirement Home – Washington Programmatic Agreement
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
AVO	Average Vehicle Occupancy
BMPs	Best Management Practices
CBPA	Chesapeake Bay Protection Act of 1988
CCRC	Continuing Care Retirement Communities
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
CZMA	Coastal Zone Management Act of 1972
DC Water	District of Columbia Water and Sewer Authority
DLA	Defense Logistics Agency
DoD	Department of Defense
DOEE	District Department of Energy and Environment
DOT	Department of Transportation
DSP	Development Site Plan
DCSHPO	District of Columbia State Historic Preservation Office
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
FY	Fiscal Year
GHG	greenhouse gas
GSA	General Services Administration
gsf	gross square footage
HCM	Highway Capacity Manual
HPP	Historic Preservation Plan
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
NAA	Non-Attainment Area
NAAQS	National Ambient Air Quality Standards
NCPC	National Capital Planning Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OMB	Office of Management and Budget
O_3	Ozone
Pb	Lead
PDC	Planned Development Commercial
PDH	Planned Development Housing
PEPCO	Potomac Electric Power Company

RBC	Risk Based Concentration
RCP	Reinforced Concrete Pipe
REC	Recognized Environmental Condition
RFP	Request for Proposals
RMA	Resource Management Area
ROD	Record of Decision
RPA	Resource Protection Area
rsf	Rentable Square Feet
SAP	Small Area Plan
SF	Square Feet
SEIS	Supplemental Environmental Impact Statement
SFO	Solicitation for Offers
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
TMP	Transportation Management Plan
URR	Undertaking Review Request
USC	United States Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
USSAH	United States Soldiers' and Airmen's Home
UST	Underground Storage Tank
VA	Veterans Administration
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 AFRH has prepared a Final SEIS to analyze the potential impacts from amending the AFRH-W Master Plan (Master Plan Amendment 2) for its campus located at 3700 North Capitol Street, NW, in Washington, DC (AFRH-W) (see Figure 1). A Final EIS that analyzed potential impacts associated with implementation of the Master Plan for AFRH-W was first issued in November 2007. In 2008, AFRH issued a ROD 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 as it was originally envisioned will have added approximately 6,459,369 gsf of development to the existing 350,000 gsf on the campus for a total of 6,835,848 gsf of development. However, the selected developer for the project and AFRH were unable to reach an agreement for the project to proceed.

In 2017, AFRH prepared a Draft SEIS for amending the AFRH-W Master Plan (Master Plan Amendment 1). The first amendment to the AFRH-W Master Plan changed the boundaries of the development zones to shift the three-acre Heating Plant parcel from the AFRH Zone to Zone A in anticipation of releasing an RFP to solicit proposals and select a new developer to move forward with the mixed-use development. The Draft SEIS analyzed impacts associated with the proposed changes in Master Plan Amendment 1 to comply with NEPA. In addition, the Draft SEIS analyzed impacts resulting from changes that occurred on the AFRH-W campus the previous 2007 FEIS, which included:

- 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.

In addition, the 2007 FEIS was completed prior to EO 13693, *Planning for Federal Sustainability in the Next Decade*; and EO 13653, *Preparing the United States for the Impacts of Climate Change*. Therefore, 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 EOs.

Supplemental information is required to analyze the impacts of these changes, particularly impacts from traffic, climate change, and GHG emissions that may be generated by redevelopment of the AFRH-W.

Since the Draft SEIS was made public in 2017, AFRH released a RFP to solicit proposals and selected a new developer to move forward with the mixed-use development in Zone. A new developer has been selected, AFRH Partners, LLC, a joint venture of Madison Marquette and Urban Atlantic, whose proposal

for the redevelopment of Zone A forms the basis of the Master Plan Amendment 2, which is evaluated as Alternative 3 in this Final SEIS.

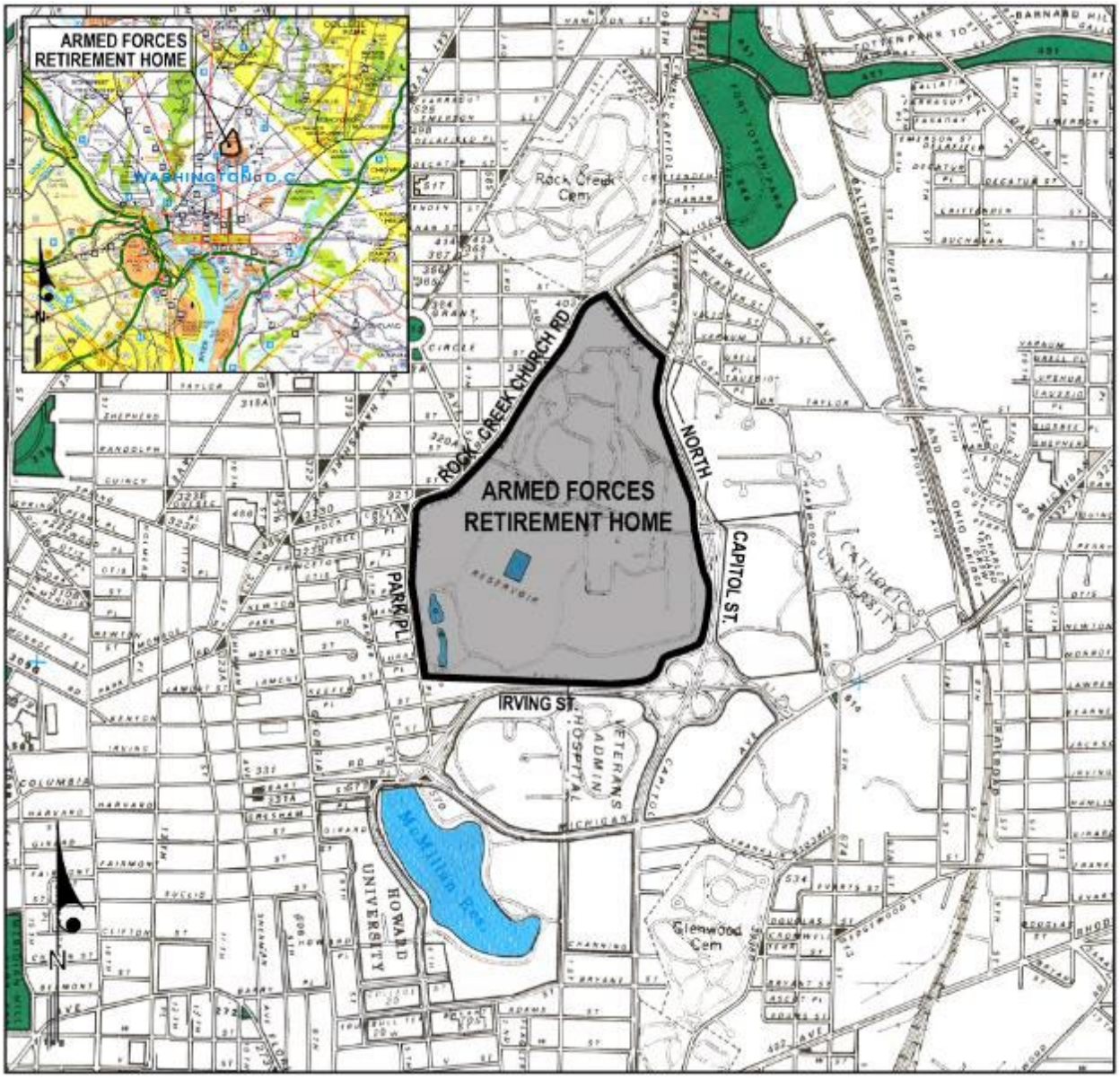

Figure 1: Regional Location Map

1.2 Purpose of the Proposed Action

The purpose of the proposed action is to amend the Master Plan for the Armed Forces Retirement Home (AFRH) Washington, DC, Campus (AFRH-W), as approved in 2008 and amended for the first time in 2018 to include the adaptive reuse of the Heating Plant into Zone A, to sustain AFRH and its primary funding source, 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.

In 1991, Congress merged the United States Soldiers' and Airmen's Home (USSAH), financed via a Trust Fund established in 1851 with funds provided by Congress after the Mexican-American War, and the United States Naval Home, historically funded by Navy appropriations, into a new and independent executive branch agency (i.e., AFRH). In merging them, Congress stipulated that the USSAH's Trust Fund will become the single, primary, and self-sustaining funding source for both Homes *and* a new headquarters organization. It also changed the operating model, directing the new AFRH to provide healthcare, services, and accommodations much as the private sector offers at continuing care retirement communities (CCRC), rather than serve as a transient asylum for indigent retired enlisted personnel. As a result, today's AFRH is the federal government's *only* accredited and certified CCRC offering a continuum of five levels of care to eligible residents: independent living, independent living plus, assisted living, long term care, and memory support. This merger, without fundamentally changing the financing model in law, placed significant burden on the now-AFRH Trust Fund: to this day, AFRH is financially constrained in performing its broad, valued, and unique mission.

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These long-standing income sources have proven insufficient to fund operations and improvements. As contributions to the Trust Fund have fallen over the last 14 years, operations and maintenance (O&M) and capital requirements, in comparison, have risen sharply due to the rising costs of healthcare, inflation, and deferred maintenance. Even its investments have been affected, as interest rates have considerably declined due to economic conditions (most recently surrounding the Coronavirus pandemic).

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To ameliorate its financial situation, AFRH has implemented several management initiatives: reduced its federal workforce by two-thirds; mothballed or leased vacant or underutilized buildings; consolidated operations; aligned its campuses under a single business model to increase efficiency; outsourced administrative roles and responsibilities to federal shared service providers; and secured performance-based contracts for transportation, trash removal, custodial services, facility maintenance, grounds maintenance, security, and dining services. While these initiatives have helped, they alone cannot cover the current gap between mandatory expenses and AFRH's current revenue streams.

Over the years, Congress has recognized AFRH's (and USSAH's) revenue challenges. In 1976, it authorized the USSAH to begin collecting resident fees to be placed in the Trust Fund to address O&M funding shortfalls. Seeing that fines and forfeitures were not returning to pre-2009 levels, Congress began in 2016 to appropriate $20M-$25M annually from the General Fund to fill the funding gap and support operations. It also directed AFRH and the Department of Defense, which has administrative oversight of the Home, to improve the Trust Fund's solvency by identifying new revenue sources, soliciting donations, and maximizing existing revenue sources. After providing a special appropriation of $80 million enabling AFRH to construct its new Scott Building, which opened in 2014, Congress appropriated only $1 million annually for capital construction and renovation between FY 2015 and FY 2019. The balance sheet acquisition value of AFRH's property, plant, and equipment was $398 million at the end of FY 2020 (minus $104 million accumulated amortization/depreciation including a $10 million charge in FY 2020). These minimal capital infusions equated to a capital expenditure ratio of only 0.25% and $889 per available unit, as opposed to the nationwide average per unit capital expenditure of $8,465 for private-sector CCRCs. Between FY 2020 and FY2022, Congress began course correcting, appropriating a total $28.3 million from the Trust Fund. This influx helped AFRH begin to address its backlog, although the pandemic critically affected AFRH's ability to execute.

AFRH's outdated and deteriorating facilities have a negative effect on its ability to attract and retain residents, and low occupancy exacerbates AFRH's financial problems by reducing fee income and driving higher fixed costs per resident. AFRH faces more than $50 million in near-term deferred maintenance and required capital improvement projects (at both AFRH-W and AFRH-Gulfport); $80 million in major renovations at AFRH-W to meet the evolving needs of current and future generations of residents, who are living longer, with chronic medical conditions, and who will have special housing and medical needs as they age; and approximately $500 million to execute the strategic building plan as envisioned in the Master Plan.

Therefore, to counter the persisting annual operating losses, generate funds to address its capital crisis, and ensure the financial stability of AFRH for future generations of retired military personnel, AFRH is leveraging its leasing authority under Title 24 United States Code §411 and maximizing the value of its underutilized facilities and acreage on the Washington DC campus. AFRH issued a request for proposal in 2018 to lease 80 acres on the property for a mixed-use development, selected a master developer one year later, and anticipates executing a long-term ground lease in the second quarter of FY 2023. The AFRH-W Master Plan will guide this initiative, which is expected to be a significant new revenue source for AFRH for the next century. This Environmental Impact Statement describes the effects of this new development on the environment.

This new development is AFRH's best opportunity to generate the predictable revenues necessary to continue providing the best housing and comprehensive support services in an independent living retirement community for America's retired enlisted personnel, and to develop future facilities for its changing population.

1.4 Project Objectives

The objectives of the AFRH-W Master Plan are to:

- Optimize development of the Home 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 AFRH new capital improvements on the north campus;
- Provide for the security of the residents of the Home;
- Encourage the rehabilitation and reuse of historic buildings;
- Avoid, minimize, and mitigate adverse effects on the Historic District resources that contribute to the historic character of the Home;
- Retain and enhance the form and function of existing landscape elements, such as topography, trees, and tree canopies;
- 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.

1.5 Site Background

In 1851, the property now known as AFRH-W was established as the northern branch of a new Congressionally organized US 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 US Presidents—Chester Arthur, Rutherford B. Hayes, James Buchanan and, most notably, Abraham Lincoln. In 1859, the US Military Asylum was renamed the U.S. Soldier's Home, and in 1972 the institution was again renamed the US Soldiers' and Airmen's Home.

In 1991, Congress incorporated the US 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 US Soldiers' and Airmen's Home and the US 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 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 (NRHP) and the District of Columbia Inventory of Historic Sites. Two smaller areas of the campus carry further designation as the President Lincoln and Soldiers' Home National Monument and the US Soldiers' and Airmen's' Home National Historic Landmark.

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 of the AFRH-W Master Plan to guide the development of its real estate in Washington, DC. The Master Plan provided the basis for directing future development by the private sector, thereby increasing revenue to the Trust Fund. The 2008 Master Plan also addressed the need for new facilities for AFRH-W.

The AFRH-W Master Plan and its Amendments divides the site into two zones: AFRH Zone and Zone A. The 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," will be leased to generate revenue for AFRH (see Figure 3).

The 2008 AFRH-W Master Plan and amendments include 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 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.

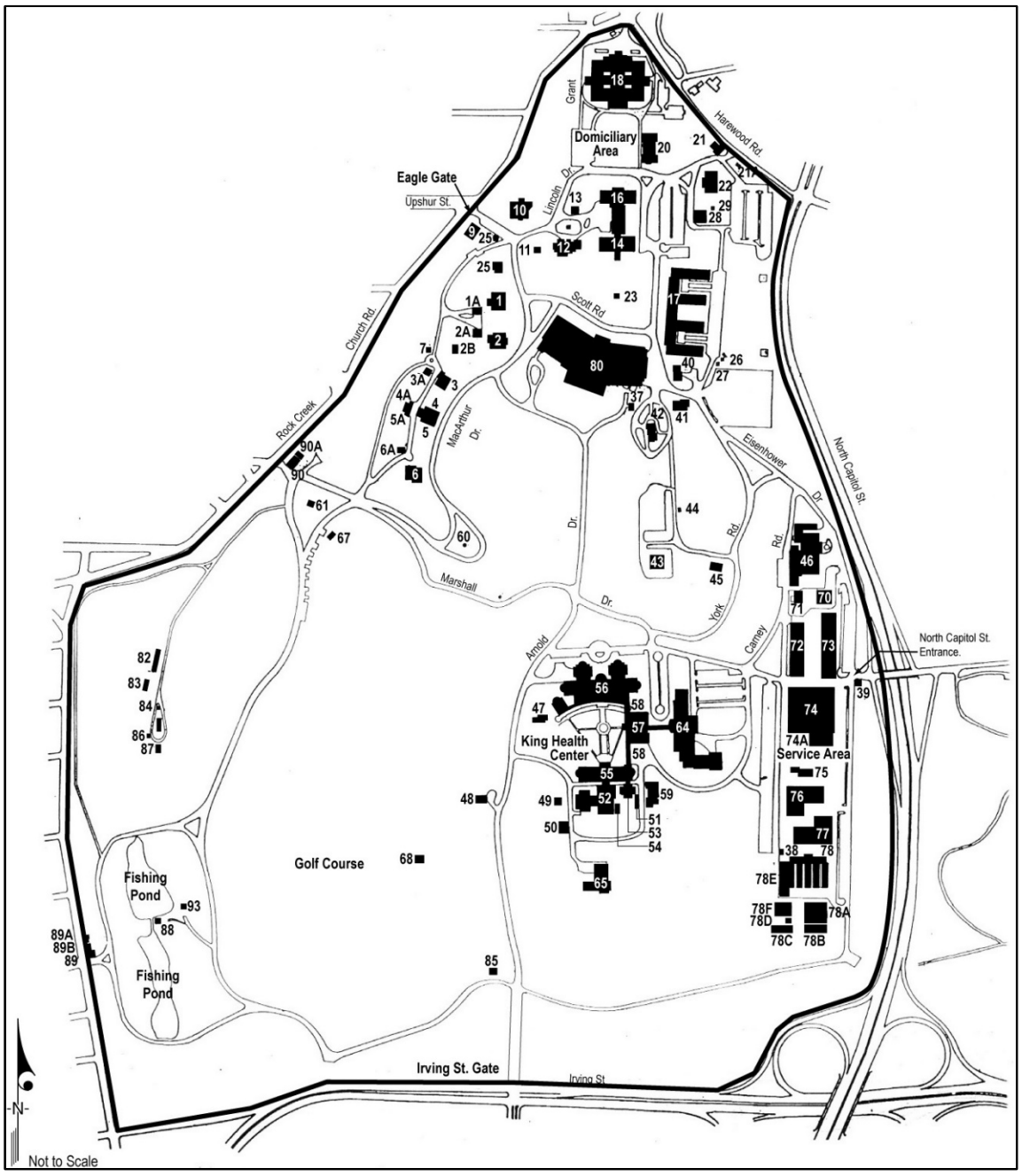

Figure 2: AFRH-W Campus

Per NCPC guidance, AFRH has prepared an amendment to the 2008 Master Plan and Amendment 1 that revises Zone A to include the former heating plant and incorporate minor changes to the Master Plan per the proposal by AFRH Partners. The inclusion of the Heating Plant in Zone A will 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 Amendments to guide future development of the AFRH-W facility.

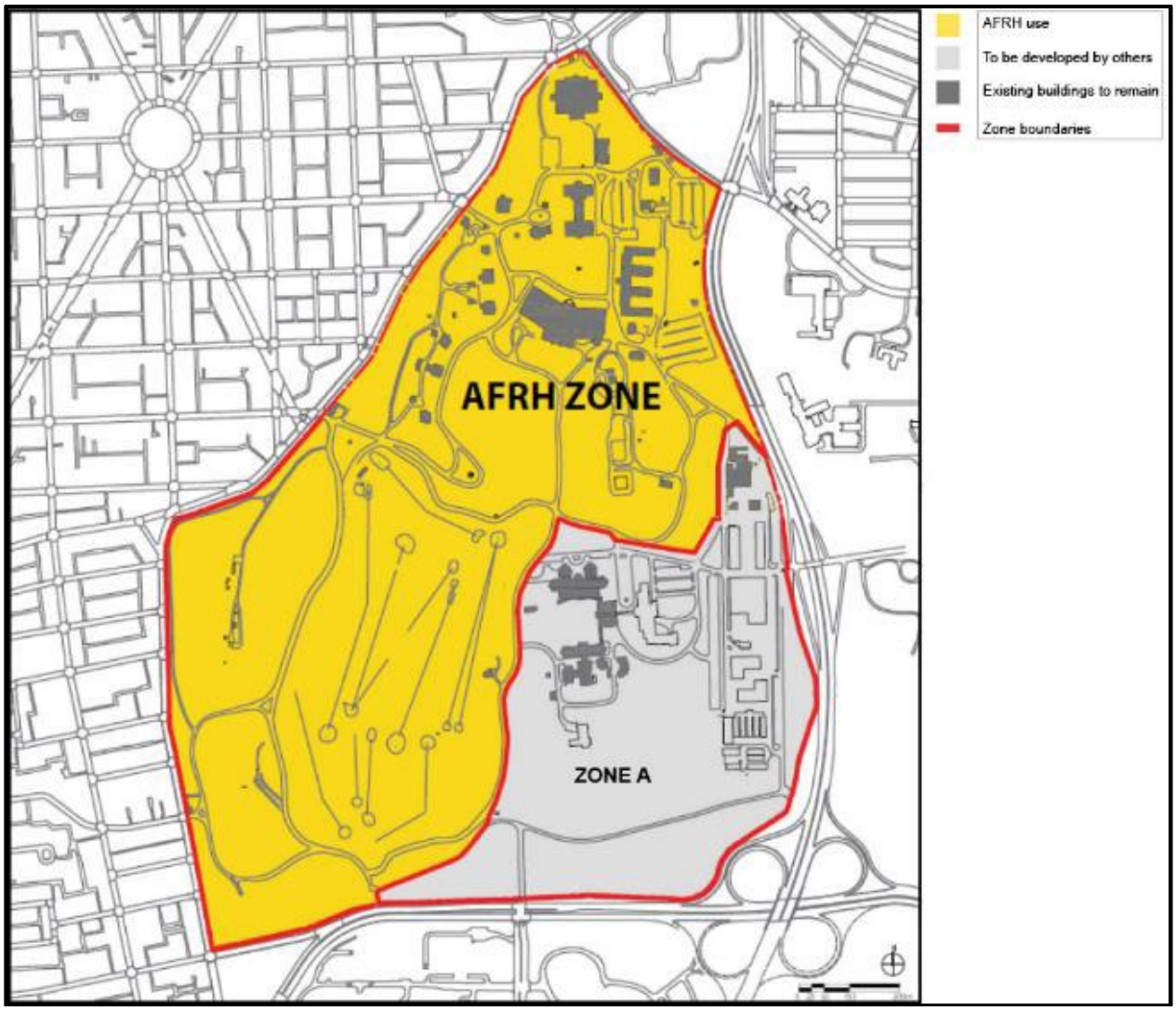

Figure 3: Master Plan Zones

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-W PA) with the National Park Service (NPS), NCPC, the Advisory Council on Historic Preservation (ACHP), and the District of Columbia State Historic Preservation Officer (DCSHPO) that enumerates the measures which will be undertaken to avoid, minimize, or mitigate potential adverse effects. The purpose of the AFRH-W PA 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 AFRH-W PA provides requirements for implementation of the AFRH-W Master Plan and its Amendments; 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, the AFRH-W 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 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 2008 AFRH-W PA, the Heating Plant site may be re-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 US General Services Administration (GSA) began the process of identifying a developer for AFRH-W. In March 2007, Crescent Resources LLC was selected as the preferred developer to construct a mixed-use redevelopment project of approximately 4.3 million gsf of new space on the southeast corner of the AFRH-W 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 LLC, and the redevelopment project was put on hold during the economic downturn.

In 2018, AFRH issued an RFP to solicit proposals for the redevelopment of Zone A. AFRH received five proposals from developers and a selected developer was chosen in November 2019. As detailed in *Chapter 2, Alternatives*, the AFRH Partners proposal provides approximately 4.9 million gsf mixed-use redevelopment of Zone A to include:

- 3.484 million gsf residential – multifamily rental, senior/continuing care retirement communities (CCRC), condominiums and townhomes, including 15 percent affordable housing
- 116,000 gsf hospitality (i.e., hotels)
- 1 million gsf office space
- 253,297 gsf retail space
- Adaptive reuse of historic buildings
- Preservation of open spaces
- Pedestrian accessibility and multimodal connection improvements

This Final SEIS incorporates minor changes based on the selected developer's proposal, and also assesses changes in environmental conditions, laws, and regulations that have occurred since the

issuance of the 2007 Final EIS. These development concepts are captured in this Final SEIS as Alternative 3: Master Plan Amendment 2.

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 SEIS. 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

- Clean Air Act (CAA) of 1970 as amended (42 United States Code [U.S.C.] § 7401, et seq.)
- Clean Water Act (CWA) of 1977 as amended (33 U.S.C. § 1251, et seq.)
- Coastal Zone Management Act (CZMA) of 1972 (6 U.S.C. §§ 1451–1464)
- 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)
- 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))
- Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C. § 6901, et seq.)
- National Energy Conservation Policy Act (42 U.S.C. §8231, et seq.)
- Energy Independence and Security Act (EISA) (42 U.S.C. §17001, et seq.)
- National Historic Preservation Act of 1966 (16 U.S.C. § 470, et seq.) (89 P.L. 665 (1966)); (referred to herein as “Section 106”)

1.8.2 Regulations

- Council on Environmental Quality Regulations (40 CFR Part 1500-1508)
- Protection of Historic Properties (36 CFR Part 800)
- Protection of Archaeological Resources: Uniform Regulations (32 CFR Part 229)
- Conformity of General Federal Actions to State or Federal Implementation Plans (40 CFR 6, 51, and 93)
- U.S. Army Corps of Engineers Regulations (33 CFR 320-332)
- Hazardous Substance Regulations (40 CFR Parts 300-399)
- Secretary of the Interior Standards and Guidelines for Archaeology and Historic Preservation (48 Federal Register 44716)

1.8.3 Plans

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

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

1.8.4 Executive Orders

- EO 14008, Tackling the Climate Crisis at Home and Abroad (January 27, 2021)
- EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (January 20, 2021)
- EO 13855, Promoting Active Management of America's Forests, Rangelands, and other Federal Lands to Improve Conditions and Reduce Wildfire Risk (December 21, 2018)
- EO 13693 – Planning for Federal Sustainability in the Next Decade
- EO 13690 – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input
- EO 13653 – Preparing the United States for the Impacts of Climate Change
- EO 13604, Improving Performance of Federal Permitting and Review of Infrastructure Projects (March 22, 2012)
- EO 13327 – Federal Real Property Management
- EO 13287 – Preserve America
- EO 13274, Environmental Stewardship and Transportation Infrastructure Project Reviews (September 18, 2002), amended by EO 13286 (February 28, 2003)
- EO 13212, Actions to Expedite Energy-Related Projects (May 18, 2001), amended by EO 13286 (February 28, 2003) and EO 13302 (May 15, 2003)
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001)
- EO 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000)
- EO 13112, Invasive Species (February 3, 1999), Amended by EO 13286 (February 28, 2003) and EO 13751 (December 5, 2016)
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), Amended by EO 12948 (January 30, 1995)
- EO 11991, Relating to Protection and Enhancement of Environmental Quality (May 24, 1977), amending EO 11514 (March 5, 1970)
- EO 11990, Protection of Wetlands (May 24, 1977), as amended by EO 12608 (September 9, 1987)
- EO 11988, Floodplain Management (May 24, 1977), as amended by EO 12148 (July 20, 1979)
- EO 11593 – Protection and Enhancement of the Cultural Environment
- EO 11514, Protection and Enhancement of Environmental Quality (March 5, 1970), as amended by EO 11991 (May 24, 1977)

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. The scheduled dates for the remaining actions will be maintained as closely as possible.

Table 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 12, 2018
Public Hearing on Draft SEIS	December 13, 2017
Publication of Notice of Availability for Final SEIS	March 2022
Public Review Period on Final SEIS	March – April 2022
ROD	June 2022

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 in the SEIS. This decision will be documented in a ROD that will identify the selected alternative and any proposed mitigation measures.

1.11 Organization of the SEIS

Consistent with the CEQ regulations, this SEIS 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 update to the 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 responses to comments received on the Draft SEIS.
- Chapter 5 contains references for studies, data, and other resources used in the preparation of this SEIS.
- Chapter 6 contains a list of people involved in the preparation of this document.
- Chapter 7 contains the distribution list for this SEIS.

Appendix A contains the transportation analysis that was prepared for DDOT.

2.0 Alternatives Including the Proposed Action

As stated in *Chapter 1, Purpose of and Need for the Proposed Action*, the proposed action assessed in this document is to reflect changes made to the 2008 AFRH-W Master Plan. The proposed action incorporates minor changes based on the selected developer's proposal, and also assesses changes in environmental conditions, laws, and regulations that have occurred since the issuance of the 2007 Final EIS. 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 will occur through a lease of Zone A.

2.1 Alternatives Studied in Detail

2.1.1 Alternative 1: No Action Alternative

Under the No Action Alternative, the action proposed in this SEIS will not be taken. AFRH-W will remain under federal ownership, with AFRH as the holding agency. No additional new construction will occur on AFRH-W, as proposed in the 2008 Master Plan, under this alternative. The site will continue to be underdeveloped, with scattered, unused, and mostly non-revenue producing buildings. The facility will 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 will be limited to the reuse of existing buildings, including the Grant Building, and the King Hospital Complex. A total of approximately 538 parking spaces will 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 *Chapter 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 Alternative 2: Master Plan Amendment 1

Alternative 2 is comprised of the development proposed in the 2008 AFRH-W Master Plan and also includes the adaptive reuse of the Heating Plant in Zone A. This alternative was partly studied in the 2007 Final EIS as Alternative 3A, which was selected for implementation in the 2008 ROD. Within the 2008 AFRH-W 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 first amendment to the AFRH-W Master Plan changes the boundaries of the development zones to shift a three-acre Heating Plant parcel from the AFRH Zone to Zone A (see Figure 1-3). Development in the AFRH Zone will take place as AFRH needs new facilities. The AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There will be moderate in-fill development within this zone. Development in Zone A will be undertaken by a private developer to generate income for the AFRH

Trust Fund. Zone A is designated for residential, office/research and development, retail, hotel, and medical uses. This alternative was memorialized in the AFRH-W Master Plan Amendment 1.

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

Table 2: Proposed Development for Alternative 2: Master Plan Amendment 1

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.

Alternative 2 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.

2.1.3 Alternative 3: Master Plan Amendment 2 (Preferred Alternative)

Alternative 3: Master Plan Amendment 2 includes development in the AFRH Zone and Zone A, as identified in Master Plan Amendment 1, with the Heating Plant Area included in Zone A and includes the development proposed by AFRH Partners for Zone A. The alternative does not include changes to the development plan or design guidelines for the AFRH Zone, and all substantive changes are limited to Zone A. The alternative accommodates minor changes to the parcel plan in Zone A, responds to changes in local planning strategies and priorities since 2008, and reflects a more objective-based and context-specific approach to design guidelines for new development in Zone A. The alternative also accommodates a small increase in density in Zone A, as well as more flexibility in use and product type while maintaining all previously approved guidelines related to height and view shed protection. Development in Zone A is based on the proposal by AFRH Partners, the selected developer, who

provides 4.9 million gsf of mixed-use development consisting of residential, hospitality, office, and retail uses to generate income for the AFRH Trust Fund.

A summary of the development proposed in Master Plan Amendment 2 is included below in Table 3.

Table 3. Proposed Development for Alternative 3: Master Plan Amendment 2

LAND USE			
	Height (# of Feet)	**Gross Square Footage**	**Parking Spaces**
EXISTING & TO REMAIN		**1,320,615**	
Institutional		1,320,615	
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	**4,906,075 ***	**4,844**
Residential		3,175,177	
Commercial		732,846	
Medical		319,077	
Retail		253,297	
Asst. Living		309,678	
Hotel		116,000	
TOTAL NEW DEVELOPMENT		**5,304,075****	
AFRH GRAND TOTAL		**6,624,690**	**5,586**

* 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 Zone A will depend upon the final square footages associated with each land use and the applicable parking ratios, but will be capped at the value shown in the table above.

** 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.

Alternative 3 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:

- Providing the best Master Plan to sustain AFRH and its primary source of funding, the AFRH Trust Fund;
- Maximizing development of AFRH-W while maintaining the historic character of the site and retaining significant existing open space;
- Providing development uses that are complementary to the Home;
- Ensuring that AFRH's facilities are conveniently located for its residents and that there is room for new AFRH facilities on the north campus;
- Providing for the security of the residents of the Home;
- Encouraging the rehabilitation and reuse of historic buildings;
- Integrating the landscape and the built form; and
- Where appropriate, respecting the character of the adjacent communities and integrating the new development into the city fabric.

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 DoD 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 will 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 will not likely be sufficient to meet AFRH's immediate capital requirements. For these reasons, AFRH's need is best met by land development alternatives guided by a Master Plan. Therefore, this alternative was dismissed from further consideration.

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

- The creation of a private city golf club will 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 outside of the secured AFRH Zone as part of the Zone A redevelopment. However, a more robust land development strategy is necessary to maximize revenue to support AFRH's mission while replenish the Trust Fund. Therefore, this alternative was dismissed from further consideration.

Extend Soldiers' Home Cemetery

- Extending the Soldiers' Home Cemetery will 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 alternatives to developing AFRH-W to determine whether they were feasible and whether they will 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 2007 ROD. 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 will have accommodated the development outlined in Table 4. 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 4: 2007 Final EIS Alternative 2 Proposed Development

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

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

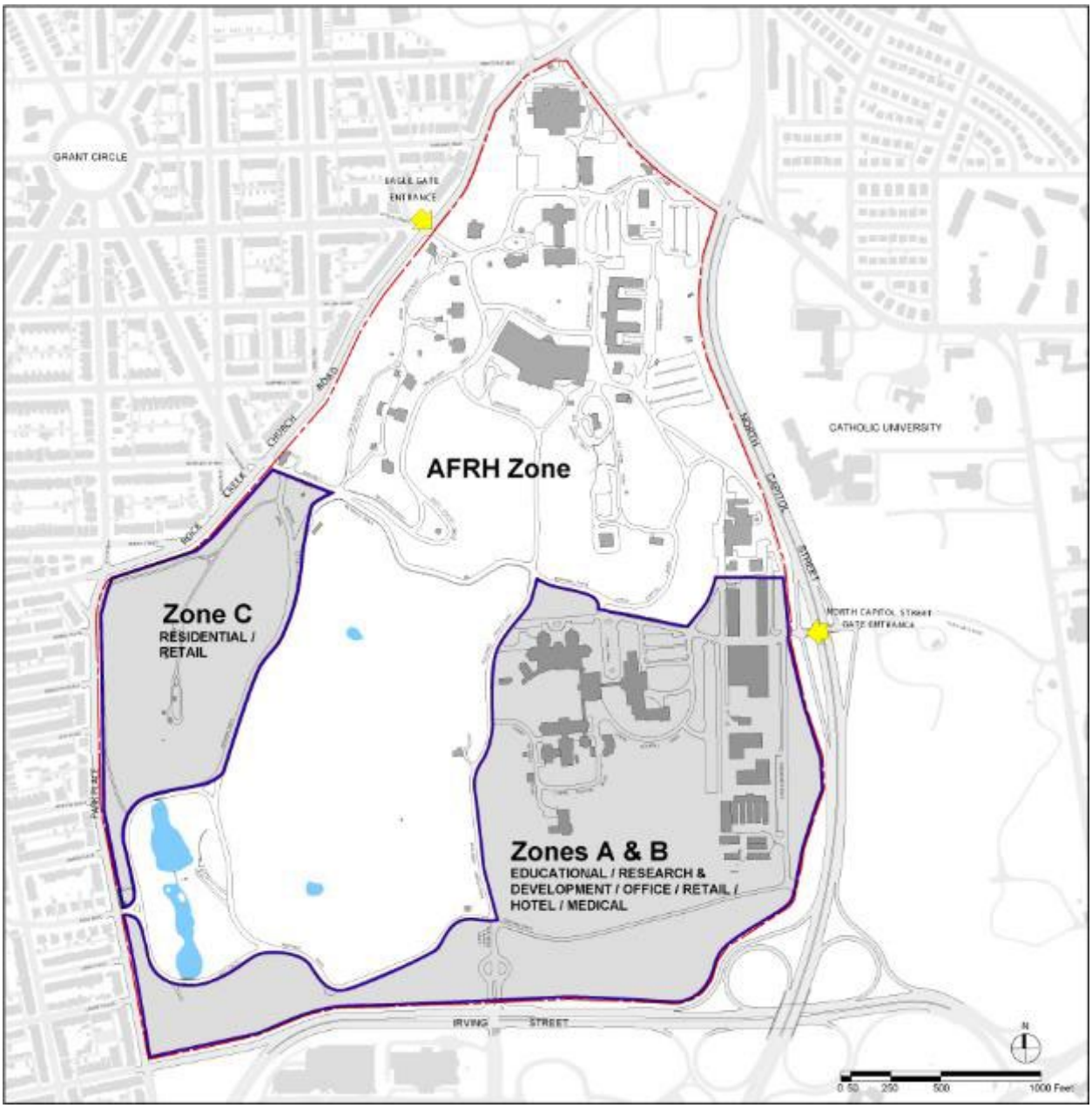

Figure 4: 2007 Final EIS Alternative 2 Development Zones

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 5. Figure 5 delineates the distribution of development uses under Alternatives 3B and 3C on the four AFRH-W development zones.

Table 5: 2007 Final EIS Alternatives 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 will be moderate in-fill development within this zone. In addition, several holes on the golf course will be relocated. All alterations to the golf course will 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 will take place at a later time.

Figure 5: 2007 Final EIS Alternatives 3B and 3C Development Zones

2007 Final EIS Alternative 4

Under Alternative 4, as studied in the 2007 Final EIS, AFRH-W will have accommodated the development outlined in Table 6. 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 6: 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 6 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 will be moderate in-fill development within this Zone.
- Zones A and B will be developed with residential, office, and retail uses.
- Zone C will contain residential development.

Figure 6: 2007 Final EIS Alternative 4 Development Zones

2.3 Summary of Impacts

Table 7 provides a comparison of impacts of the alternatives. Detailed information on impacts is located in *Chapter 3, Affected Environment and Impacts to the Human Environment*.

Table 7: Summary of Impacts

Resource Topic	Alternative 1: No Action Alternative	Alternative 2: Master Plan Amendment 1	Alternative 3: Master Plan Amendment 2
Stormwater Management	No direct, indirect or cumulative impacts will occur.	Construction activities and the permanent increase in impervious surface from the development of Zone A will result in direct, short and long-term, adverse impacts.	
Greenhouse Gases and Climate Change	No direct, indirect or cumulative impacts will occur.	Implementation of the AFRH-W Master Plan and related construction activities will have direct, short and long-term adverse impacts on GHGs and climate change. Indirect, long-term, adverse impacts will result from an increase in electricity use after the proposed development is complete.	
Air Quality	Existing traffic conditions in the area have resulting moderate, long-term, adverse impacts to air quality. Existing stationary sources result in negligible, long-term, adverse impacts. The No Action Alternative will not add to the impacts and conforms to the *Washington Metropolitan Region SIP*	The conformity analysis demonstrates general conformity with the emission limits set forth under CAA Section 176(C). There will be no exceedances of the CO 1-hour and 8-hour NAAQS for carbon monoxide. There will be minor, long-term, adverse impacts from anticipated stationary sources. Emissions from construction equipment will vary over time, which will result in minor, short-term, adverse impacts.	
Land Use, Planning, & Zoning Office	No direct, indirect or cumulative impacts will 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 will result in a major, long-term, adverse impact.	The Master Plan Alternative will result in major, long-term, adverse impacts to traffic in the area. There will also be direct and indirect, major, long-term, adverse impacts to the areas transit systems. The existing internal bicycle and pedestrian network and the improvements to the external network will enhance bike and pedestrian access through the site and the region resulting in beneficial impacts.	
Environmental Contamination	No direct, indirect or cumulative impacts will occur.	The removal of hazardous waste and contaminants in the buildings and on the site will have a direct, long-term, minor, beneficial impact.	

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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 that implementation of the Master Plan will have on the site. Implementation of the Master Plan Amendment 2 will 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 and operation of the AFRH-W redevelopment. Impacts can also occur both directly on the site of AFRH-W and off-site (for instance, employees commuting to the new mixed-used development will affect existing traffic on nearby roads). Cumulative impacts from implementation of the Master Plan Amendment 2, 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:

- US Environmental Protection Agency (EPA) analyses and reports
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Surveys
- Federal Emergency Management Agency (FEMA) floodplain maps
- USACE wetland manuals
- US Fish and Wildlife Service (USFWS) threatened and endangered species lists and National Wetland Inventory (NWI) maps
- Federal Highway Administration (FHWA) traffic guidance
- Environmental Site Assessments (ESAs)
- DC SHPO
- DC Department of Energy and Environment (DOEE) erosion and sediment control and stormwater design manuals
- District Department of Transportation (DOOT)
- 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 will 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 will 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 a rea, 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 (VA) Hospital, and Irving Street (AFRH Master Plan 2008). A detailed Erosion and Sedimentation Control Plan will be developed prior to construction in accordance with the 2013 *Rule on Stormwater Management and Soil Erosion and Sediment Control* (2013 Stormwater Rule), as amended January 31, 2020, using practices and approaches from DOEE's *Erosion and Sediment Control Manual* (2017). Development of this plan, with review and approval by DOEE, will ensure that appropriate measures are enacted during construction to minimize soil erosion and transport into District waters, including the District sewer system.

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 will be no direct impacts to groundwater hydrology or quality. The proposed development will 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 will be negligible. In addition, a large amount of pervious vegetated surface, particularly in the region of the golf course at AFRH-W, will 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 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 will be required. No construction is proposed in the region of the fishing ponds or the golf course. No other wetland areas will be impacted by the implementation of the Master Plan. Best Management Practices (BMPs) will 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 Flood Insurance Rate Maps prepared by FEMA, the site falls within an Area of Minimal Flood Hazard (FEMA 2010).

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 USC 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 will 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 will occur; however, most of the existing green space and forested areas will 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 will only be temporary. During construction, the developer will be required to adhere to a Landscape Plan that will minimize impacts to forested areas and critical root zones and require revegetation of removed or damaged vegetation. Onsite stormwater management controls will be implemented in accordance with the 2013 Stormwater Rule, as amended January 31, 2020, 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, potential habitat exists for the Northern Long-eared Bat (*Myotis septentrionalis*) (USFWS, 2022). This species only needs to be considered when there is tree clearing greater than or equal to 15 acres (USFWS, 2022). Master Plan Amendment 2 will not require the clearing 15 or more acres of trees.

Because no known listed threatened or endangered species will 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 7). Table 8 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.

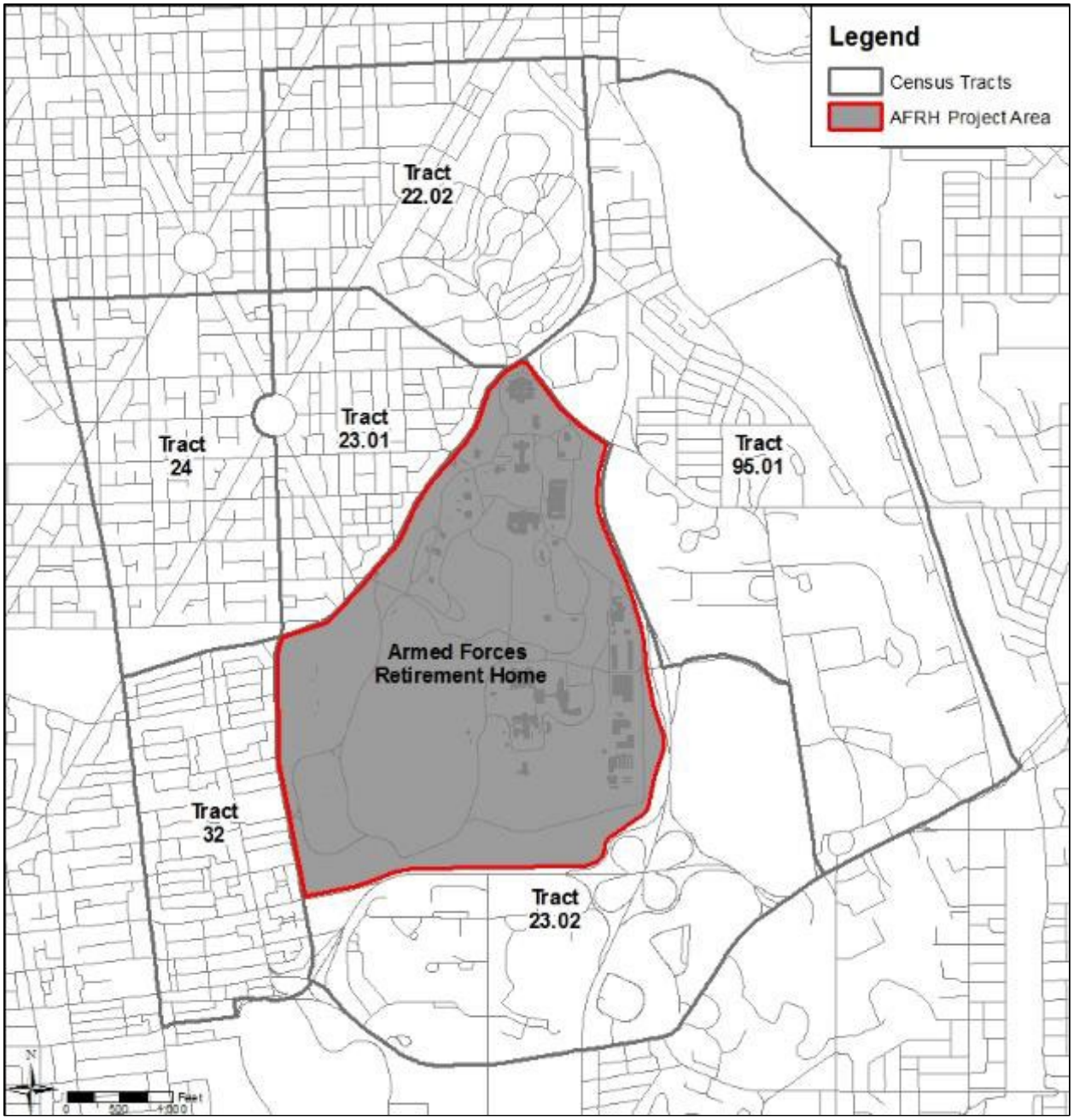

Figure 7. Study Area Census Tracts

Table 8: 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 9).

Table 9: 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 will result in a population increase of 6,000 individuals relocating to new housing units. The developer will construct affordable housing units as part of the development of parcels that include residential apartments and condominiums. Fifteen percent of the units will be available and affordable to households earning, as a maximum, between 60 and 80 percent of the Area Median Income. The affordable units will 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 will be assumed as 60 percent one-bedroom, 30 percent two-bedroom, and 10 percent three-bedroom. The 2007 Final EIS concluded that new residential development and an increase in affordable housing, both proposed in the Master Plan, will 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 will 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 will 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.

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 will be no disproportionately high or adverse impacts on minority or low-income populations. Impacts to minority and low-income populations will not differ from impacts to the population as a whole. In addition, the creation of affordable housing and transitional housing for homeless veterans will 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 will 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 will likely benefit from the increase in tax base and local population caused by the development of AFRH-W. The public will also benefit from the creation of publicly accessible bicycle paths, pedestrian paths, pocket parks, large open meadows, and a green buffer around the entire perimeter of the project area. No changes to the 2008 Master Plan have been proposed that will 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 education, 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 residents on AFRH-W property due to the additional residential, office, research and development, institutional, retail, hotel, and medical uses. In addition, construction activities will lead to the purchase of building materials, construction supplies and construction equipment, as well as spending by the construction workers, which will 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 will provide business opportunities for small, disadvantaged, women-owned, veteran-owned and service-disabled veteran-owned small businesses. The Zone A developer will 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 will benefit the economy and employment rates in the region.

The proposed increase in residential development and subsequent economic impacts will 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 will result in new revenues generated through the sale or lease of land on AFRH-W, which will replenish the AFRH Trust Fund. As a federal agency, AFRH will not directly contribute property tax revenues to the District of Columbia. Taxes will 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 will 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 will be in accordance with the tax status of the lessee or user.

In addition, the presence of AFRH in the District will 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 will provide beneficial impacts to the city.

Increased sales transactions for the purchase of materials and supplies will 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 will increase resulting in direct, short-term, minor, beneficial impacts.

The proposed increase in residential development and the potential increase in tax revenue will 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 60) to the US Capitol Building. Viewshed 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 US Soldiers' and Airmen's Home National Historic Landmark. Construction on the McMillan site is underway.

In 2007, at the request of the DC SHPO, AFRH developed a Historic Preservation Plan (HPP) 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.

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

As an update 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 will result in the adaptive reuse of the contributing resources and the demolition of 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 (URR #40), and the DC SHPO concurred that the action will 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 HPP (2007) and AFRH-W PA (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 USDA, as well as local cultural resource management reports and the 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 archaeological assessment 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, 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 also suggested in this assessment.

No changes to the Master Plan have been proposed that will increase the likelihood of discovering or disturbing archaeological resources. Therefore, no further analysis of archaeological resources is necessary for this SEIS.

3.2.6 Noise

The 2007 Final EIS concluded that the implementation of the Master Plan will alter traffic volumes and patterns, but will not result in excessive noise increases to noise-sensitive areas. Temporary construction noise is unavoidable, but the extent and severity of the noise impact will 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 will include noise reduction measures.

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

3.2.7 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 will be designed to ensure adequate capacity to supply the average and peak hourly demands of the buildings on-site. The proposed project will require new water transmission lines and easements, which will 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 will contribute to the existing problems caused by the combined sewer system in the District. The Master Plan will 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 will be required following the Master Plan implementation is substantially higher than current power usage at the site. Implementation of the Master Plan will 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 will 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 will 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 will 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 will be required following the Master Plan implementation is substantially higher than current natural gas usage at the site. Implementation of AFRH-W Master Plan will require the extension of gas lines from existing on-site or adjacent services to new buildings. The relocation of and connection to gas lines will be completed with the least amount of disruption possible to current users, although some traffic disruptions may occur. Energy conservation measures will 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 will require the extension of communication lines for data and communication systems. The relocation of and connection to communications lines will 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 will 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

Solid and medical waste will be generated during operation of the buildings on-site. Commercial trash generators are required by law to separate recyclable refuse and deliver these materials to a recycling center. Private hauling services will dispose of the solid waste generated on-site. All bio-medical waste will 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 will temporarily increase during construction due to demolition of buildings on the property and disposal of construction materials.

Recycling programs will 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 alternatives. Each alternative described in Chapter 2 will 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
- Air Quality
- 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 Department of Energy and Environment (DOEE) released the 2013 Stormwater Rule, which amended 21 DCMR 5 (DDOE 2013). The District also adopted a new Stormwater Management Guidebook (SWMG; DDOE/CWP 2013), incorporated herein by reference, which superseded an earlier 2003 version. In 2019, DOEE proposed revisions to the 2013 Stormwater Rule and on January 31, 2020, issued a final rulemaking that amended the 2013 Stormwater Rule. The SWMG (DOEE 2020) was also updated to be consistent with the regulatory amendments, to incorporate technical changes to stormwater BMP design standards, and to clarify existing guidelines and processes. Due to the change in stormwater regulations, the stormwater management strategies proposed in the 2008 Master Plan have been reevaluated in this SEIS to ensure compliance with the Stormwater Rule, as amended.

The 1988 regulations and the 2003 SWMG emphasized 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 required stormwater quantity controls that limit stormwater discharge to pre-development flows. The 2013 Stormwater Rule, as amended, 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 and the District sewer system. According to the Stormwater Rule, regulated sites that undergo a major land-disturbing activity, or a major substantial improvement activity must employ BMPs and post-development land cover necessary to achieve the water quality treatment volume (WQTv) equal to the difference between the post-development runoff from the 95th percentile applicable rainfall event, as measured for a 24-hour storm with a 72-hour antecedent dry period, and the stormwater retention volume (SWRv). Since the implementation of the Master Plan and its Amendments will be considered a major land-disturbing activity, the applicable rainfall event for the AFRH-W area is 1.2 inches. In summary, under the current Stormwater Rule, as amended, 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 2020 SWMG.

As described in the 2007 Final EIS, Zone A contains two general drainage areas. The western drainage area drains to the concrete flume and piped stormwater system into the 30-inch combined sanitary/ storm sewer pipe located adjacent to the Irving Street and First Street intersection. The eastern drainage area drains through a piped stormwater system and concrete and stone channels into the 42-inch storm drain located west of the North Capitol Street/Irving Street interchange. AFRH-W is within DC Water's combined sewer outfall (CSO) 019 sewershed, which drains to the Anacostia River. The majority of untreated overflows from CSO 019 are captured and conveyed by DC Water's Anacostia River Tunnel, constructed in 2016, to the Blue Plains Advanced Wastewater Treatment Plant for treatment before being discharged into the Potomac River.

3.4.1 Impacts to Stormwater Management

3.4.1.1 Alternative 1: No Action Alternative

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

3.4.1.2 Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2

The implementation of Master Plan Amendment 1 will 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 and Master Plan Amendment 2 will result in a total increase of 29.2 acres of impervious surface area on the AFRH-W site, or an additional 11 percent of the overall project area (Table 10). No additional impervious area beyond the amount described in the Master Plan and its Amendments is proposed in this SEIS.

Table 10: Impervious Area

	Total Acreage	Total Impervious Area (Acres)			Percent Impervious Area		
		Existing/ No Action Alternative	Alternative 2	Alternative 3	Existing/ No Action Alternative	Alternative 2	Alternative 3
The AFRH Zone	191	15.2*	26*	26*	8%	14%	14%
Zone A	80	36.9	46	55.3	46%	57%	69%
Total	272	52.1	72	81.3	19%	26%	30%
Difference	-	-	+19.9	+29.2	-	+7%	+11%

*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.

Due to the implementation of the 2020 SW Rule, new calculations of post-development stormwater retention volume requirements were conducted. The SWRv required to mitigate the implementation of this master plan was estimated using the methodology outlined in the SWMG. The resulting SWRv can be found in (Table 11). 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.

Table 11: Stormwater Retention Volume Requirements

	Impervious Area (Sq. Ft.)	Water Quality Detention Vol. (Cu. Ft.)
Alternative 2: Master Plan Amendment 1		
The AFRH Zone	1,132,560	88,906
Zone A	2,003,760	173,826
Alternative 3: Master Plan Amendment 2		
The AFRH Zone	1,132,560	93,436
Zone A	2,408,868	218,906

(Source: DC Storm Water Management Guidebook, 2013)

For the analysis for Alternative 2, it was assumed that 86 percent of total acreage within the AFRH Zone will be considered natural cover and 14 percent will be Impervious cover. Within Zone A, it was assumed that 43 percent of the total acreage will be considered "natural cover" and 57 percent will be impervious cover. Hence, the goal for pollutant removal loads for these two zones have been outlined in the table below. Removal of pollutant loads should be accomplished by the implementation of approved best management practices (BMPs) (Table 12).

Table 12: Estimate of Total Annual Pollutant Loads (lbs/yr) for Alternative 2

	Total Suspended Solids	Total Phosphorous	Total Nitrogen	Zinc
the AFRH Zone	46	105	805	8
Zone A	92	461	3546	33

(Source: DC Storm Water Management Guidebook, 2003)

For the analysis for Alternative 2, it was assumed that 86 percent of total acreage within the AFRH Zone will be considered natural cover and 14 percent will be Impervious cover. Within Zone A, it was assumed that 31 percent of the total acreage will be considered "natural cover" and 69 percent will be impervious cover. Hence, the goal for pollutant removal loads for these two zones has been outlined in the table below. Removal of pollutant loads should be accomplished by the implementation of approved best management practices (BMPs) (Table 13).

Table 13. Estimate of Total Annual Pollutant Loads (lbs/yr) for Alternative 3

	Total Suspended Solids	Total Phosphorous	Total Nitrogen	Zinc
the AFRH Zone	46	105	805	8
Zone A	127	674	5162	48

The development proposed in Master Plan and its Amendments will comply with District of Columbia regulations to maintain post-development storm water quantity and quality at pre-development levels.

Throughout the Master Plan and its Amendments, 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 and its Amendments 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. While the 2008 Master Plan recommends providing two stormwater management ponds to satisfy stormwater retention volume requirements for Zone A, 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 require additional stormwater retention BMPs in order to eliminate the two traditional ponds and achieve compliance with the 2020 SWM Rule.

Construction on AFRH-W campus will 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 will be temporary, lasting the duration of construction, and will be mitigated by the use of sediment and erosion control measures described below.

Mitigation Measures

A combination of smaller, decentralized BMPs and an existing dry pond will be utilized to satisfy the water quantity and quality management volume. The existing dry pond is located within the Pasture immediately northwest of the intersection of Pershing Drive and First Street.

If all of the water quantity management requirements within a drainage area can be met by smaller BMPs that are designed to serve individual buildings or paved areas, then the existing stormwater management pond serving that drainage area may remain as a dry detention basin providing stormwater quantity management only. If both water quality and quantity goals for a given drainage area are to be met by a pond, then it will likely consist of a permanently wet retention pond or a combination of a pond and constructed wetland areas that provide water quality to be consistent with the 2020 stormwater regulations.

The Master Plan and its Amendments have 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 SWMP and a Soil Erosion and Sediment Control Plan will be prepared in accordance with the amended 21 DCMR 5 and the 2020 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

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 AFRH.

Common GHGs include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). HFCs and PFCs are mainly used as refrigerants; SF_6 is found in electrical equipment; and NF_3 is used in the plasma etching of silicon wafers and in the manufacturing of electronics. SF_6 and NF_3 are not included in this assessment. For this assessment, the focus of the analysis of GHGs is on CO_2, CH_4, and N_2O 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 will not be substantive and are therefore not further assessed. In addition, the project will not use NF_3, and any electrical equipment containing SF_6 will be subjected to monitoring and maintenance and will be owned and managed by the electrical utility.

For this assessment, GHGs are converted and reported as metric tonnes of carbon dioxide equivalents (tCO_2e). This is a standard practice that simplifies emission reporting with CO_2e representing the sum of the individual GHGs, weighted to represent the atmospheric effects of individual GHGs in comparison to CO_2. 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 CO_2. The GWPs of CO_2, CH_4 and N_2O 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 2019, city-wide GHG emissions fell by 31 percent (DOEE 2022).

Greenhouse Gas Emissions

According to the Unites States National Inventory Report for 2020 (most recent publicly available data), the quantity of GHG emissions released to the atmosphere by the country was 5,215million metric tonnes (Mt) of CO_2e (IEA 2022). Global GHG emissions in 2019 have been estimated to be 33,400 $MtCO_2e$ (excluding land use change and forestry) (IEA 2022). Therefore, the contribution to global GHG emissions by the United States is approximately 16 percent.

The District of Colombia was responsible for approximately 7.2 $MtCO_2e$ in 2019, which represents approximately 0.1 percent of the country's total CO_2 emissions in that year (5,512 $MtCO_2e$) (DOEE 2022). Approximately 24 percent of the emissions in the District of Columbia are attributed to vehicles and transportation (DOEE 2022).

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 2018 (USGCRP 2018). The 2018 report notes the following observations for the Northeast region (which includes Washington, D.C.):

- "*The seasonality of the Northeast is central to the region's sense of place and is an important driver of rural economies. Less distinct seasons with milder winter and earlier spring conditions are already altering ecosystems and environments in ways that adversely impact tourism, farming, and forestry. The region's rural industries and livelihoods are at risk from further changes to forests, wildlife, snowpack, and streamflow.".*
- *"The Northeast's coast and ocean support commerce, tourism, and recreation that are important to the region's economy and way of life. Warmer ocean temperatures, sea level rise, and ocean acidification threaten these services. The adaptive capacity of marine ecosystems and coastal communities will influence ecological and socioeconomic outcomes as climate risks increase.".*
- *"The Northeast's urban centers and their interconnections are regional and national hubs for cultural and economic activity. Major negative impacts on critical infrastructure, urban economies, and nationally significant historic sites are already occurring and will become more common with a changing climate.".*
- *"Changing climate threatens the health and well-being of people in the Northeast through more extreme weather, warmer temperatures, degradation of air and water quality, and sea*

level rise. These environmental changes are expected to lead to health-related impacts and costs, including additional deaths, emergency room visits and hospitalizations, and a lower quality of life. Health impacts are expected to vary by location, age, current health, and other characteristics of individuals and communities."

- *"Communities in the Northeast are proactively planning and implementing actions to reduce risks posed by climate change. Using decision support tools to develop and apply adaptation strategies informs both the value of adopting solutions and the remaining challenges. Experience since the last assessment provides a foundation to advance future adaptation efforts."*

3.5.1 Impacts to Greenhouse Gases and Climate Change

3.5.1.1 Alternative 1: No Action Alternative

Under the No Action Alternative, AFRH-W will remain under Federal ownership, maintain its current operations and no changes in GHG emissions will occur. Therefore, there will be no additional direct, indirect or cumulative impacts to GHG emissions or a resulting contribution to climate change arising from the No Action Alternative.

3.5.1.2 Alternative 2: Master Plan Amendment 1 and Alternative 3 Master Plan Amendment 2

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, will generate GHG emissions. Although construction of AFRH-W will extend over a 10-year period, the intensity, duration, location and type of construction and resulting emissions will vary over time. Therefore, development under Alternatives 2 and 3 will have short-term, minor, adverse impacts on GHGs and climate change. The extent of construction is relatively small and thus will 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 CO_2 emissions from vehicle traffic are directly related (as both are products of gasoline and diesel combustion), it is reasonable to expect that there will also be a small increase in CO_2 emissions from construction-related traffic. The combustion of gasoline and diesel in vehicles will also yield quantities of CH_4 and N_2O, although they will be small in comparison to CO_2 (even in consideration of GWPs).

Although the changes in GHG emissions arising from AFRH-W will be small and inconsequential in relation to the overall traffic volumes in the District of Columbia, Alternatives 2 and 3 will 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, adverse impact on GHG emissions and their associated contribution to climate change.

An analysis of air contaminant emissions from stationary sources was completed for Alternatives 2 and 3 based on the additional new natural gas fired boiler capacity that will be required to support the Alternatives. The results are presented in Table 14.

The estimated GHG emissions from the new natural gas boiler capacity for Alternative 2 is 20,952 tCO_2e/year. The estimated CO_2e emissions from Alternative 2 represents approximately 0.29 percent of the overall CO_2e emissions released by the District of Columbia (7.2 $MtCO_2e$ in 2019) (DOEE 2022), or 0.0004 percent of the overall CO_2e emissions released by the United States (5,215 $MtCO_2e$ in 2019).

The estimated GHG emissions from the new natural gas boiler capacity for Alternative 3 is 26,324 tCO_2e/year. The estimated CO_2e emissions from this alternative represents approximately 0.37 percent of the overall CO_2e emissions released by the District of Columbia (7.2 $MtCO_2e$ in 2019) (DOEE 2022), or 0.0005 percent of the overall CO_2e emissions released by the United States (5,215 $MtCO_2e$ in 2019).

Although the changes in GHG emissions arising from the boilers will be small, Alternatives 2 and 3 will 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 adverse impact on GHG emissions and their associated contribution to climate change.

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 will not be substantive and these are therefore not assessed further.

Indirect GHG emissions from electricity use will be the largest indirect GHG impact. The 2007 Final EIS and this Final SEIS state that the electricity demand from AFRH-W will 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 46 percent (3.3 $MtCO_2e$ in 2019) (DOEE 2022) of the District of Columbia's total annual GHG emissions.

Table 14: 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_2O/hr)	Emission rate (tonnes CO_2/yr)	Emission rate (tonnes CH_4/yr)	Emission rate (tonnes N_2O/yr)	TOTAL Emissions (tonnes CO_2e/yr)
Alt 2	2,138,215	2,662,868	115	3,405	112,391	13,487	0.2585	0.2473	20,828	0.40	0.38	**20,952**
Alt 3	1,661,220	3,642,855	133	3,694	130,144	15,617	0.2993	0.2863	26,168	.050	.048	**26,324**

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/ft^3) to calculate the hourly gas volume (ft^3/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 CO_2e/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 will be an estimated 58.2 MMBTU/hr excess capacity from the existing AFRH boilers that will 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/10^6 standard cubic foot) were obtained from the US EPA AP-42, Chapter 1 – External Combustion Sources, natural gas boilers. They are: 120,000 for CO_2, 2.3 for CH_4 and 2.2 for N_2O.

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 Alternatives 2 and 3 will 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 adverse 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 3.12 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 Air Quality

Air quality is regulated at the Federal level through the CAA and its amendments. The USEPA adopted the CAA in 1970 and its amendments in 1977 and 1990. Pursuant to the CAA, the USEPA has established National Ambient Air Quality Standards (NAAQS) for certain air pollutants (criteria pollutants) deemed harmful to public health and the environment. USEPA has set both primary and secondary standards. The primary standards protect public health including sensitive populations such as asthmatics, children, and the elderly. The secondary standards protect the public welfare, including protection against reduced visibility and damage to crops, animals, vegetation, and buildings. The criteria pollutants include nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), particulate matter ($PM_{2.5}$/PM_{10}), and lead (Pb). The standards are definted as pollutant concentrations such as parts per million (ppm), parts per billion (ppb), and micrograms per cubic meter of air ($\mu g/m^3$). The concentration standards for each of these criteria pollutants are presented in Table 15.

Table 15. National Ambient Air Quality Standards

Pollutant		Primary/Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm (10 mg/m^3)	Not to be exceeded more than once per year
			1 hour	35 ppm (40 mg/m^3)	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb (188 µg/m^3)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2) (100 µg/m^3)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	Annual Mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	Annual Mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4) (196 µg/m^3)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm (1300 µg/m^3)	Not to be exceeded more than once per year

Source: National Ambient Air Quality Standards Table

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

The Washington DC-MD-VA Region, which includes the AFRH-W, is designated as a marginal nonattainment area for O_3 (area has a design value of 0.071 ppm up to, but not including 0.081 ppm) under the 2015 8-hour standard (EPA 2015). The Washington DC-MD-VA region is designated as in attainment of the NAAQS for all other criteria pollutants. In 2019, the region was redesignated by the USEPA regarding the 2008 8-hr ozone standard from marginal nonattainment to attainment maintenance (EPA 2021). While the area still has ozone issues, precursor emissions such as volatile organic compounds, nitrogen oxides, and particulate matter are reducing; therefore ozone concentrations are slowly declining. The District's *Ambient Air Quality Trends Reports* illustrates these trends (DOEE 2020).

DOEE operates four air quality monitoring sites throughout the District. These monitoring sites measure ground-level concentrations of criteria pollutants, and pollutant concentrations from monitoring sites is available from USEPA's AirData website (USEPA 2022). The closest air monitoring station to the study area is located 1.3 miles south of the AFRH-W campus. Ambient O_3 and CO data recorded from this monitoring station from 2019 to 2021 are presented in Table 16 below. Exceedances of the O_3 8-hour standard were reported during each year – four times in 2019, and six times in 2021. It should be noted that the NAAQS is the 4th high 8-hr averaged over three years. No exceedances of any CO NAAQS were recorded during the same timeframe.

Table 16. Ambient Air Quality Data for O_3 and CO, 2019-2021 (AQS Site 11-001-0043, McMillan NCore-PAMS, 2500 1st Street, NW)

Pollutant	Averaging Time	Form	2019	2020	2021
Ozone (O_3) [ppm]	8-hour	First Highest	0.076	0.068	0.082
		Second Highest	0.073	0.066	0.074
		Third Highest	0.072	0.065	0.073
		Fourth Highest	0.071	0.063	0.072
		# of Exceedances	4	0	6
		Average Fourth High	0.069		
Carbon Monoxide (CO) [ppm]	1-Hour	First Highest	1.984	2.007	1.732
		Second Highest	1.818	1.951	1.654
		Third Highest	1.777	1.861	1.617
		Fourth Highest	1.773	1.768	1.549
		# of Exceedances	0	0	0
		Second Highest, Not to be exceeded	1.818		
Carbon Monoxide (CO) [ppm]	8-Hour	First Highest	1.500	1.600	1.600
		Second Highest	1.500	1.600	1.600
		Third Highest	1.500	1.600	1.500
		Fourth Highest	1.500	1.600	1.500
		# of Exceedances	0	0	0
		Second Highest, Not be exceeded	1.500		

Source: USEPA AirData, AQS Site ID 11-001-0043, Interactive Map of Air Quality Monitors

Section 176(c) of the CAA prohibits Federal entities from taking actions in non-attainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. In November 1993, the USEPA promulgated the General Conformity Regulations (58 FR 63214) to ensure that Federal actions: do not cause or contribute to new violations of the NAAQS, do not worsen existing violations of the NAAQS, and do not delay attainment of the NAAQS. The General Conformity regulations laid out in 40 CFR Part 93.153(b) ensure that all Federal actions not covered by the Clean Air Act's Transportation Conformity regulations conform to the State Implementation Plan (SIP) for achieving the NAAQS.

As previously mentioned, the AFRH-W is located in the heart of Washington, D.C. which is designated as Marginal Nonattainment for the 2015 8-Hour Ozone NAAQS. Previously, the area was designated as a Maintenance Area under the 1971 CO NAAQS, the now-revoked 1997 fine particulate ($PM_{2.5}$) NAAQS, and the 2008 Ozone NAAQS. Lastly, the area was classified as maintenance under the now-revoked 1997 Ozone NAAQS. Table 17 includes a summary of current and past Nonattainment and Maintenance designations. The analysis is summarized from the Air Quality Technical Report.

Table 17. Summary of Nonattainment and Maintenance Designations for the Project Area.

National Ambient Air Quality Standard (NAAQS) District of Columbia	Status Description for Project Area[1]
1971 Carbon Monoxide	Redesignated to "in Maintenance" on March 15, 1996.
1997 PM2.5 (Now-revoked)	Redesignated to "in Maintenance" on November 5, 2014.
1979 1-Hour Ozone (Now-revoked)	Designated as "Severe Nonattainment" until revocation of the Standard in 2004.
1997 8-Hour Ozone (Now-revoked)	Designated as "Moderate Nonattainment" in 2004; Standard revoked on April 6, 2015.
2008 8-Hour Ozone	Redesignated as "Marginal Nonattainment" on August 15, 2019.
2015 8-Hour Ozone	This Standard replaced the 2008 Standard and the area was Designated as "Marginal Nonattainment" in 2018.

[1] EPA Greenbook – District of Columbia, retrieved in March 2022 from online portal: https://www3.epa.gov/airquality/greenbook/anayo_dc.html.

3.6.1 Impacts to Air Quality

3.6.1.1 Alternative 1: No Action Alternative

Under the No Action Alternative, no new facilities will be constructed. Air quality analyses for both mobile and stationary sources were conducted. Existing traffic conditions in the area have resulting moderate, long-term, adverse impacts to air quality. The No Action Alternative will not add to the impacts and will conform to the *Washington Metropolitan Region SIP.*

3.6.1.2 Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2

New development associated with the AFRH-W Master Plan and its Amendments has the potential to affect air quality in four ways:

- Increased emissions from current stationary sources of pollutants such as generators and boilers throughout the AFRH-W;
- Minimal emission estimates for building natural gas heating units.
- Increased vehicular traffic to the site, which raises vehicle emission levels near the site, and possibly in the region; and
- Generation of airborne dust during construction.

For this analysis, the emission inventories of mobile and stationary sources for each alternative were evaluated for conformity with the Washington Metropolitan Region SIP. The Master Plan and its Alternatives will affect air quality in the area on a very small scale. Fugitive dust will be produced during construction, but it will be minimal and not permanent. Fugitive dust will be generated during site grading, construction, wind erosion, and vehicular activities. Emissions from construction equipment including earth-moving equipment, demolition equipment, and paving equipment, will generate criteria pollutants and hazardous pollutants. The intensity, duration, location, and type of construction activity will vary over time, which will result in minor, short-term, adverse impacts. These impacts will be mitigated using BMPs outlined in the District's regulations during construction, ensuring that there will be minimal temporary construction-related adverse impacts.

General Conformity Analysis

To demonstrate General Conformity with all relevant NAAQS, direct and indirect emissions were estimated for CO, $PM_{2.5/10}$, NO_x and VOC using EPA's MOVES3.0.3 emissions model and compared to published allowable emission rates defined in 40 CFR 93.153(b)(1) and 93.153(b)(2). During construction and pre-construction, direct emissions include:

- Construction equipment tailpipe emissions for each alternative examined, and
- Fugitive particulate emissions from earth-moving activities.

Once construction is completed and regular operations at the site commence, direct emissions will be sourced from:

- Emergency generator(s); and
- Natural gas-fired space heaters.

Indirect emissions for each alternative include on-road emissions of $PM_{2.5/10}$, CO, NO_x, and VOC sourced from:

- On-road commuter tailpipe emissions sourced from construction workers traveling to and from the site each workday during construction; and
- On-road commuter tailpipe emissions sourced from facility staff once construction has been completed and the AFRH-W is once again being used for regular operations.

Table 18 includes pre-project direct and indirect emissions from construction activities and emissions, both direct and indirect, resulting from the completed project during 2021, 2028, 2032, and the 2037 estimated buildout year. Therefore, the conformity analysis demonstrates general conformity with the emission limits set forth under CAA Section 176(C).

Table 18. Demonstration of General Conformity during and after the Construction Phase

Pollutant of Interest	$PM_{2.5/10}$	VOC	NOx	CO
Emission Limit for General Conformity in Other Ozone NAAs inside Ozone Transport Region[1] (tpy)	100	50	100	100
Construction and Worker Emissions, All Phases for Alternative 2	18.11	0.15	2.19	1.18
Construction and Worker Emissions, All Phases for Alternative 3 (Amendment 2)	18.11	0.15	2.19	1.18
Post- Construction Project Emissions for Selected Alternative 3 (Amendment 2) in 2028 (tpy)	29.27	1.37	29.27	21.42
Post- Construction Project Emissions for Selected Alternative 3 (Amendment 2) in 2032 (tpy)	29.27	1.37	29.27	21.42
Post- Construction Project Emissions for Selected Alternative 3 (Amendment 2) in 2037 (tpy)	29.27	1.33	29.27	21.18

[1]The project area is currently located in an area designated as Marginal Nonattainment, therefore general conformity was demonstrated via comparison to the limits in 40 CFR 93.153(b)(1) and (2).

Mobile Source Analysis

In accordance with *USEPA Guidance on CO Hot Spot Analysis* (EPA 1992), the potential for mobile source emissions to violate the NAAQS was evaluated by analyzing mobile CO emissions at a single intersection considered to be the worst-case scenario for potential emissions on nearby air quality sensitive receptors. Within the project area, the levels of service were consistently lowest during all phases of each scenario examined at the intersection of North Capitol Street/ Hawaii Avenue & Allison Street. Due to the combination of low pre- and post-project levels of service throughout all phases and excessive delays, the North Capitol Street/ Hawaii Avenue & Allison Street intersection was selected for this quantitative CO hot spot analysis. The selection is a five-way intersection that has three approaches with two one-way legs of Allison Street exiting the intersection to the east and west. It can be reasonably assumed that if no violation of the CO NAAQS is predicted via dispersion modeling of the worst-case intersection within the project impact area, then no violation of the CO NAAQS will occur elsewhere within the project impact area.

The CAL3QHC modeling results indicate that the predicted maximum CO concentrations for the Alternatives 2 and 3 will result in no exceedances of the NAAQS for CO, which is 35 ppm for the 1-hour standard and 9.0 ppm for the 8-hour standard. Under the Action Alternatives examined, there will be no exceedances of the CO 1-hour and 8-hour NAAQS.

Stationary Source Analysis

Development of the AFRH-W under the Master Plan and its Amendments will increase air pollutant emissions and other on-site facilities to accommodate projected demands. These include several engines permitted by the AFRH-W Title V Air Permit Number 017-R3-A1, which was issued on September 9, 2021. All generators are used for backup power and are assumed to operate no more than 100 hours/year each. All permitted generators range in age from model/manufacture year 1998 to 2018 and were all installed within one year of the date of manufacture.

Proposed new air emission sources are the expected natural gas usage for heating in the newly constructed buildings and the worst-case construction related fugitive dust emissions for Alternatives 2 and 3. Table 19 below outlines the total emissions of existing site conditions and Alternatives 2 and 3. It should also be noted that dispersion modeling of the proposed stationary sources was not conducted because the new natural gas heaters emissions are minimal and are not expected to cause a NAAQS exceedance. Therefore, there will be minor, long-term, adverse impacts from anticipated stationary sources.

Table 19. Stationary Source Emissions

Pollutants	Existing Conditions 2021 Ton/yr*	Alternative 2 Ton/yr**	Alternative 3 (Preferred) Ton/yr
NO_x	23.2	82.79	14.35
VOC	1.28	4.55	0.59
$PM_{2.5/10}$	1.77	6.29	0.76
Fugitive $PM_{2.5}$	N/A	18.11	18.11
Fugitive PM_{10}	N/A	18.11	18.11
CO	19.51	69.54	75.26
SO_2	0.15	0.50	0.54
GHG	25,122	89,520	96,877

* Note that the greenhouse gas value is in metric tons per year.
** The total natural fuel consumption is based on the assumed square footage for each alternative. This provides a conservative, worst case scenario, the heaters are assumed to operate during three seasons i.e. nine months per year. Fugitive construction emissions are based on the worst case disturbed area of 77.0 acres and 75% control via water sprays.

New Source Review Applicability

The purpose of New Source Review (NSR) Analysis is to determine whether Alternatives 2 or 3 will be considered a new source of emissions. As illustrated above, the expected maximum heat rating of *all* potential heaters combined will be approximately 77.28 MMBtu/hr. Therefore, 40 CFR Part 60, Subpart Db does not apply because units of greater than 100 MMBtu/hr are subject to the NSR. Secondly, the likelihood of one unit being greater than 10 MMBtu/hr is very minimal because there will be dozens of buildings constructed during each phase of the project. Therefore, it is expected that none of the proposed heaters will be greater than 10 MMBtu/hr. As a result, Subpart Dc is not applicable either.

It should be noted that all current and proposed generators are subject to 40 CFR Part 60, Subpart IIII or 40 CFR Part 63, Subpart ZZZZ, where applicable. Detailed descriptions of emergency and non-emergency generators that are included in AFRH-W Title V Permit 017-R3-A1 are provided in Table 20.

Table 20 Significant Emission Units included in AFRH-W Title V Air Permit 017-R3-A1

Emission Unit ID	Stack ID	Emission Unit Name	Description	Applicable Regulations
B5	BB5	Building – Sheridan	500 kWe Katolight emergency generator set powered by a 750 hp diesel-fired engine, Model D500FRX4 (manf. Dec. 1998, inst. 1999)	40 CFR 63 Subpart ZZZZ, DCMR 500.2
B13	BB13	Scott Generator #1	725 kWe emergency generator set powered by an 895 kWm/1200 hp natural gas-fired engine (manf. June 2012, inst. 2013)	40 CFR 60 Subpart JJJJ, 20 DCMR 201
B14	BB14	Scott Generator #2	725 kWe emergency generator set powered by an 895 kWm/1200 hp natural gas-fired engine (manf. June 2012, inst. 2013)	40 CFR 60 Subpart JJJJ, 20 DCMR 201
B15	B15	Eagle Gate	10 kWe emergency generator set powered by a 15 hp natural gas-fired engine (inst. 2018)	40 CFR 60 Subpart JJJJ, DCMR: 201, 501, 502.1, 606.1, 903.1, 805.1,
B11	BB11	Building – Sherman	50 kWe Kohler emergency generator set powered by an 80 kWm/107 hp diesel-fired engine, Model 50RE0ZJC (manf. Nov 2001, inst. 2007)	40 CFR 63 Subpart ZZZZ, DCMR 500.2
B12	BB12	Building - Security	25 kWe Katolight emergency generator set powered by a 45 kWm/60 hp diesel-fired engine, Model D25FPP4 (manf. July 1997, inst. 1997)	40 CFR 63 Subpart ZZZZ, DCMR 500.2
C24	-	-	One 300-gallon gasoline storage tank subject to Stage I vapor recovery requirements	40 CFR 63 CCCCCC, 20 DCMR: 201, 704 and 1408.1

3.7 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 will 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, 2016, and 2021. NCPC updated the Federal Elements of the Comprehensive Plan in 2016.

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.
- Visitors and Commemoration: While the Comprehensive Plan acknowledges the important role that the city's Monumental Core plays in attracting and educating visitors to the Nation's Capital, the plan also turns attention to the "opportunities to enhance the visitor experience beyond te traditional hallmarks of a visitor's stay in Washington." The Lincoln Cottage is specifically mentioned in the Comprehensive Plan as one of the important sites that provides a destination off the monumental core.

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 on-site 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 8). 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 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 will 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 25-acre former McMillan Reservoir Sand Filtration Site, located at North Capitol Street and Michigan Avenue, NW, is to be redeveloped into a mixed-use project that shall include historic preservation, open space, residential, retail, office, and hotel uses..

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

Zoning – AFRH-W is currently not subject to District zoning regulations (see Figure 9. 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 will be created to allow matter-of-right development of the Master Plan for the Development Zone. The MOU was updated on July 27, 2020.

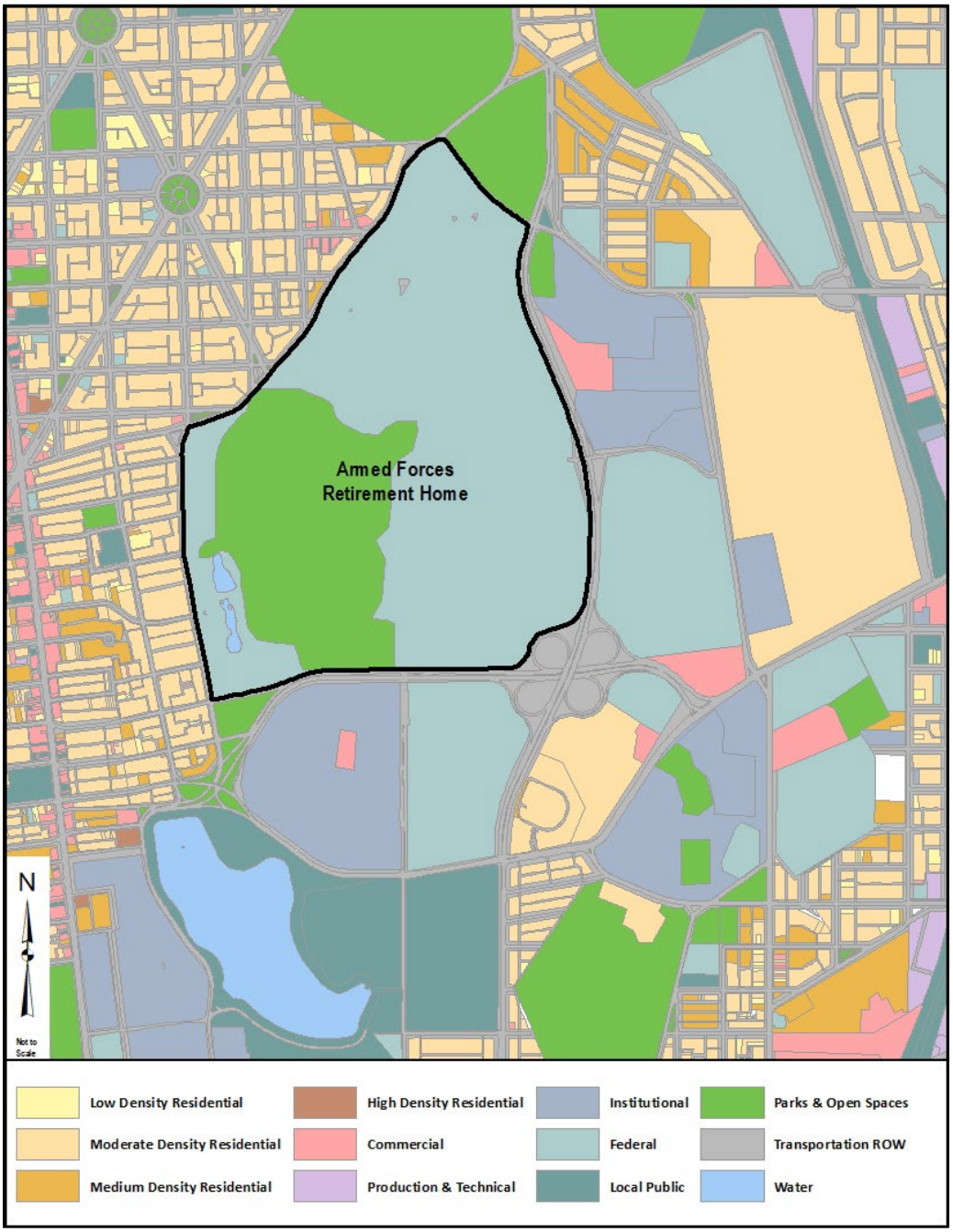

Figure 8: Existing Land Use (DCOP 2017)

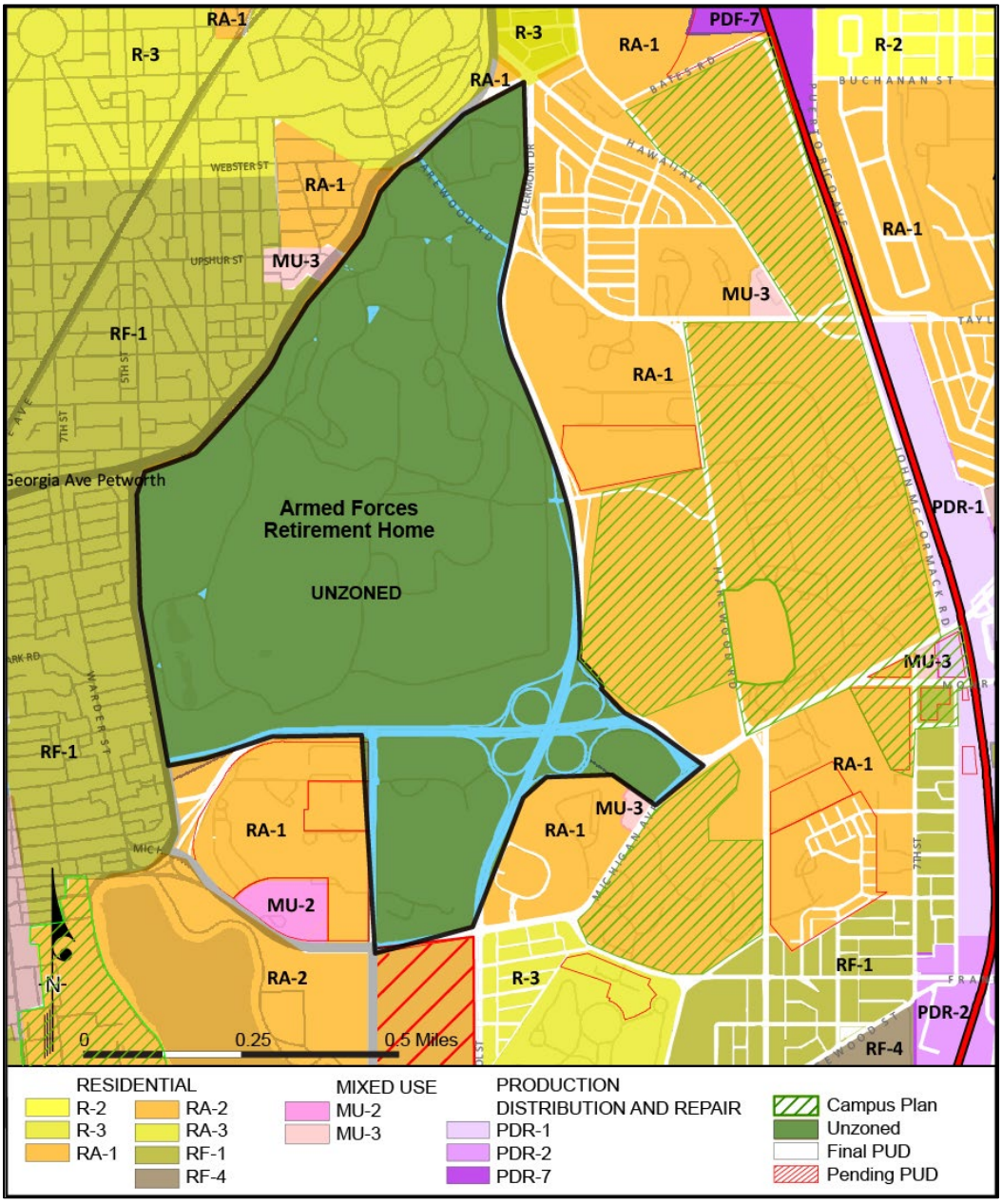

Figure 9: Zoning (DCOZ 2017a)

3.7.1 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.

3.7.1.1 Alternative 1: No Action Alternative

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

3.7.1.2 Alternative 2: Master Plan Amendment 1 and Master Plan Amendment 3

Compatibility of the Master Plan Amendments 1 and 2 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 the AFRH campus will alter the natural and built environment. The Master Plan will result in the use of natural resources as described in the Final EIS and Supplemental EIS, which states that the AFRH and the selected developer will develop the site in a manner that "provides a setting that benefits the local community, provides a model for the country, and is worthy of the nation's capital." Because it will generate revenue for AFRH, development pursuant to the Master Plan will help to ensure AFRH can continue to fulfill its mission of housing and caring for retired enlisted military personnel. Alternatives 2 and 3 will be consistent with the Federal Environment Element of the Comprehensive Plan.
- **Federal Workplace:** Consistent with this element, the Master Plan accommodates the consolidation of federal operations at AFRH-W, reducing the agency's footprint. However, maintaining the entirety of the campus as both AFRH's home and as a federal property is important to preserving the legacy of this historic institution. The Master Plan, therefore, allows AFRH to leverage its underutilized land and facilities through a ground lease to introduce new uses that are beneficial to the federal workforce at AFRH-W, to the residents that call AFRH-W home, and to the communities that surround the campus.
- The Comprehensive Plan also calls for Federal Workplaces to include uses "that will be valuable to the community." The Master Plan includes publicly accessible open space, shopping, dining, hotel, and residential uses that will be valuable to the community. In addition, the Master Plan calls for a pedestrian-friendly environment and an extensive network of bicycle paths connecting to adjacent

neighborhoods. Alternatives 2 and 3 will be consistent with the Federal Workplace Element of the Comprehensive Plan.

- **Urban Design:** The Master Plan will conserve and enhance the park and open space network 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. Within Zone A, there will be open space created and/or maintained, much of which will be open to the public. Currently, the entire site is secure and not open to the general public.
  Situated at one of Washington's "Capital Gateways" and at the northern terminus of a major axial street (North Capitol Street), the development of Zone A will play an important role in marking one of the significant entry points to the monumental core. AFRH-W also has a significant location on the "topographic bowl," where views to and from the campus are significant to the character of the city. The Master Plan uses strategic placement of new construction and detailed design guidelines to ensure that new development at AFRH-W honors these important planning considerations for the Nation's Capital. Alternatives 2 and 3 will be consistent with the Urban Design Element of the Comprehensive Plan.
- **Historic Preservation:** The development of the site could potentially result in adverse effects to the historic character of the site. AFRH has executed a Programmatic Agreement with the NCPC, DC State Historic Preservation Office (DCSHPO), Advisory Council on Historic Preservation (ACHP), and the U.S. National Park Service that enumerates the measures which will be undertaken to avoid, minimize, or mitigate potential adverse effects. Consulting parties to the Section 106 process of the NHPA helped to identify potential adverse effects and advise on avoiding or mitigating such effects. Consulting parties include: ACHP; DCSHPO; NCPC; the National Park Service; the National Trust for Historic Preservation; the NCPC; the District of Columbia Office of Planning (DCOP); the U.S. Commission of Fine Arts; the Committee of 100 on the Federal City; the District of Columbia Preservation League; Advisory Neighborhood Commissions (ANC) 1A, 4C, 5A, and 5E; the Rock Creek Cemetery Association; President Lincoln's Cottage; St. Paul's Episcopal Church; the Military Officers Association of America; Friends of the Soldiers' Home; ; the US Army (via Arlington National Cemetery); CUA; and Council Members for Wards 1, 4 and 5. Alternatives 2 and 3 will be consistent with the Historic Preservation Element of the Comprehensive Plan.
- **Transportation:** NCPC's Master Plan Guidance sets a standard that "a Transportation Management Plan (TMP) is required for any project that will increase employment on a work site to 500 or more employees (existing and new). TMPs are strongly encouraged for projects that will increase employment to 100 or more employees." AFRH currently has approximately 300 employees on campus. The employees work in 3 shifts, with the first shift having the largest number of workers (221 workers). These workers are comprised of a mix of medical, food service, security and maintenance workers, and a small number of office workers. Thus, AFRH-W differs from most federal facilities in that a majority of its employees are not office workers. Due to the nature of the jobs, most of the AFRH employees do not have much flexibility in working schedules and do not

have the option of telecommuting. Furthermore, approximately 11 percent of the employees are already taking advantage of the SmarTrip benefit program and are most likely using transit to travel to/from work.

AFRH has provided information to NCPC on its employee count and employees' commuting patterns to demonstrate that AFRH-W does not meet the threshold requirements for preparing a TMP for its operations. AFRH will comply with NCPC parking ratios for any new construction on the AFRH portion of the campus that affect AFRH employees.

AFRH will require developers to prepare and implement TMPs for their projects.

- **Visitors and Commemoration:** Although AFRH-W is currently not open to the general public, AFRH has a long-standing partnership with the President Lincoln's Cottage, a 501(c))3 that operates a heritage tourism destination focused on President Abraham Lincoln's legacy and his relationship to the Lincoln Cottage (Building 42) and grounds are AFRH-W. The Master Plan accommodates the continued stewardship of Lincoln Cottage, and the private development proposed for Zone A will attract new attention and visitors to this less-known landmark. Amenities in Zone A and transit enhancements that may result from the development of Zone A and other surrounding areas could improve the visitor experience.

District of Columbia Elements

- **Land Use Element:** The Master Plan and its Amendments will address the Land Use Goal (302) and anticipates future planning analysis related to the North Capitol Crossroads. It will also accommodate neighborhood and historic "character," reflecting the sense of place as defined by architecture, visual landmarks and view sheds, streets, public spaces, and historic buildings and landmarks. The Master Plan and its Amendments will support several of the Comprehensive Plan's related policies, such as the reuse of large, publicly-owned sites; integration of the new development into the urban fabric; and the protection of existing assets on large sites.
- **Transportation Element:** A Transportation Management Plan will be developed under Alternatives 2 or 3 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. Alternatives 2 and 3 will be consistent with the District's Transportation Element of the Comprehensive Plan.
- **Housing Element:** The development of AFRH-W will include creation of new residential and assisted living housing opportunities that will be available to a range of District residents. Therefore, the Master Plan and its Amendments will be consistent with the District's Housing Element of the Comprehensive Plan.
- **Environmental Protection Element:** Development on AFRH-W will alter the natural and built environmental. The Master Plan and its Amendments will result in the use of natural resources and the site will be developed in a sustainable manner in order to protect the natural environment and

minimize energy use to the extent possible. Therefore, the Master Plan and its Amendments will be consistent with the District's Environmental Protection Element of the Comprehensive Plan.

- **Economic Development Element:** The Master Plan and its Amendments will include retail/commercial development, providing additional jobs compatible with this element of the Comprehensive Plan.
- **Parks, Recreation, and Open Space Element:** The Master Plan and its Amendments will conserve and enhance the park and open space system of the National Capitol Region, ensure that adequate resources are available for future generations, and promote an appropriate balance between open space resources and the built environment. Within Zone A, there will be open space created and/or maintained, much of which will be open to the public. Currently the entire site is secure and not open to the public. Therefore, the Master Plan and its Amendments will be consistent with this element of the Comprehensive Plan.
- **Urban Design Element:** The implementation of the Master Plan and its Amendments will ensure that the development of the Home will "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 in the Master Plan and its Amendments. AFRH Partners will be required to follow these guidelines. Therefore, the Master Plan and its Amendments will be consistent with the District's Urban Design Element.
- **Historic Preservation Element:** The development of the site will result in adverse effects to the historic character of the site. Through the NHPA Section 106 consultation, AFRH has taken steps to avoid, minimize and mitigate adverse effects. This includes the guidelines in the Master Plan and its Amendments and mitigation commitments made in this Final SEIS and the Programmatic Agreement. AFRH has executed a Programmatic Agreement with the DC State Historic Preservation Office, Advisory Council on Historic Preservation, and the National Park Service which enumerates the measures to potential adverse effects. Consulting parties to the Section 106 process of the NHPA helped to identify potential adverse effects and advise on avoiding or mitigating such effects.
- **Community Services and Facilities Element:** The Plan and its Amendments include development intended for medical facilities and assisted living homes for senior citizens. Additionally, the development will be connected to its surrounding neighborhoods so residents will have access to local community amenities and emergency services. Development in Zone A includes retail and hotel amenities that will be available for use by AFRH-W and the surrounding areas. The Master Plan and its Amendments will be consistent with the Community Services and Facilities Element of the District's Comprehensive Plan.
- **Infrastructure Element**: Development on AFRH-W will tie into existing utilities. The new development will increase the amount of impervious area on the site. Impacts to stormwater management are discussed in Section 3.4 of this Final SEIS. BMPs will be used to reduce runoff and

erosion during storm events. The Master Plan and its Amendments will be consistent with the Infrastructure Element of the District's Comprehensive Plan.

District of Columbia Area Elements

- **Rock Creek East Planning Area:** The Master Plan and its Amendments will consult this area element of the Comprehensive Plan for policies and actions on the reuse of a portion of the AFRH site, since the development will affect transportation, infrastructure, and services in this and surrounding planning areas. The Master Plan will work to strengthen functional and perceptual intersections with the District through improved multi-modal connectivity, publicly accessible green space, adaptive reuse of historic assets into new amenities, and new housing options to meet Washington, DC's growing demand. The Master Plan and its Amendments will preserve, enhance, and integrate with the established neighborhoods for which the area is known and will retain the open space, mature trees, and visual buffers that are welcomed in the community. Therefore, the Master Plan and its Amendments will be consistent with the Rock Creek East Planning Area Element.

Project Area Land Use and Zoning

Implementation of Master Plan Amendments 1 and 2 will result in a substantial change to the physical character of certain portions of the site. Implementation of te Master Plan and its Amendments will result in a change from open space and industrial buildings to the uses outlined for each zone.

Development in the AFRH Zone will be institutional, cultural, and residential. While development in Zone A will be developed with residential, office, medical, retail, and hospitality uses. This development will replace AFRH-W facilities located along North Capital Street. All development at AFRH-W will replace open and forested space. The DC Future Land Use Map also permits a 3-acre area at the north end of Zone A to be developed with a combination of residential, commercial, and production, distribution, and repair uses, taking advantage of the aesthetics, placement, and scale of the historic Heating Plant. These changes will be compatible with surrounding land uses.

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 will be compatible with surrounding land uses.

AFRH-W is currently not subject to District zoning regulations; however responding to NCPC's Action of February 2, 2006, which requested that AFRH reach an agreement with DC regarding responsibilities for building code review, zoning, compliance and permitting; AFRH, DCOP, and NCPC entered into a Memorandum of Understanding (MOU) and Statement of Land Use Review Process whereby the parties established a hybrid process for project review of the portions of the Master Plan that are developed by the private sector. The same parties renegotiated and executed a new MOU in July 2020, that maintains the hybrid review process established in 2005 and better defines the relationship between the AFRH-W Master Plan and the DC Comprehensive Plan. In concert with this, AFRH collaborated with NCPC and DCOP on the new DC Comprehensive Plan, approved by the DC Council in May 2021, to ensure Zone A's inclusion in the Generalized Policy Map, the Future Land Use Map, and the Rock Creek East Planning

Area. The approved Master Plan (including approved amendments) 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 will 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.

3.8 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 will impact the local transportation network.

Principal Roadways

The project team 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 Rock Creek Church Road NW to the north, Michigan Avenue (NW and NE) to the south, Michigan Avenue NE to the east, and Park Place NW to the west. However, it also extends in three directions to include segments of the following major corridors that the proposed development will affect:

- Along North Capitol Street between Michigan Street NE/NW to Rock Creek Church Road NW,
- In the easterly direction along Irving Street NE to the intersection with Michigan Avenue NE, and
- In the westerly direction along Irving Street NW to the intersection with Park Place NW.

The main roadways in the vicinity of AFRH-W are shown in Figure 10 and listed with their defining characteristics in Table 21 below.

Figure 10: Armed Forces Retirement Home Master Plan TIS Study Area

Table 21: Study Area Major Corridor Characteristics

Roadway	Functional Class	2019 AADT (1,000 vehicles)	Number of Lanes, Median	Speed Limit (mph)	Primary Truck Route/Designated Loading Zones?
North Capitol Street	Principal Arterial	41.8 - 43.6	5, None 6, Grass	25/30	Yes/No
Hawaii Avenue NE	Collector	6.4	2, None	25	No/No
Rock Creek Church Road NW	Collector	4.3	3, None	25	No/No
Harewood Drive NW	Collector	5.8	2, One Way, None	25	No/No
Fort Drive NE	Minor Arterial	8.5	4, None	25	No/No
Scale Gate Road	Local	-	2, None	25	No/No
Irving Street (NW and NE)	Minor Arterial	24.2-25.7	6, Grass	25	Yes/No
Michigan Avenue (NW and NE)	Minor Arterial	22.0-21.7	4-6, None	25	Yes/No
First Street NW	Collector	6.8	4, Grass/Concrete	25	No/No
Park Place NW	Minor Arterial	6.9	1, None	25	No/No
Kenyon Street NW	Minor Arterial	10.1	1, None	25	No/No

Study Methodology

Due to the impacts of the COVID-19 pandemic on typical transportation volumes in 2020 and 2021, it was not possible to collect updated traffic volume data that will be representative of typical traffic conditions within the District. Therefore, the analysis utilizes data from a variety of existing sources, including:

- DDOT Traffic Engineering and Signals Division, which provided the following data:
  - 2019 peak hour turning movement count (TMC) volumes for the following intersections:
    - Park Place NW and Kenyon Street NW
    - Park Place NW and Irving Street NW
    - Irving Street NW and Hobart Place NW
    - Michigan Avenue NW and First Street NW
    - North Capitol Street and Michigan Avenue NE/NW
  - 2016 peak hour TMC volumes for the following intersections:
    - North Capitol Street/Hawaii Avenue NE and Rock Creek Church Road NW
    - North Capitol Street/Hawaii Avenue NE and Allison Street NE
    - North Capitol Street and Harewood Road NW/Fort Drive NE
- 2017 Michigan and Irving Development Comprehensive Transportation Review, which contained TMC volumes collected in 2016 at the following intersection:
  - Irving Street NE and Michigan Avenue NE

- 2017 AFRH Comprehensive Transportation Review, which contained TMC volumes collected in 2015 for the following intersections:
    - Scale Gate Road and North Capitol Street SB Ramp NW
    - Scale Gate Road and North Capitol Street NB Ramp NE

It should be noted that if data is provided for the same study area intersection from multiple sources, the most recent pre-pandemic data was utilized. Annual growth rates were then applied to each of the volumes to establish estimated 2021 volumes. Capacity analyses were performed for the signalized and unsignalized intersections in the study area using Synchro 10 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 that is based on the methodologies contained in the Highway Capacity Manual (HCM). 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.

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 volume-to-capacity ratio greater than 1.0. Table 22 summarizes the HCM 6th Edition delay criteria for signalized and unsignalized intersections.

Table 22: LOS Criteria for Signalized Intersections

Level of Surface	Average Control Delay (seconds/vehicle) Signalized	Average Control Delay (seconds/vehicle) 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: Highway Capacity Manual 6th Edition

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.

2021 Existing Conditions

2021 Existing Condition volumes for the AM and PM peak hours were modeled in Synchro 10 to produce capacity analysis results. The results are shown in Table 23.

Table 23: 2021 Existing Condition LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Buchanan St NE	C (32.8)	A (4.1)
North Capitol St & Rock Creek Church Rd NW	A (9.8)	A (9.1)
North Capitol St/Hawaii Ave NE & Allison St NE/NW	F (91.5)	F (147.7)
North Capitol St & Harewood Rd NW/Fort Drive NE	C (28.7)	F (76.8)
SB North Capitol St Ramp & Scale Gate Rd	A (3.1)	A (0.5)
NB North Capitol St Ramp & Scale Gate Rd	A (8.8)	A (8.5)
First St NW & Irving St NW	C (28.1)	C (23.7)
North Capitol St & Michigan Ave NE/NW	D (338.3)	F (53.0)
Michigan Ave NE & Irving St NE	C (30.3)	C (25.8)
Hobart Pl NW & Irving St NW	C (24.7)	C (26.1)
Irving St NW & Ramp from SB North Capitol St	A (6.5)	A (2.2)
Park Pl NW & Kenyon St NW	F (95.9)	C (28.6)
Park Pl NW & Irving St NW	A (8.1)	A (8.3)
First St NW & Michigan Ave NW	C (32.8)	D (37.5)

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. Other intercity systems include 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 24 and Figure 11). 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 an acceptable walking distance of the site. Furthermore, a walking distance of 0.5 miles is considered acceptable for a high-frequency rail service, like Metrorail. However, the AFRH-W site is located approximately 1 mile from the Brookland-CUA Metrorail Station (Red Line) and approximately 1.2 miles from the Columbia Heights Metrorail Station (Green/Yellow Lines). Thus, the site is considered to be outside the acceptable walking distance for high-frequency rail transit.

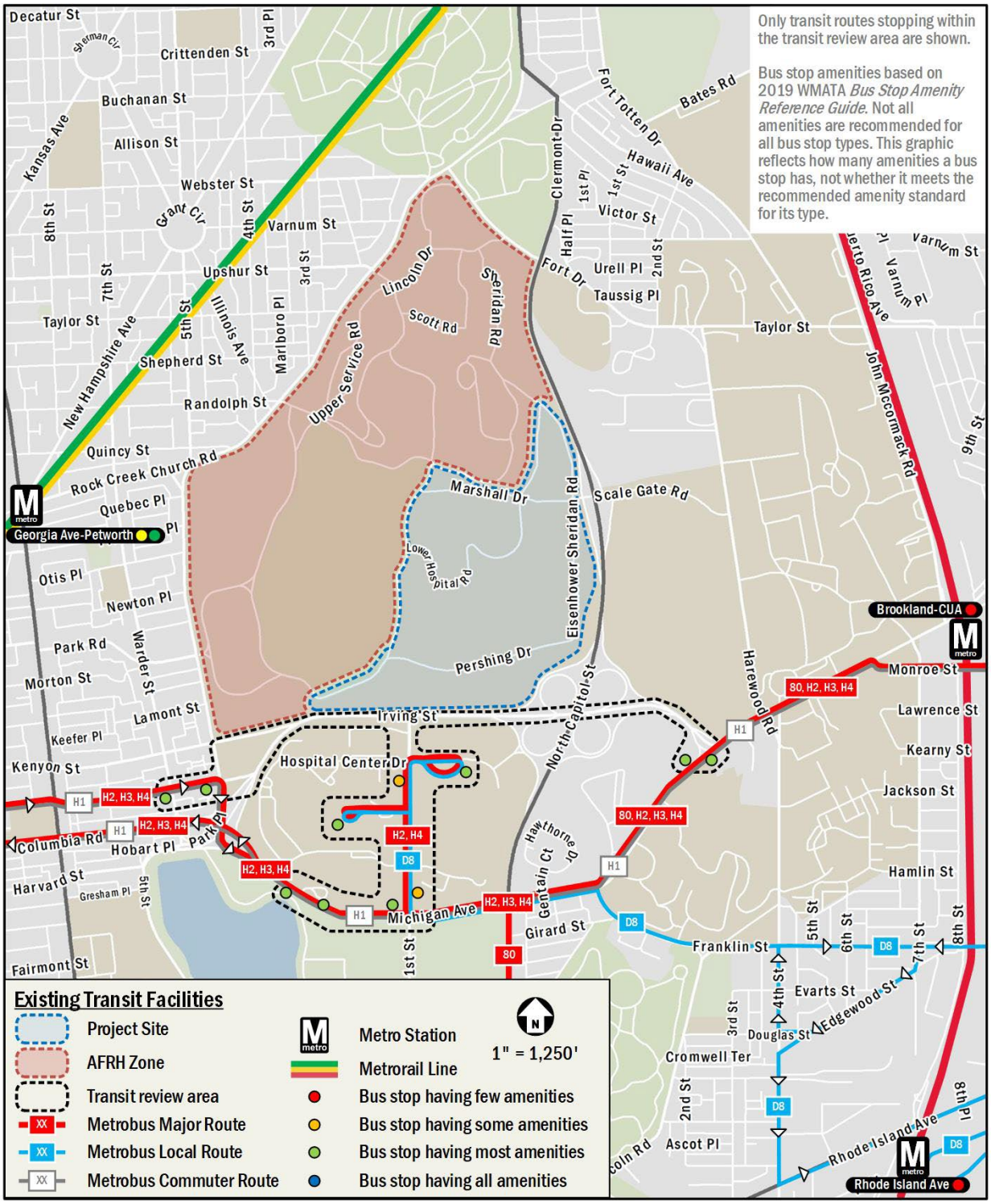

Figure 11: Metrobus and Metrorail Service in the Vicinity of AFRH-W

Table 24: 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 (Table 25). 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).

  The results of the capacity analysis indicate that the majority of the routes are at or above capacity (see Table 25). 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 was determined that Routes 80 and D8 operate above the accepted R/C ratios during the PM peak hour.

Table 25: 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

- **Metrorail –** Despite the distance between the AFRH-W site and the closest Metrorail stations, it is anticipated that a significant number of people living at or visiting the site will want to travel utilizing Metrorail via potential future last-mile transit connections. 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 will be most utilized for site Metrorail trips. 2015 daily weekday passenger boarding data was obtained from WMATA for those stations. WMATA's Metrorail 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.

  Metrorail 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 8,640 passengers during each AM and PM peak hour. It should be noted that eight car trains operate on both lines as well, which will 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 8,640 passengers, the Brookland-CUA and Columbia Heights stations do not currently experience capacity issues under typical pre-pandemic weekday conditions.

- Commuter Rail - Commuter train service is available into the District from the MARC, 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 modes are not considered in this study.

Pedestrian and Bike Facilities

Pedestrian facilities within a quarter mile of the site were evaluated, as well as walking routes to the Brookland-CUA and Columbia Heights Metrorail stations. The existing development site has extremely limited pedestrian infrastructure as measured by DDOT standards. Except for limited sidewalks adjacent to surface parking lots at the northern end of the project site, there are no other existing sidewalks on or directly adjacent to the site.

A review of pedestrian facilities surrounding the proposed development shows that, while there is a sufficient pedestrian network connecting the adjacent area south of the site to the Brookland-CUA and Columbia Heights Metrorail stations, there is no existing connectivity along the southern perimeter of the project site on the north side of Irving Street NW. Many other facilities within the vicinity of the site do not currently meet DDOT standards, being of insufficient width according to their street typology and corresponding minimum width based on ZR16 designations. A detailed inventory of the existing pedestrian facilities within the study area is shown on Figure 12 and Figure 13. Sidewalks, crosswalks, and curb ramps were evaluated based on the guidelines set forth by DDOT's Design and Engineering Manual (2019) in addition to Americans with Disabilities Act (ADA) standards.

Within the study area, most roadways fall within a low to moderate density residential and high density residential or light commercial zone based on ZR16 designations. Due to the project site's location on federally controlled property and adjacent to major roadways, many roadways are currently not zoned and being considered as high density or light commercial for the purposes of this study. Nearly all on-site roadways do not have sidewalks or crosswalks, and although many sidewalks surrounding the site are navigable, they do not comply with DDOT standards. Additionally, there are notable gaps in the pedestrian network that impact the quality and attractiveness of walking including along the north side of Kenyon Street NW and Irving Street between Park Place NW and Michigan Avenue NW as well as the east side of Park Place NW. For the most part, the sidewalks in the study area that do not meet DDOT standards for their street type have between four and five feet of unobstructed clear width.

ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning surface. Additionally, curb ramps shared between two crosswalks are not desired but where they are present, a 48" clear space is required outside active vehicle traffic lanes and within marked crossings. As shown in Figure 12 and Figure 13, most of the existing curb ramps near the site meet ADA standards; however, some intersections lack a crosswalk and curb ramp on one leg or have curb ramps lacking detectable warning surfaces. Additionally, several crosswalks within the

Washington Hospital Center and VA Medical Center campus have curb ramps that are missing detectable warning surfaces or lack curb ramps altogether.

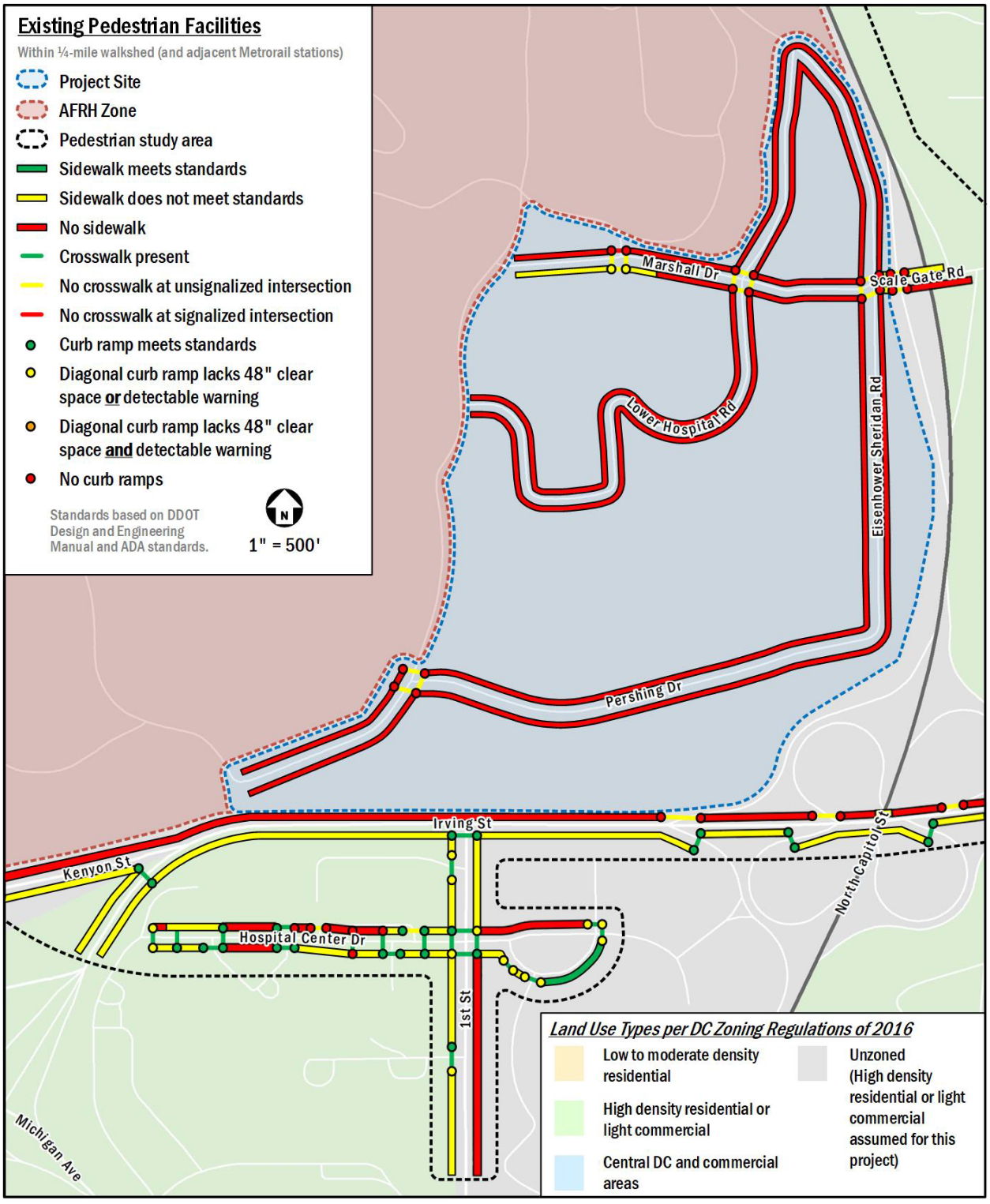

Figure 12: Existing Pedestrian Facilities Adjacent to the AFRH-W Site

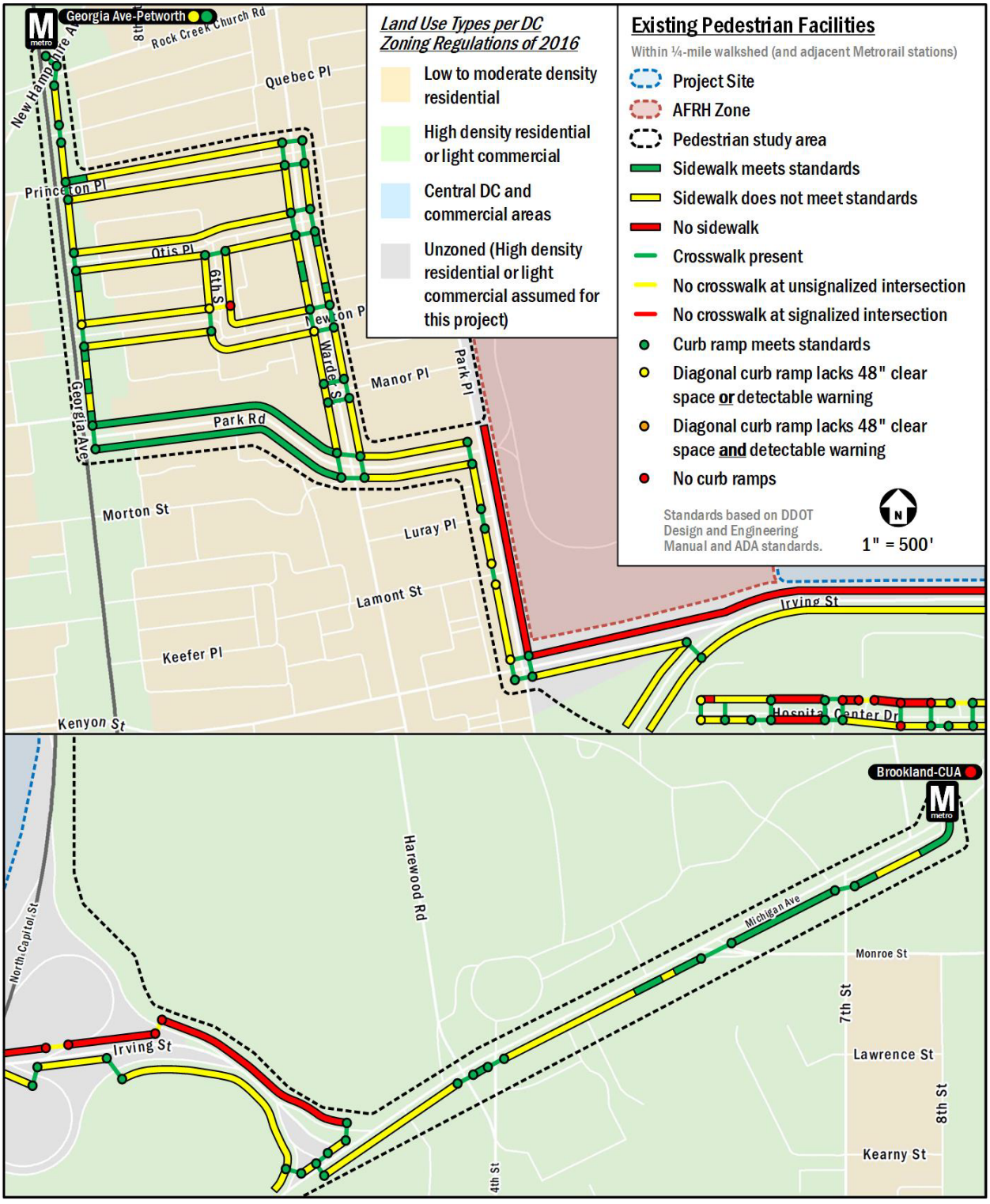

Figure 13: Existing Pedestrian Facilities External to the AFRH-W Site

The site has access to existing on- and off-street bicycle facilities. The development is located directly adjacent to the Crosstown Protected Bike Lanes on Irving and Kenyon Streets NW, which can be used to access the bicycle lanes on Park Place NW and Warder Street NW as well as the Michigan Avenue NE off-street trail connection to bike lanes north along Harewood Road NE and protected bike lanes south along 4th Street NE. Additionally, the Metropolitan Branch Trail is located approximately 0.4 miles east along Michigan Avenue NE which provides connections to Union Station and far Northeast DC. Figure 14 illustrates existing bicycle facilities in the area. No short-term bicycle parking is provided along the perimeter of the site under existing conditions.

Capital Bikeshare

In addition to personal bicycles, the Capital Bikeshare program provides additional cycle options for residents, employees, and patrons of the AFRH-W redevelopment. The program has placed over 500 bikeshare stations across the Washington metropolitan area with over 4,500 bicycles in the fleet. One Capital Bikeshare station is within a quarter mile of the site:

- A 15-dock station at 1st & Washington Hospital Center NW, 0.2 miles from the site

Figure 14 illustrates these and other Capital Bikeshare locations in the area.

Micromobility

As of August 2021, micromobility services in the District are provided by eight private dockless companies operating electric-assist bicycles (e-bikes) and electric scooters (e-scooters). These include two companies operating e-bikes (HelBiz and Jump) and six companies operating e-scooters (Bird, Lime, Lyft, Razor, Skip, and Spin). These dockless vehicles are provided by private companies that give registered users access to a variety of e-bike and e-scooter options. These devices are used through each company-specific mobile phone application. Many dockless vehicles do not have designated stations where pick-up/drop-off activities occur like with Capital Bikeshare; rather, they are parked in public space, most commonly in the “furniture zone” or the portion of sidewalk between where people walk and the curb, often where other street signs, street furniture, trees, and parking meters are found. In addition to DDOT’s program, dockless pilots and demonstration programs are underway in Arlington County, Fairfax County, the City of Fairfax, the City of Alexandria, and Montgomery County.

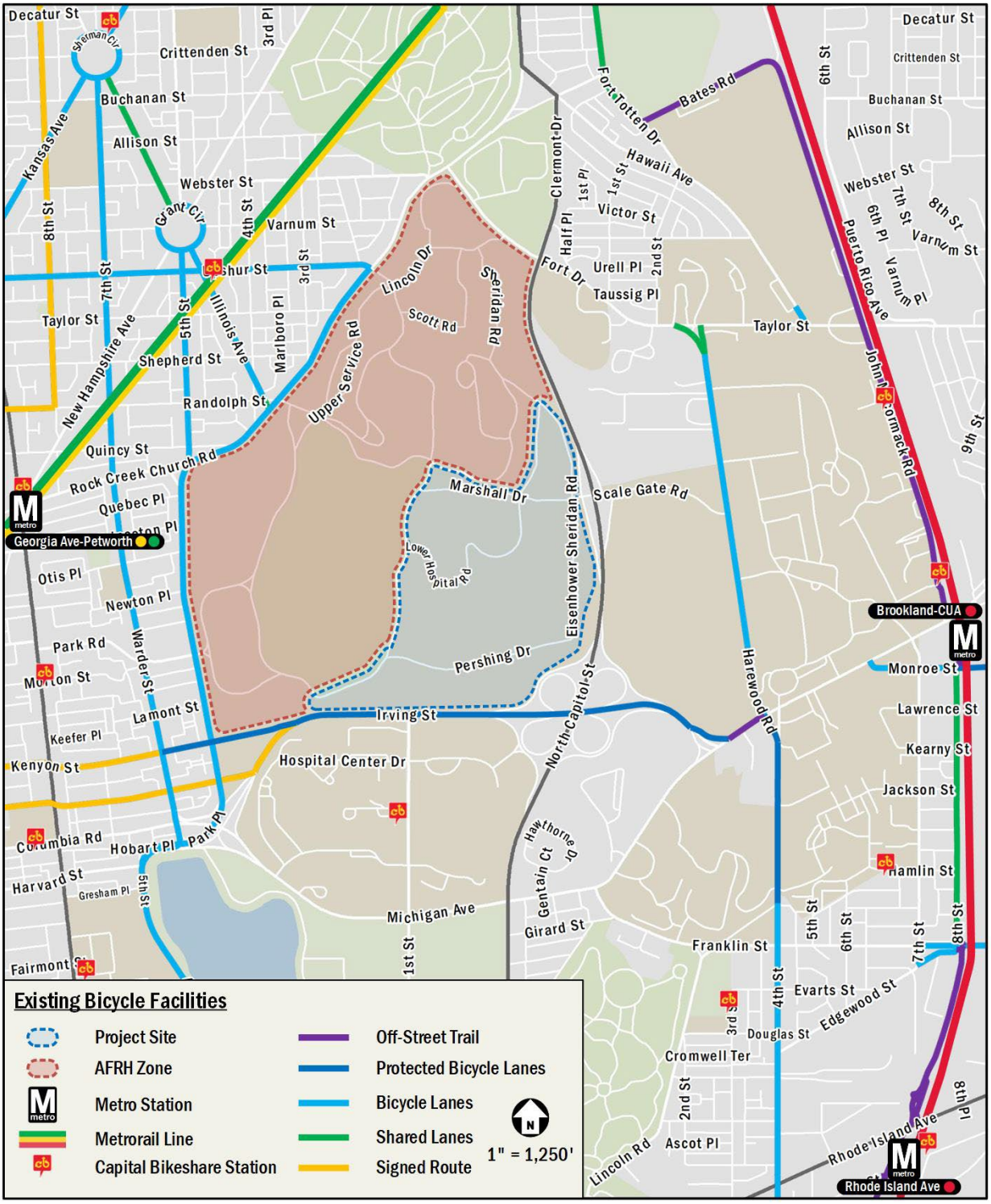

Figure 14: Existing Bicycle Facilities and Capital Bikeshare Stations within the Vicinity of the AFRH-W Site

3.8.1 Impacts to Traffic

3.8.1.1 Alternative 1: No Action

The No Action Alternative (Alternative 1) includes future anticipated peak hour traffic volumes for roadways near the site with the existing planned developments. These volumes are the sum of the existing traffic volumes, background growth in the area, and approved, but un-built, developments in the study area. Under this alternative, new development will not occur on AFRH-W property. This section reflects the results of the No Action condition as described in the most updated analysis contained in the *Comprehensive Transportation Review for the Armed Forces Retirement Home in Washington DC*, prepared by Gorove Slade and dated October 19, 2021. The selected horizon year of 2037 corresponds to the full site build out year as identified in the Gorove Slade report.

Forecast data was obtained from the Metropolitan Washington Council of Governments (MWCOG) 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 the following nearby redevelopment projects that will likely impact traffic within the study area:

- Michigan and Irving Development
- McMillian Reservoir PUD

Project background growth volumes and development volumes were summed to obtain 2037 Background/No Build Condition volumes for the AM and PM peak hours (Table 26). These volumes were modeled in Synchro 10 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. Under the No Action condition, eight of the intersections within the study area will operate at an unacceptable LOS (E or F) during one or both peak hours.

Table 26: 2037 No Action Alternative LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Buchanan St NE	F (119.4)	A (5.9)
North Capitol St & Rock Creek Church Rd NW	C (28.6)	F (86.9)
North Capitol St/Hawaii Ave & Allison St NE/NW	F (179.9)	F (143.8)
North Capitol St & Harewood Rd NW/Fort Drive NE	E (73.3)	F (161.4)
SB North Capitol St Ramp & Scale Gate Rd	A (4.1)	A (1.7)
NB North Capitol St Ramp & Scale Gate Rd	B (10.1)	A (9.8)
First St NW & Irving St NW	E (64.8)	D (54.8)
North Capitol St & Michigan Ave NE/NW	F (105.4)	F (208.7)
Michigan Ave NE & Irving St NE	D (39.2)	C (25.6)
Irving St NW & Ramp from SB North Capitol St	B (10.8)	A (2.9)
Park Pl NW & Kenyon St NW	F (284.1)	F (259.7)
Park Pl NW & Irving St NW	B (10.2)	A (8.8)

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
Irving St NW & Hobart Pl NW	C (27.2)	C (26.8)
First St NW & Michigan Ave NW	D (42.2)	F (96.3)
Irving St & Michigan At Irving Driveway	A (7.6)	B (11.0)

3.8.2.2 Alternative 2: Master Plan Amendment 1

This section contains analysis results from the *Armed Forces Retirement Home Master Plan Comprehensive Transportation Review*, prepared by Stantec Consulting Services, Inc. and dated January 5, 2017. In this study, the site was 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 will be generated by each use, as shown in Table 27. It should be noted that because the project was 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 27: Mixed-Use Development (Zone A) Trip Generation (With Trip Credits) for Alternative 2

Land Use	ITE LUC	Quantity	Methodology	AM			PM		
				In	Out	Total	In	Out	Total
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
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

Land Use	ITE LUC	Quantity	Methodology	AM In	AM Out	AM Total	PM In	PM Out	PM Total
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 will 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 28).

Table 28: Targeted Mode Splits for Alternative 2

Mode	Split Office/Medical Office/Institutional/Retail	Split Residential
Auto	75%	63%
Bus	9%	12%
Metrorail	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 will not be altered significantly between 2040 (the MWCOG 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 were assigned to the study area network 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.

Alternative 2 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 analysis are summarized in Table 29. Under Alternative 2, eight of the intersections within the study area will operate at an unacceptable LOS (E or F) during one or both peak hours. This will result in a major, long-term, adverse impact.

Table 29: 2045 Alternative 2 LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Rock Creek Church Rd NW/Buchanan St NE	E (70.7)	F (155.3)
North Capitol St & Hawaii Ave/Allison St	F (275.5)	F (247.7)
North Capitol St & Harewood Rd NW/Fort Drive NE	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)
Irving St NW & First St NW/Main Site Driveway	E (78.9)	F (240.7)
North Capitol St & Michigan Ave NE/NW	F (122.8)	F (110.4)
Michigan Ave NE & Irving St NE	B (20.0)	C (26.6)
Hobart Pl NW & Irving St NW	B (17.6)	C (20.6)
Irving St NW & Ramp from SB North Capitol St	B (11.7)	A (3.2)
Park Pl NW & Kenyon St NW	C (25.5)	B (11.0)
Park Pl NW & Irving St NW	C (25.6)	C (20.9)
First St NW & Michigan Ave NW	E (68.4)	E (78.5)
Irving St NE & Michigan At Irving Driveway	B (13.9)	C (20.6)
Irving St NW & Secondary Site Driveway	C (22.4)	D (35.5)

Mitigation Measures

At the time that the Stantec report was conducted, DDOT required 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 will result in an exponential increase in delay, and will likely require mitigation measures, such as additional travel lanes, that will not be appropriate or desirable for the study area transportation network. Therefore, mitigation measures that will 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 NE 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 NW/NE.
- 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 NW, 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

Since this alternative was meant to analyze a maximum level of development on the AFRH-W site, it did not reflect the proposal of a selected developer. 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 will 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 30 identifies which mitigation measure will 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 30: 2045 Alternative 2 Mitigation Measure Phasing

Threshold	Mitigation Measure
20%	Upgrade all study area signalized intersections to be fully actuated and optimize phasing and offsets (DDOT). 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) 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) 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).
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%	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%	Provide an additional southbound through lane at the intersection of North Capitol Street and Harewood Road (Developer). Implement traffic adaptive or demand responsive signals on North Capitol Street (DDOT).

Table 31, below, shows the results of the intersection capacity analyses for the full build with the above listed mitigation. As a result of the mitigation measures, seven of the intersections within the study area will operate at an unacceptable LOS (E or F) during one or both peak hours. This will result in a major, long-term, adverse impact.

Table 31: 2045 Master Plan Alternative with Mitigation LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Rock Creek Church Rd NW/Buchanan St NE	D (43.3)	E (77.8)
North Capitol St & Hawaii Ave NE/Allison St NE	F (189.0)	F (140.4)
North Capitol St & Harewood Rd NW/Fort Drive NE	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)
Irving St NW & First St NW/Main Site Driveway	D (39.0)	F (134.6)
North Capitol St & Michigan Ave NE/NW	F (132.3)	F (138.7)
Michigan Ave NE & Irving St NE	B (16.9)	B (17.6)
Hobart Pl NW & Irving St NW	B (17.6)	B (17.5)
Irving St NW & Ramp from SB North Capitol St	B (15.2)	A (9.7)
Park Pl NW & Kenyon St NW	C (28.2)	B (15.1)
Park Pl NW & Irving St NW	C (31.9)	C (21.6)
First St NW & Michigan Ave NW	E (68.4)	D (41.9)
Irving St NE & Michigan At Irving Driveway	A (4.0)	A (5.0)
Irving St NW & Secondary Site Driveway	B (13.2)	B (18.2)

Alternative 2 with Crosstown Study Network

At the time the Stantec report was conducted, DDOT was engaging in a study to 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 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 analysis are summarized in Table 32. Under the Master Plan Alternative with Crosstown Study Network, ten of the intersections within the study area will operate at an unacceptable LOS during one or both peak hours. This will result in a major, long-term, adverse impact.

Table 32: 2045 Alternative 2 with Crosstown Study Network LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Rock Creek Church Rd NW/Buchanan St NE	E (70.2)	E (75.9)
North Capitol St & Hawaii Ave NE/Allison St NE	F (277.4)	F (245.8)
North Capitol St & Harewood Rd NW/Fort Drive NE	F (114.3)	F (292.6)
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)
Irving St NW & First St NW/Main Site Driveway	F (175.3)	F (374.7)
North Capitol St & Michigan Ave NW/NE	F (171.4)	F (157.2)
Michigan Ave NE & Irving St NE	C (21.6)	B (15.5)
Hobart Pl NW & Irving St NW	B (17.6)	B (17.5)
North Capitol St & North Capitol Connector	E (55.6)	F (87.1)
Irving St NW & North Capitol Connector	F (282.0)	F (85.4)
Park Pl NW & Kenyon St NW	C (24.4)	C (32.9)
Park Pl NW & Irving St NW	C (32.4)	B (17.5)
First St NW & Michigan Ave NW	F (92.3)	F (159.2)
Irving St NE & Michigan At Irving Driveway	A (3.7)	A (3.0)
Irving St NW & Secondary Site Driveway	B (15.8)	C (34.2)

2045 Crosstown Study Full Build - with Mitigation

Stantec developed and evaluated mitigation measures that will address the additional intersection delay while considering multi-modal transportation needs and potential ROW impacts if the recommendations of the Crosstown Multimodal Study were implemented. 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 NE 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 NW/NE.
- 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 NW.
- Provide an additional southbound left-turn lane and westbound right-turn lane at the intersection of Michigan Avenue NW and First Street NW.

This alternative was meant to analyze a maximum level of development on the AFRH-W site and does not reflect the proposal of a selected developer. 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 will 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 33 identifies which mitigation measure will 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 33: Vehicle Mitigation Measure Implementation Strategy – Alternative 2 with Crosstown Study Network

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).

Table 34 below show the results of the intersection analysis for the full build with Crosstown Study Network. Under the Master Plan Alternative with Crosstown Study Network, ten of the intersections within the study area will operate at an unacceptable LOS during one or both peak hours. This will result in a major, long-term, adverse impact.

Table 34: 2045 Alternative 2 with Crosstown Study Network and Mitigation LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Rock Creek Church Rd NW/Buchanan St NE	E (71.7)	C (26.4)
North Capitol St & Hawaii Ave NE/Allison St NE	F (124.8)	F (145.0)
North Capitol St & Harewood Rd NW/Fort Drive NE	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)
Irving St NW & First St NW/Main Site Driveway	D (40.4)	F (106.3)
North Capitol St & Michigan Ave NW/NE	F (129.4)	F (141.6)
Michigan Ave NE & Irving St NE	C (25.3)	B (16.4)
Hobart Pl NW & Irving St NW	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)
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 NW & Kenyon St NW	C (20.9)	B (15.8)
Park Pl NW & Irving St NW	C (28.2)	C (20.6)
First St NW & Michigan Ave NW	C (29.1)	D (53.8)
Irving St NE & Michigan At Irving Driveway	A (3.8)	A (3.1)
Irving St NW & Secondary Site Driveway	C (28.5)	C (27.6)

3.8.1.3 Alternative 3: Master Plan Amendment 2

This section contains analysis results from the *Comprehensive Transportation Review for the Armed Forces Retirement Home Redevelopment*, prepared by Gorove Slade and dated October 19, 2021. The site is expected to be fully developed by 2037 with a mix of uses including:

- 2,918 multi-family residential units
- 194 townhomes
- 344 senior housing units
- 190,779 SF of general retail
- 51,337 SF of grocery store retail
- 732,846 SF of general office
- 319,077 SF of medical office

Traditionally, weekday peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 10th Edition. This methodology was supplemented to account for the urban nature of the project (the Trip Generation Manual provides data

for non-urban, low transit use sites) and to generate trips for multiple modes, as vetted and approved by DDOT.

Trip generation was calculated based on the following:

- ITE land use 221, Multifamily Housing (Mid-Rise), for the multifamily units
- ITE land use 220, Multifamily Housing (Low-Rise), for the townhouse units
- ITE land use 255, Continuing Care Retirement Community, for the senior housing component of the project.
- ITE land use 710, General Office Building, for the general office component of the project.
- ITE lane use 720, Medical-Dental Office Building, for the medical office component of the project.
- ITE land use 820, Shopping Center, for the neighborhood-service/ground-floor retail component of the project.
- ITE land use 850, Supermarket, for the grocery store component of the project.
- ITE land use 310, Hotel

The calculated trips were then split trips into different modes using assumptions outlined in Table 35, which were developed utilizing Census data for residents that live near the study area and/or commuters that work near the study area. In addition, data contained in the WMATA ridership survey was also utilized. The resulting trip generation estimates are shown in Table 36.

Table 35: Mode Split Assumptions

Land Use	Mode			
	Drive	Transit	Bike	Walk
Residential	55%	35%	5%	5%
Senior Housing	65%	30%	2%	3%
Office	65%	30%	2%	3%
Retail	30%	25%	15%	30%
Grocery	60%	15%	5%	20%
Hotel	60%	15%	5%	20%

Table 36: Mixed-Use Development (Zone A) Trip Generation (With Trip Credits) for Alternative 3

Mode	AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour		
	In	Out	Total	In	Out	Total	Total	In	Out	Total
Phase 1 Trip Generation (2028)										
Auto (veh/hr)	524	404	928	676	906	1,582	18,308	1,038	880	1,918
Transit (ppl/hr)	306	271	577	451	561	1,012	11,569	651	559	1,210
Bike (ppl/hr)	52	48	100	110	115	225	2,497	138	123	261
Walk (ppl/hr)	123	91	214	247	263	510	5,714	306	281	587
Phase 2 Trip Generation (2030)										
Auto (veh/hr)	37	83	120	111	82	193	2,201	104	102	206
Transit (ppl/hr)	35	67	102	107	87	194	2,141	109	103	212
Bike (ppl/hr)	12	13	25	37	35	72	748	43	40	83
Walk (ppl/hr)	21	20	41	63	67	130	1,329	79	73	152
Phase 3 Trip Generation (2032)										
Auto (veh/hr)	292	68	360	81	307	388	3,986	129	112	241
Transit (ppl/hr)	165	42	207	50	175	225	2,356	80	69	149
Bike (ppl/hr)	12	3	15	5	12	17	175	6	6	12
Walk (ppl/hr)	15	7	22	4	18	22	245	7	8	15
Phase 4 Trip Generation (2037)										
Auto (veh/hr)	207	173	380	194	266	460	5,065	185	181	366
Transit (ppl/hr)	129	128	257	155	183	338	3,752	148	145	293
Bike (ppl/hr)	16	20	36	34	35	69	737	36	35	71
Walk (ppl/hr)	24	24	48	50	57	107	1,126	59	56	115
Total Proposed Trip Generation (2037)										
Auto (veh/hr)	1,060	728	1,788	1,062	1,561	2,623	29,560	1,456	1,275	2,731
Transit (ppl/hr)	635	508	1,143	763	1,006	1,769	19,818	988	876	1,864
Bike (ppl/hr)	92	84	176	186	197	383	4,157	223	204	427
Walk (ppl/hr)	183	142	325	364	405	769	8,414	451	418	869

As shown on Table 36, the proposed AFRH-W development is expected to generate trips on the surrounding transportation network across all modes. The AM peak hour trip generation is projected to include 1,788 vehicles/hour, 1,143 transit riders/hour, 176 bicycle trips/hour, and 325 walking trips/hour at full buildout. The PM peak hour trip generation is projected to include 2,623 vehicles/hour, 1,769 transit riders/hour, 383 bicycle trips/hour, and 769 walking trips/hour at full buildout. The Saturday peak hour trip generation is projected to include 2,731 vehicles/hour, 1,864 transit riders/hour, 427 bicycle trips/hour, and 869 walking trips/hour at full buildout.

A comparison between the full buildout trip generation for Alternative 2 and the full buildout trip generation for Alternative 3 during the AM and PM peak hours is presented in Table 37. As shown in Table 37, the proposed trip generation for Alternative 3 represents a reduction in trip generation as compared to Alternative 2. The proposed project in Alternative 3 will generate 1,018 fewer trips during the morning peak hour and 1,561 fewer trips during the afternoon peak hour than Alternative 2.

Table 37: Vehicular Trip Generation Comparison between Alternatives 2 and 3

Master Plan	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Alternative 2	1,799	1,007	2,806	1,701	2,483	4,184
Alternative 3	1,060	728	1,788	1,062	1,561	2,623
Net Difference	**-739**	**-279**	**-1,018**	**-639**	**-922**	**-1,561**

Trip Distribution - Trip distribution for the site-generated trips was determined based on: (1) Census Transportation Planning Products (CTPP) Traffic Analysis Zone (TAZ) data, (2) existing and future travel patterns in the study area, and (3) previously approved methodologies employed in studies within the vicinity of the site. Based on this review and the site access locations, the site-generated trips were distributed through the study area intersections. Trip distribution assumptions and specific routing were analyzed by land use for inbound and outbound trips. These volumes were added to the No Action Alternative volumes to obtain 2045 Future Build Condition Volumes.

Alternative 3 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 analysis are summarized in Table 38. Under Alternative 3, eight of the intersections within the study area will operate at an unacceptable LOS (E or F) during one or both peak hours. This will result in a major, long-term, adverse impact.

Table 38: 2037 Alternative 3 LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Buchanan St NE	F (128.4)	A (6.1)
North Capitol St & Rock Creek Church Rd NW	D (35.4)	F (97.2)
North Capitol St & Hawaii Ave NE/Allison St NE	F (189.4)	F (154.3)
North Capitol St & Harewood Rd NW/Fort Drive NE	E (79.8)	F (172.6)
SB North Capitol St Ramp & Scale Gate Rd	A (4.8)	A (1.9)
NB North Capitol St Ramp & Scale Gate Rd	B (10.6)	B (10.2)
Irving St NW & First St NW/Main Site Driveway	E (77.4)	E (67.9)
North Capitol St & Michigan Ave NE/NW	F (113.5)	F (218.0)
Michigan Ave NE & Irving St NE	D (41.2)	C (26.4)
Hobart Pl NW & Irving St NW	C (27.3)	C (27.1)
Irving St NW & Ramp from SB North Capitol St	B (11.7)	A (3.2)
Park Pl NW & Kenyon St NW	F (292.3)	F (275.7)
Park Pl NW & Irving St NW	B (10.2)	A (8.9)
First St NW & Michigan Ave NW	D (42.8)	F (101.2)
Irving St NE & Michigan At Irving Driveway	A (7.6)	B (11.4)
Irving St NW & Secondary Site Driveway	A (0.2)	A (0.5)

Mitigation Measures

Based on DDOT standards, a project is considered to have an impact at an intersection within the study area if any of the following conditions are met:

- The capacity analyses show a LOS E or F at an intersection or along an approach in the future with conditions with the project where one does not exist in the background conditions;
- There is an increase in delay at any approach or overall intersection operating under LOS E or F of greater than 5 percent when compared to the background conditions;
- The 95th percentile queues exceed storage along an approach in the future conditions with the project where one does not exist in the background scenario; or
- There is an increase in the 95th percentile queues by more than 150 feet along an approach in that exceeds storage in the background scenario.

Based on these criteria, the following intersections are impacted by Alternative 3:

- North Capitol Street and Buchanan Street NE
- Rock Creek Church Road NW and North Capitol Street/Hawaii Avenue NE
- Allison Street NE and Hawaii Avenue NE/North Capitol Street
- North Capitol Street and Harewood Road NE

- Irving Street NW and First Street/Future Site Access NW
- Irving Street NE & Michigan Avenue NE
- Park Place NW & Kenyon Street NW
- Michigan Avenue NW & First Street NW
- N Capitol Street & Michigan Avenue NW/NE

A summary of the recommended mitigation measures to offset impacts to vehicular operations in the study area associated with Alternative 3 is provided below, all of which will be constructed by Phase 1 of the proposed development:

Irving Street NW and First Street NW:

- Extension of First Street NW northward from the Irving Street NW and First Street NW intersection to serve as the gateway access for the site with inbound and outbound access available between Parcel C and Parcel E.
- Addition of a northbound-thru lane along First Street NW into the site.
- Addition of an eastbound left-turn lane along Irving Street NW into the site.
- Signal modification to accommodate site access.

North Capitol Street and Allison Street NE/Hawaii Avenue NE:

- Curb extensions w/flex posts and white and tan pavement markings at the western corners of North Capitol Street and Allison Street NW.
- Curb extension w/flex posts and white and tan pavement markings at the northeast corner of North Capitol Street and Allison Street NE.
- Large curb extension w/flex posts and white and tan pavement markings at the southwest corner of North Capitol Street and Allison Street NE.
- Curb extensions to provide 10-foot clearance between crosswalks and parking zones on Allison Street.

North Capitol Street and Rock Creek Church Road NW/Buchanan Street NE:

- Stripe extension of existing painted curb lane buffer to north of Buchanan Street.
- Upgrade crosswalk across North Capitol Street to a high visibility crosswalk.

Physical roadway improvements that increase capacity are only proposed for the intersection of Irving Street NW and First Street NW/Site Driveway as part of Phase 1, which will be completed in 2028. As such, the impact of the mitigation measures is already accounted for in the 2037 capacity analysis results shown in Table 38.

In addition to physical roadway improvements, transportation demand management (TDM) measures are recommended to be implemented onsite to reduce single-occupancy vehicle trips. The site

developer will work with DDOT to establish a plan that outlines measures that will be applied onsite. These measures will be applied as appropriate for each development phase.

Alternative 3 with Cloverleaf Urbanization Project

As requested by DDOT, capacity analysis results are also presented for the 2042 scenario (full buildout +5 years). The intersection geometry assumptions are based on the cloverleaf urbanization concept shared by the Office of Planning, ramps volume assumptions based on various data sources, and additional regional growth between 2037 and 2042.

The capacity analysis results are shown in Table 39. The table shows that the addition of regional growth volumes and the urbanized cloverleaf intersection improvements result in conditions that are comparable to the 2037 future conditions.

With the new site access points, conditions improve at the Irving Street and First Street NW/Site Access intersection during the morning and afternoon peak hours due to a decrease in southbound left-turning traffic that can exit the site at alternate locations.

Due to left-turn restrictions, the northbound and southbound approaches operate within capacity during the morning peak hour at the two new North Capitol Street and Future Ramp Road intersections. During the afternoon peak hour, the overall intersection and all approaches with the exception of the southbound approach experience unacceptable delays, consistent with results at the North Capitol Street and Michigan Avenue intersection.

Results of the cloverleaf urbanization capacity analysis are provided for reference and do not trigger mitigation for the proposed project. Recommendations to ensure the efficient operations include following the cloverleaf include corridor-wide cycle length and offset optimization to ensure signal operations reflect the network changes.

Upon completion of the urbanization of the cloverleaf and North Capitol Street corridor, the developer will provide the following additional access to the site:

- One additional connection to North Capitol Street, north of the boiler plant.
- One additional connection to North Capitol Street between Parcel F and Parcel P, consistent with the connection shown in the 2021 DDOT North Capitol Cloverleaf Urbanization Study.

One additional connection to Irving Street NW between Parcels E and F, consistent with the connection shown in the 2021 DDOT North Capitol Cloverleaf Urbanization Study.

Table 39: 2037 Alternative 3 with Urbanized Cloverleaf LOS at Studied Intersections

Intersection	AM Peak (Delay) LOS	PM Peak (Delay) LOS
North Capitol St & Buchanan St NE	F (135.7)	A (6.4)
North Capitol St & Rock Creek Church Rd NW	D (40.6)	F (104.2)
North Capitol St & Hawaii Ave NE/Allison St NE	F (196.4)	F (164.7)
North Capitol St & Harewood Rd NW/Fort Drive NE	F (84.7)	F (180.1)
SB North Capitol St Ramp & Scale Gate Rd	A (4.3)	A (1.7)
NB North Capitol St Ramp & Scale Gate Rd	B (10.6)	B (10.2)
Irving St NW & First St NW/Main Site Driveway	E (63.3)	E (57.5)
North Capitol St & Michigan Ave NE/NW	F (133.8)	F (238.8)
Michigan Ave NE & Irving St NE	D (44.0)	C (24.8)
Hobart Pl NW & Irving St NW	C (27.3)	C (26.9)
Park Pl NW & Kenyon St NW	F (295.5)	F (277.8)
Park Pl NW & Irving St NW	B (10.3)	A (8.8)
First St NW & Michigan Ave NW	D (49.1)	F (145.2)
Irving St NE & Michigan At Irving Driveway	A (6.7)	A (7.9)
Irving St NW & Secondary Site Driveway	A (0.2)	A (0.5)
Irving St NW & Future Cloverleaf Road//Site Access	C (26.7)	C (20.8)
N Capitol St & Future Cloverleaf Road	C (29.0)	E (79.0)
Irving St NE & Future Cloverleaf Road	C (20.6)	C (34.7)
N Capitol St & Future Cloverleaf Road/Site Access	D (37.1)	F (85.2)

3.8.2 Impacts to Transit Services

3.8.2.1 Alternative 1: No Action Alternative

While the background transit trip growth rate will 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 will 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. This will have a substantial impact on transit capacity within the study area.

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 for the McMillan development calls for a site-specific shuttle service to connect the site to the Brookland-CUA Metrorail station.

3.8.2.2 Alternative 2: Master Plan Amendment 1

Upon full build-out, the AFRH-W site under Alternative 2 is anticipated to generate a total of 936 new AM peak hour transit trips and 1,014 PM peak hour transit trips. This is anticipated to significantly increase demand on the existing bus routes serving the study area, resulting in all routes experiencing a rider-to-capacity ratio that is greater than 1.1 and that exceeds WMATA standards. The most significant capacity deficiencies will exist on Routes D8, H2, H3, and H4. While the deficiency on Route D8 will be due largely to Background/No Build condition transit ridership, deficiencies on Routes H2, H3, and H4 will be due to the large amount of Metrorail passengers generated by the ARFH-W site. This will result in a major, long-term, adverse impact.

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 hospital campus and other developments.
- 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 will result in a significant increase in capacity, thus improving overall rider-to-capacity ratios for most routes.

3.8.2.3 Alternative 3: Master Plan Amendment 2

Upon full build-out, the AFRH-W site under Alternative 3 is anticipated to generate a total of 1,143 new AM peak hour transit trips and 1,769 PM peak hour transit trips. Based on existing TAZ data, approximately 53 percent of residential transit trips are anticipated by bus while approximately 47 percent of residential transit trips are anticipated by Metrorail. For office commutes, approximately 30 percent of transit trips are anticipated by bus and 70 percent are anticipated by Metrorail. This is anticipated to significantly increase demand on the existing bus routes serving the study area, resulting in all routes experiencing a rider-to-capacity ratio that is greater than 1.1 which that exceeds WMATA standards. The most significant capacity deficiencies will exist on Routes D8, H2, H3, and H4. While the deficiency on Route D8 will be due largely to Background/No Build condition transit ridership, deficiencies on Routes H2, H3, and H4 will be due to the large amount of Metrorail passengers generated by the ARFH site. This will result in a major, long-term, adverse impact.

However, it should be noted that the Transit Priority Network in the MoveDC 2021 update may impact the study area transit services sometime in the future. MoveDC 2021, which is the District's multimodal long-range transportation plan, proposes transit priority infrastructure such as dedicated transit lanes, better transit stops, and/or special treatments for buses at intersections along designated corridors. Specific treatments along given streets or route paths are not proposed but rather prioritized as part of the long-range plan. Transit priority corridors proposed near the proposed project include:

- North Capitol Street from Massachusetts Avenue NW to the intersection of Riggs Road NE and 1st Place NE near Fort Totten Metrorail station
- Columbia Road NW and Irving Street NW through Columbia Heights to Warder Street NW
- Michigan Avenue NW/NE and Monroe Street NE from Hobart Place NW to the Brookland-CUA Metrorail Station

Both the Columbia Road/Irving Street and Michigan Avenue/Monroe Street transit priority corridors have additionally been recommended in greater detail in the 2016 Crosstown Multimodal Transportation Study in coordination with moveDC.

Additionally, it should be noted that on-going DC Circulator Transportation Development Planning and WMATA Bus Planning efforts are taking place to evaluate demand in the vicinity of the AFRH Zone A development. Additional transit services to the site should be coordinated with DDOT and WMATA in the future.

Mitigation Measures

An assessment of existing transit capacity and service indicates several needs, including:

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

In order to address these needs, several mitigation measures are recommended:

- Coordinate with WMATA to evaluate the potential for enhanced connections to the Columbia Heights and Brookland-CUA Metrorail stations by providing a circulator route that provides service to the AFRH-W site, as well as the hospital center, and other nearby developments.
- Continue coordination with WMATA and DDOT regarding future transit services, as well as bringing existing and future transit services onto the AFRH-W site.
- Constructing an on-site transit center that includes a climate-controlled waiting area with rider amenities, such as restrooms.

It should also be noted that the potential future improvements contained in the moveDC 2021, Crosstown Multimodal Transportation Study, and the ongoing DC Circulator planning, in combination with the recommended mitigation measures could result in additional capacity being made available for trips generated from the AFRH-W site and reduce the impact of the additional transit trips on the overall transit network.

3.8.3 Impacts to Pedestrians and Bicycle Facilities

3.8.3.1 Alternative 1: No Action Alternative

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

3.8.3.2 Alternative 2: Master Plan Amendment 1

The AFRH-W site will not have a negative impact on existing or proposed pedestrian and bicycle facilities in Alternative 2. In fact, many of the recommendations presented in City plans will be necessary to ensure adequate connections between the AFRH-W site, nearby transit options, and surrounding community. These enhancements will 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.

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.
- 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 15 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 will 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 NW/Kenyon Street NW between Park Place NW 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 NW and Harewood Road NW. The path will connect to the proposed path on Irving Street NW, 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 NE.
- 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 will these facilities improve overall pedestrian and bicycle circulation within the area of the site, they will also 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, will 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 NW/NE and sidewalk and bike lanes on Scale Gate Road will provide the needed connections between the AFRH-W site and transit services. The multi-use path on Irving Street NW/NE will tie into pedestrian and bicycle facilities on Michigan Avenue NE and Kenyon Road/Irving Street NW which ultimately will connect to the Brookland-CUA and Columbia Heights Metrorail stations and other bus routes. The proposed bike lanes and sidewalks on Scale Gate Road will connect the northern end of the site to the Brookland-CUA Metrorail 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 on-site 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 Metrorail station. However, additional facilities will be needed to provide the necessary coverage and capacity to make it a reliable travel option.

Bikeshare stations are provided within one block of both Metrorail 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 Metrorail 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 15. Proposed External Bicycle and Pedestrian Facilities

3.8.3.3 Alternative 3: Master Plan Amendment 2

Similar to Alternative 2, the AFRH-W site will not have a negative impact on existing or proposed pedestrian and bicycle facilities in Alternative 3. In fact, the internal pedestrian and bicycle network as well as improvements necessary on the external network will enhance pedestrian and bicycle access through the study area.

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.

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 will be incorporated within the AFRH-W site (Figure 16 and Figure 17):

- 15-foot sidewalks with 5-foot tree/furnishing zones along both sides of Scale Gate Road NW from the pasture drive to the North Capitol Street ramps;
- An 8-foot sidewalk and a 10-foot multi-use path with a 6-foot tree/furnishing zone on one side and an 8-foot sidewalk with a 6-foot tree/furnishing zone on the other side of First Street NW from Irving Street NW to Pershing Drive NW;
- An 8-foot sidewalk and a 10-foot multi-use path with a 9-foot tree/furnishing zone on one side and a combined 19-foot sidewalk and tree/furnishing zone on the other side of Pershing and Eisenhower Drives NW;
- A 10-foot multi-use path with a 6.5-foot tree/furnishing zone on one side and a 6-foot sidewalk with a 7.5-foot tree/furnishing zone on the other side of proposed pasture drive;
- A 6-foot sidewalk with a 5.5-foot tree/furnishing zone on one side and a 5.5-foot sidewalk on the other side of internal neighborhood streets;
- A 14-foot sidewalk with a 16-foot tree/furnishing zone on one side and a 10-foot sidewalk with a 14-foot tree/furnishing zone on the street between Blocks E and F, prior to urbanization of the North Capitol Street cloverleaf;
- Upon urbanization of the North Capitol Street cloverleaf, this internal roadway segment between Blocks E and F will be reconstructed to have a 10-foot sidewalk alongside a 2-foot buffer and 10-foot multi-use path with a 6-foot tree/furnishing zone on one side and an 8-foot sidewalk with a 14-foot tree/furnishing zone on the other side;
- A 6-foot sidewalk with a 5.5-foot tree/furnishing zone on one side and an 8-foot sidewalk with a 5-foot tree/furnishing zone on the other side of Arnold Drive NW between Irving Street NW and Pershing Drive NW;
- An 8-foot sidewalk with a 5-foot tree furnishing zone along the west side of Block H south of the Boiler Plant; and
- A two-lane, curbless street connecting Block H to the Boiler Plant, providing a shared facility to be used by all road users.
- A multi-use path will be constructed along the north side of Irving Street NW from the east-most non-vehicular access between Blocks E and F to the west-most vehicular access at the existing Arnold Drive NW.
- Bikeshare and micromobility parking as follows:
    - Phase 1: One 19-dock Capital Bikeshare station on-site
    - Phase 2: One 8-bay micromobility parking and charging station
    - Phase 3: One 19-dock Captial Bikeshare station on-site, and one 8-bay micromobility parking and charging station
    - Phase 4: One 19-dock Capital Bikeshare station on-site, and one 19-dock Capital Bikeshare station off-site

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 16 and Figure 17, and are described below:

- A facility along the Irving Street frontage that extends west from the existing interchange to Park Place NW that consists of a 10-foot path with 6-foot tree boxes that extends from North Capitol Street to Park Place NW. This will be constructed in two phases:
    - Segment 1: Between Park Place NW and First Street NW to be completed by Phase 2.
    - Segment 2: Between Park Place NW and North Capitol Street to be completed by the end of Phase 4 or as part of DDOT's North Capitol Street/Cloverleaf urbanization project (no later than 2033).
- A 6-foot sidewalk with 4-foot green buffer along North Capitol Street between Scale Gate Road and Irving Street NW to be completed by the end of Phase 4 or as part of DDOT's North Capitol Street/Cloverleaf urbanization project (no later than 2033).
- One off-site 19-dock Capital Bikeshare station.

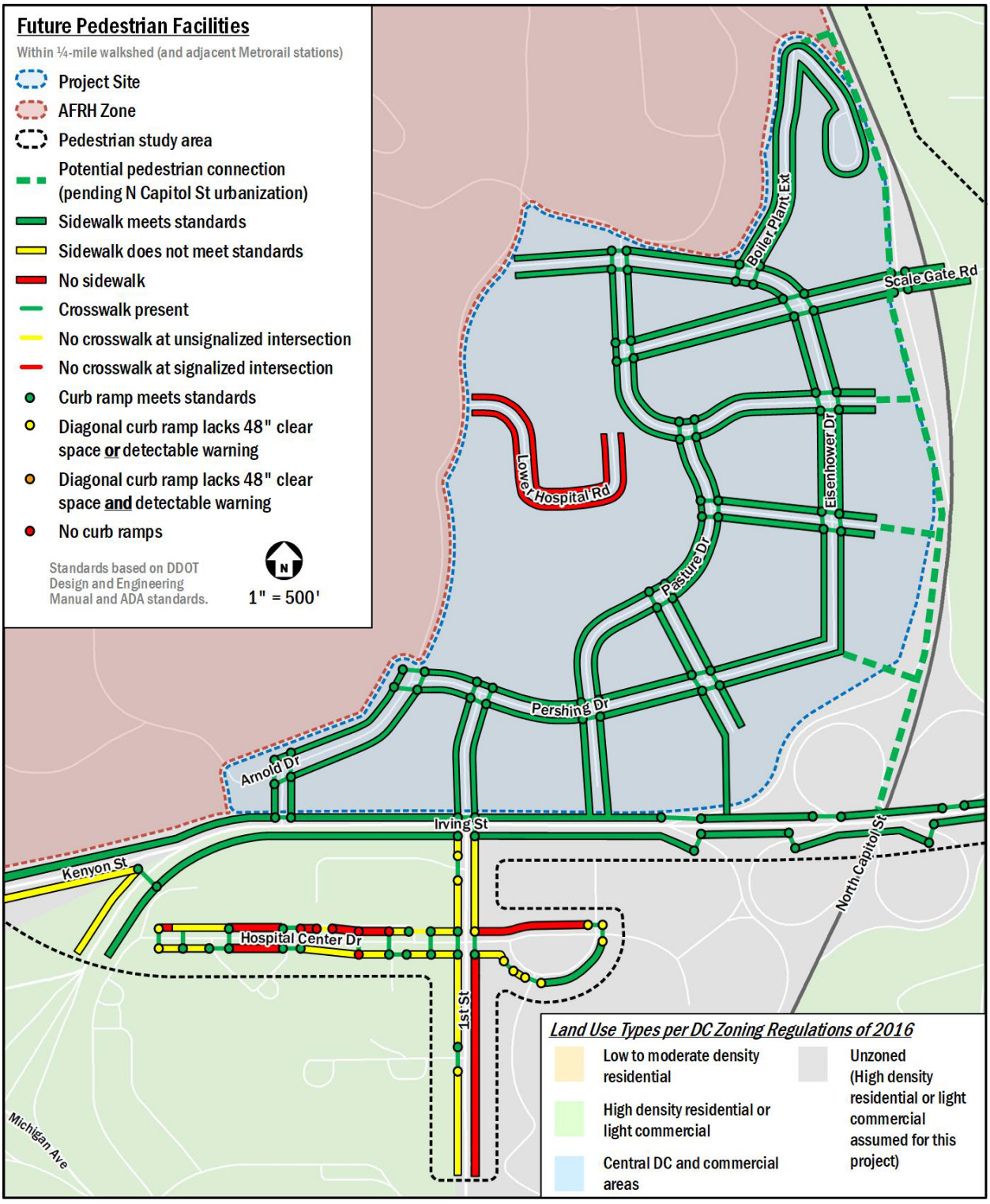

Figure 16: Future Planned Pedestrian Facilities Proposed in Alternative 3

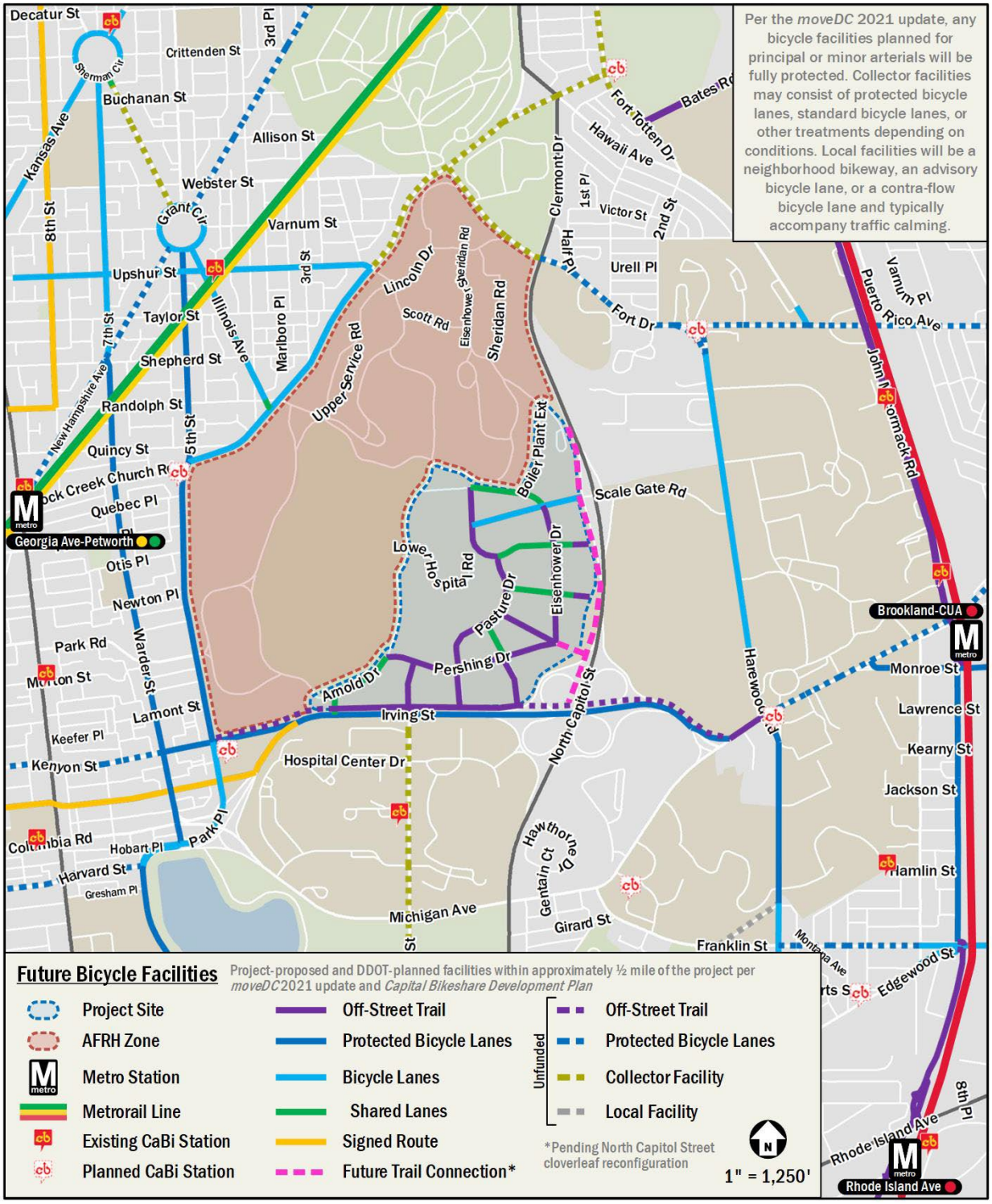

Figure 17: Future Planned Bicycle Facilities Proposed in Alternative 3

3.9 Environmental Contamination

In advance of the 2008 EIS, A Phase I Environmental Site Assessment (ESA) was conducted for AFRH-W in July 2005 (G&O 2005), and a Phase II ESA was completed in April 2006 (MACTEC 2006). 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 40.

Table 40: 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 completed by Stantec in March 2015 to assess the 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 on-site structures, it is possible that these materials are present at AFRH-W.

The following observations are quoted from the 2015 Phase I ESA:

- 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 (PCE and TCE) and EPA Maximum Contaminant Levels (MCLs) [PCE only]. 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 500-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. Inactive USTs must be properly closed, including an assessment for leaks and evidence of past releases. The inactive USTs represent a REC.
- 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).

Additional information of the RECS is discussed in Table 41.

Table 41. Status of the RECs and Other Items Identified in the 2015 Phase I ESA and Recommended Actions

REC/other item	Status	Resolved	Recommended Actions
Elevated concentration of naphthalene in soil in the vicinity of Building 46.	The 2018 Phase II ESA determined that the naphthalene detected in soil by MACTEC was from a tar base layer and not related to the former dry-cleaning operations. The tar base layer contaminants do not present a concern for the direct contact exposure pathways if this layer remains covered by asphalt.	Yes	None (assuming that the asphalt cover will remain). Should AFRH Partners opt to remove the asphalt roadway and tar base layer located adjacent to the western side of Building 46, this material will be taken off-site to an asphalt recycling facility.
Detection of dry-cleaning solvent related contaminants in groundwater down gradient of Building 46	Groundwater: The 2018 Phase II ESA determined that no dry-cleaning related analytes (TPH-C7-C12, PCE, or PCE degradation products) were detected in the groundwater samples at concentrations that exceeded the RBSLs used in their evaluation.	Yes	None (with respect to groundwater contamination). The existing groundwater monitoring wells at the site should be abandoned by a licensed driller following DOEE notification and District of Columbia Department of Consumer and Regulatory Affairs (DCRA) permitting. These wells include the five wells installed by ABB Environmental Services, Inc. in 1990 (four of which have been found), the six wells installed by MACTEC in 2006 (most notably dry well W46-1), and the three wells installed by CGS. If the need for any of the wells installed by ABB Environmental Services, Inc. in 1990 continues, it is recommended that new surface covers be installed at these locations.
	Soil: The 2018 Phase II ESA determined that detections in soil that exceeded the RBSLs were limited. These detections do not present a concern for the direct contact exposure pathways if this soil remains buried. Because the TPH-C7-C12 concentration exceeds DOEE's Tier 0 Standard, this soil, if excavated, will need to be transported for off-site disposal.	Yes	None (assuming that the USTs are abandoned-in-place and that soil will not be excavated).

REC/other item	Status	Resolved	Recommended Actions
	Subsurface Vapor: The 2018 Phase II ESA determined that detections in subsurface vapor that exceeded the RBSLs were reported in samples collected from two VMPs. These concentrations may present a concern for the vapor intrusion/indoor inhalation exposure pathway if the first floor of Building 46 is re-developed for commercial or residential use. DOEE issued requirements for the future repurposed building: a soil vapor intrusion mitigation system, installation of additional soil vapor monitoring points, and additional delineation of the extent of the soil vapor contamination.	No	Should the potential need for vapor intrusion mitigation exist, based on the re-development plans for Building 46 (i.e., the first floor of Building 46 will be utilized as occupied space), it is recommended that, in addition to installation and sampling of new VMPs consistent with DOEE's requirement to delineate the extent of impact, existing VMPs (minimally VMP-01 and VMP-06) be re-sampled along with indoor air sampling to confirm the results of CGS' single sampling event before pilot testing/design of a vapor intrusion mitigation system is initiated. If additional VMPs are to be installed, a Work Plan will be developed for DOEE review. DOEE should be consulted to determine whether a DCRA permit will need to be obtained for the mitigation system. In the event that the re-development plans for Building 46 do not include use of the first floor of Building 46 as occupied space or that the results of expanded sampling/re-sampling do not confirm the prior results, conversations will be held with DOEE to discuss its requirements for a mitigation system. Any VMPs, that will no longer be needed, and as approved by DOEE, be abandoned.
Elevated concentrations of TPH-DRO in soil at Building 76.	The 2018 Phase II ESA determined that TPH-DRO and TPH-ORO were detected in soil at concentrations that exceeded DOEE's Tier 0 Standard and that TPH-DRO was detected in soil at concentrations that exceeded DOEE's residential subsurface soil Tier 1 RBSL. The lateral extent of the TPH-DRO and TPH-ORO impact to the soil has not yet been defined. Any soil, with TPH-DRO and TPH-ORO concentration that exceed the Tier 0 Standard and that is excavated, will need to be transported for off-site disposal. The TPH-DRO concentrations may present a concern for the vapor intrusion/indoor inhalation exposure pathway if this area is re-developed for residential use and this soil is not removed. In this case, the new residential building(s) in this area may need to be constructed with a vapor barrier to mitigate vapor intrusion. DOEE issued a requirement for horizontal delineation of the TPH-DRO contamination in soil.	No	Additional horizontal delineation of the TPH-DRO contamination in soil should be conducted. In addition to fulfilling DOEE's requirement, this information will be needed by AFRH Partners if any subsurface excavation is planned in this area (for building footers, etc.) to determine the volume of soil that will require off-site disposal. If AFRH Partners plans a subsurface structure for this area (i.e., sub-grade parking garage or basement), and pending DOEE approval, this information could be obtained while excavation for the structure is being performed. Otherwise, this information should be obtained via soil borings. If this information is to be obtained via soil borings, a Work Plan will be developed for DOEE review, and a DCRA permit should be obtained. Depending on the re-development plans for Building 76 and whether soil (that may present a potential vapor intrusion concern) is removed, any planned new residential building(s) in this area may need to be constructed with a vapor barrier to mitigate vapor intrusion. Once DOEE's requirements for this area have been met, a request for closure of LUSTCASE # 2018011 will need to be submitted to DOEE.
Lack of closure letters following the removal USTs near Buildings 52 and 74.	No change.	No	Removal of both USTs will be verified by excavation, geophysical methods and/or further records review. After verification of UST removal, a limited contamination assessment will be conducted in the areas of the former USTs to include collection of soil and groundwater samples for analysis of TPH-DRO.

REC/other item	Status	Resolved	Recommended Actions
1,500-gallon diesel UST near the loading dock for Building 56.	No change.	No	An application for temporary closure of the UST near Building 56 will be made to the DOEE UST Division. Additional criteria must be met for closure including capping the lines and securing the fill ports.
Two inactive USTs near the southwest corner of Building 46	An assessment for evidence of past releases was performed during the 2018 Phase II ESA. The results of the assessment are summarized above. The two inactive USTs were put into temporary closure. Removal of the USTs or abandoning them in place remains to be performed.	No	Once the redevelopment plans for this area have been determined, the procedure to permanently close the USTs will be initiated. The closure process includes DOEE notification, DCRA permitting, removal or abandonment by a licensed UST contractor, and follow-up reporting. If the USTs are removed, it is recommended that the soil at SB-10 (7') also be excavated for off-site disposal. Once the UST abandonments (or removals) have been completed, a request for closure of LUSTCASE # 2018010 will need to be submitted to DOEE.
55-gallon drums of unidentified waste	The contents of the drums were characterized for disposal and transported off-site for disposal during the 2018 Phase II ESA.	Yes	None
Presence of ACMs, LBP, PCBs, and other potentially hazardous materials in the vacant buildings.	No change.	No	All hazardous materials including ACMs and LBP will be properly assessed and remediated prior to demolition of buildings or building renovations.

An additional Phase II ESA was completed by Chesapeake GeoSciences, Inc (CGS) in August 2018 at Buildings 46 and 76 within Zone A to investigate environmental conditions in these two areas, relative to the findings presented in the April 10, 2007 Phase II ESA Report generated by MACTEC, so that the need for additional investigation and/or corrective action, if any, can be determined and to inform prospective re-development bidders.

The following hydrogeologic observations were made during the 2018 Phase II ESA:

- The depth to the groundwater table in the five wells located at/near Building 46 ranged from 90.00 feet below grade (BG) to 106.73 feet BG. Calculated groundwater elevations in the wells ranged from 150.19 feet above mean sea level (AMSL) to 150.50 feet AMSL. The direction of groundwater flow is toward the south-southeast.
- A continuous perched silty sand and sand groundwater zone, as described by MACTEC in its April 10, 2007 Phase II ESA Report, is not present in the vicinity of Building 46. Occasional discontinuous wet zones were present in the clayey unit in some of the borings advanced at Building 46. The occasional discontinuous wet zones observed in the clayey unit generally occurred in layers that were more permeable (i.e., higher sand content) or where the clayey matrix was less compact. The sandy unit, beneath the clayey unit, was dry to damp until the groundwater table was reached.

The following contaminant site characterization observations are quoted from the August 2018 Phase II ESA report:

Building 46 Contaminant Site Characterization Summary

- The USTs, located immediately south of Building 46A, were determined to have a capacity of 275-gallons each and were found to extend beneath a retaining wall. A DC licensed structural engineer concluded that the USTs could not be safely removed, because the foundation of the retaining wall will be undermined and that the tanks should be abandoned in place.
- The results of soil, subsurface vapor, and groundwater sampling identified a limited number of areas that may be of concern at Building 46.
    - Polycyclic aromatic hydrocarbons (PAHs) were detected in the tar base layer sample, that was obtained immediately below the asphalt roadway located adjacent to the western side of Building 46, at concentrations that exceeded the RBSLs. It was determined that the naphthalene detected in soil by MACTEC was from this tar base layer and not related to the former dry-cleaning operations. The PAHs do not present a concern for the direct contact exposure pathways if this layer remains covered by asphalt and do not appear to present a concern for the vapor intrusion/indoor inhalation exposure pathway due to their presence with a limited thickness adjacent to one side of the building (as opposed to a widespread beneath the building).
    - Stoddard solvent range hydrocarbons with seven to 12 carbon atoms (TPH-C7-C12) and PCE were detected in soil samples collected from some of the soil borings. PCE was detected in subsurface vapor samples collected from the vapor monitoring points (VMPs). The patterns of the detections suggest releases from the wastewater discharge piping and the sanitary sewer line, as opposed to a release from the USTs, as the more likely source of the TPH-C7-C12 and PCE detections that exceeded the RBSLs.
    - Detections in soil that exceeded the RBSLs were limited SB-10 (7'). These detections do not present a concern for the direct contact exposure pathways if this soil remains buried. Because the TPH-C7-C12 concentration exceeds DOEE's Tier 0 Standard, this soil, if excavated, will need to be transported for off-site disposal. Given the limited extent of soil that exceeds the RBSLs, these concentrations do not appear to present a concern for the vapor intrusion/indoor inhalation exposure pathway.
    - Detections in subsurface vapor that exceeded the RBSLs were reported in samples collected from VMP-01 and VMP-06. CGS understands that Building 46 will be repurposed as part of the re-development. These concentrations may present a concern for the vapor intrusion/indoor inhalation exposure pathway if the first floor of this building is re-developed for commercial or residential use. A vapor intrusion mitigation system may be necessary for the re-purposed space.

- No dry-cleaning related analytes (TPH-C7-C12, PCE, or PCE degradation products) were detected in the groundwater samples at concentrations that exceeded the RBSLs used in their evaluation.
- Benzene and naphthalene, not associated with dry cleaning operations, were detected in the groundwater sample collected from W46-3 at concentrations that exceeded the RBSLs. The source of these analytes is unknown; however, these analytes do not present a concern for the domestic use of groundwater exposure pathways given that drinking water is municipally supplied to AFRH and the surrounding areas nor do they present a concern for the vapor intrusion/indoor inhalation exposure pathway given the depth of this sample and the limited extent of the detections.

Building 76 Contaminant Site Characterization Summary

- Ten soil borings were advanced at Building 76. A total of 37 soil samples were obtained from the borings at varying depths and analyzed for TPH-diesel range organics (TPH-DRO) and TPH-oil range organics (TPH -ORO). TPH-DRO and TPH-ORO were detected in soil from seven of the borings at concentrations that exceed DOEE's Tier 0 Standard. TPH-DRO was detected in subsurface soil from five of the borings at concentrations that exceed DOEE's residential subsurface soil Tier 1 risk-based screening level (RBSL). The vertical extent of the TPH-DRO and TPH-ORO impact to the soil has been defined. However, the lateral extent of the TPH-DRO and TPH-ORO impact to the soil has not yet been defined.
- Demolition of Building 76 is planned as part of the re-development. Any soil, with TPH-DRO and TPH-ORO concentration that exceed the Tier 0 Standard and that is excavated, will need to be transported for off-site disposal. The TPH-DRO concentrations detected in subsurface soil at five of the borings may present a concern for the vapor intrusion/indoor inhalation exposure pathway if this area is re-developed for residential use and this soil is not removed. In this case, the new residential building(s) in this area may need to be constructed with a vapor barrier to mitigate vapor intrusion.

The August 2018 Phase II ESA report was reviewed by DOEE in September 2018. DOEE issued the following comments.

Building 46:

- Since PCE concentrations exceeded [its] VISL [vapor intrusion screening level] in the sub-slab soil vapor samples, DOEE requires the following measures for the future repurposed building:
  - Install active depressurized technology (ADT) to mitigate the soil vapor intrusion into the building. A sub-slab depressurization (SSD) system is a common type of ADT. The ADT design should be signed by PE. For additional details for vapor mitigation system, refer to EPA Guidance document for additional details "Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air" dated June 2015.
  - Install permanent sub-slab soil vapor points for future soil vapor monitoring.
- As a part of subsurface investigation, collect additional sub-slab soil vapor samples to the north and east of VMP-01 and VMP-06 to delineate the soil vapor exceedances.

- After considering the location of the UST especially the proximity to the tunnel, the UST Branch doesn't have a problem granting the variance the closure in-place. But due to the fact that a decision has not been made as to how long before the abandonment will take place, we cannot not grant the abandonment in-place at this time because the approval is time sensitive.

  It is therefore recommended that AFRH put the UST in temporary closure, usually for one year, after which you either remove the tank or abandon it in-place. However, you can request an extension for another one year should you need additional time to reach a decision. Putting the UST in temporary closure requires that you empty it of all products, clean the tank and maintain leak detection and financial responsibility.

Building 76:

- Collect additional soil samples for horizontal delineation of TPH-DRO concentrations in soil in all directions.

3.9.1 Impacts to Environmental Contamination

3.9.1.1 Alternative 1: No Action Alternative

Under the No Action Alternative, the action proposed in this SEIS will not be taken. AFRH-W will remain under Federal ownership and no new construction will occur. Opportunities to raise revenue will be limited to the reuse of existing buildings. An Operation and Maintenance 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 will be conducted as necessary. Therefore, no direct, indirect or cumulative impacts will occur.

3.9.1.2 Alternative 2: Master Plan Amendment 1 and Alternative 3: Master Plan Amendment 2

Several hazardous materials/hazardous waste issues were identified and assessed during the Phase I ESA conducted by Stantec and the most recent Phase II ESA conducted by CGS. Environmental contamination issues will need to be resolved prior to implementation of any of Alternatives 2 and 3, as described in Mitigation Measures below. The removal of hazardous waste and contaminants in the buildings and on the site will have a direct, long-term, minor, beneficial impact.

Mitigation Measures

The following actions listed below were recommended in accordance with the Phase I ESA conducted by Stantec and the results of the August 2018 Phase II ESA conducted by CGS, and will be undertaken by AFRH and/or AFRH Partners:

- Should AFRH Partners opt to remove the asphalt roadway and tar base layer located adjacent to the western side of Building 46, this material will be taken off-site to an asphalt recycling facility.
- The existing groundwater monitoring wells at the site should be abandoned by a licensed driller following DOEE notification and District of Columbia Department of Consumer and Regulatory Affairs (DCRA) permitting. These wells include the five wells installed by ABB Environmental Services, Inc. in 1990 (four of which have been found), the six wells installed by MACTEC in 2006

(most notably dry well W46-1), and the three wells installed by CGS. If the need for any of the wells installed by ABB Environmental Services, Inc. in 1990 continues, it is recommended that new surface covers be installed at these locations.

- If abandoned UST's at Building 46 are not abandoned in place as expected, soils excavated for the UST removal will need to be transported for off-site disposal.
- Should the potential need for vapor intrusion mitigation exist, based on the re-development plans for Building 46 (i.e., the first floor of Building 46 will be utilized as occupied space), it is recommended that, in addition to installation and sampling of new VMPs consistent with DOEE's requirement to delineate the extent of impact, existing VMPs (minimally VMP-01 and VMP-06) be re-sampled along with indoor air sampling to confirm the results of CGS' single sampling event before pilot testing/design of a vapor intrusion mitigation system is initiated. If additional VMPs are to be installed, a Work Plan will be developed for DOEE review. DOEE should be consulted to determine whether a DCRA permit will need to be obtained for the mitigation system.
- In the event that the re-development plans for Building 46 do not include use of the first floor of Building 46 as occupied space or that the results of expanded sampling/re-sampling do not confirm the prior results, conversations will be held with DOEE to discuss its requirements for a mitigation system. Any VMPs, that will no longer be needed, and as approved by DOEE, be abandoned.
- Additional horizontal delineation of the TPH-DRO contamination in soil should be conducted. In addition to fulfilling DOEE's requirement, this information will be needed by AFRH Partners if any subsurface excavation is planned in this area (for building footers, etc.) to determine the volume of soil that will require off-site disposal. If AFRH Partners plans a subsurface structure for this area (i.e., sub-grade parking garage or basement), and pending DOEE approval, this information could be obtained while excavation for the structure is being performed. Otherwise, this information should be obtained via soil borings. If this information is to be obtained via soil borings, a Work Plan will be developed for DOEE review, and a DCRA permit should be obtained.
- Depending on the re-development plans for Building 76 and whether soil (that may present a potential vapor intrusion concern) is removed, any planned new residential building(s) in this area may need to be constructed with a vapor barrier to mitigate vapor intrusion.
- Once DOEE's requirements for this area have been met, a request for closure of LUSTCASE # 2018011 will need to be submitted to DOEE.
- Removal of both USTs will be verified by excavation, geophysical methods and/or further records review. After verification of UST removal, a limited contamination assessment will be conducted in the areas of the former USTs to include collection of soil and groundwater samples for analysis of TPH-DRO.
- Once the redevelopment plans for this area have been determined, the procedure to permanently close the USTs will be initiated. The closure process includes DOEE notification, DCRA permitting, removal or abandonment by a licensed UST contractor, and follow-up

reporting. If the USTs are removed, it is recommended that the soil at SB-10 (7') also be excavated for off-site disposal.

- Once the UST abandonments (or removals) have been completed, a request for closure of LUSTCASE # 2018010 will need to be submitted to DOEE.
- All hazardous materials including ACMs and LBP will be properly assessed and remediated prior to demolition of buildings or building renovations.

3.10 Unavoidable Adverse Impacts

Unavoidable adverse impacts of the proposed action will include, short-term temporary impacts, such as noise, air emissions, and occasional traffic congestion associated with construction activities. Unavoidable, long-term adverse effects will 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 will be addressed in compliance with state, local, and Federal regulations.

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

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

Short-term gains to the local economy will 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.

3.12 Irreversible or Irretrievable Commitment of Resources

The proposed action will require the commitment of land for construction of new buildings within AFRH-W. The total commitment will 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 will be permanent.

A commitment of fuel and energy will be required to construct new buildings. Other resource commitments during the construction period will include construction materials and labor. There will 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.

3.13 Summary of Proposed Mitigation Measures under the Preferred Alternative (Master Plan Amendment 2)

Stormwater Management

- Low-impact development techniques will 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).

Air Quality

BMPs outlined in the District's regulations during construction will be implemented to ensure there will be minimal temporary construction-related adverse impacts.

Land Use Planning and Zoning

No mitigation measures proposed.

Transportation

Traffic Mitigation

The following will be constructed by Phase I of the proposed development

Irving Street NW and First Street NW:

- Extension of First Street NW northward from the Irving Street NW and First Street NW intersection to serve as the gateway access for the site with inbound and outbound access available between Parcel C and Parcel E.
- Addition of a northbound-thru lane along First Street NW into the site.
- Addition of an eastbound left-turn lane along Irving Street NW into the site.
- Signal modification to accommodate site access.

North Capitol Street and Allison Street NE/Hawaii Avenue NE:

- Curb extensions w/flex posts and white and tan pavement markings at the western corners of North Capitol Street and Allison Street NW.
- Curb extension w/flex posts and white and tan pavement markings at the northeast corner of North Capitol Street and Allison Street NE.
- Large curb extension w/flex posts and white and tan pavement markings at the southwest corner of North Capitol Street and Allison Street NE.
- Curb extensions to provide 10-foot clearance between crosswalks and parking zones on Allison Street.

North Capitol Street and Rock Creek Church Road NW/Buchanan Street NE:

- Stripe extension of existing painted curb lane buffer to north of Buchanan Street.
- Upgrade crosswalk across North Capitol Street to a high visibility crosswalk.

- In addition to physical roadway improvements, transportation demand management (TDM) measures are recommended to be implemented onsite to reduce single-occupancy vehicle trips. The site developer will work with DDOT to establish a plan that outlines measures that will be applied onsite. These measures will be applied as appropriate for each development phase.
- Upon completion of the urbanization of the cloverleaf and North Capitol Street corridor, the developer will provide the following additional access to the site:
  - One additional connection to North Capitol Street, north of the boiler plant.
  - One additional connection to North Capitol Street between Parcel F and Parcel P, consistent with the connection shown in the 2021 DDOT North Capitol Cloverleaf Urbanization Study.
  - One additional connection to Irving Street NW between Parcels E and F, consistent with the connection shown in the 2021 DDOT North Capitol Cloverleaf Urbanization Study.

Transit Mitigation

- Coordinate with WMATA to evaluate the potential for enhanced connections to the Columbia Heights and Brookland-CUA Metrorail stations by providing a circulator route that provides service to the AFRH-W site, as well as the hospital center, and other nearby developments.
- Continue coordination with WMATA and DDOT regarding future transit services, as well as bringing existing and future transit services onto the AFRH-W site.
- Constructing an on-site transit center that includes a climate-controlled waiting area with rider amenities, such as restrooms.

Pedestrian Facilities

Internal Improvements:

- 15-foot sidewalks with 5-foot tree/furnishing zones along both sides of Scale Gate Road NW from the pasture drive to the North Capitol Street ramps;
- An 8-foot sidewalk and a 10-foot multi-use path with a 6-foot tree/furnishing zone on one side and an 8-foot sidewalk with a 6-foot tree/furnishing zone on the other side of First Street NW from Irving Street NW to Pershing Drive NW;
- An 8-foot sidewalk and a 10-foot multi-use path with a 9-foot tree/furnishing zone on one side and a combined 19-foot sidewalk and tree/furnishing zone on the other side of Pershing and Eisenhower Drives NW;
- A 10-foot multi-use path with a 6.5-foot tree/furnishing zone on one side and a 6-foot sidewalk with a 7.5-foot tree/furnishing zone on the other side of proposed pasture drive;

- A 6-foot sidewalk with a 5.5-foot tree/furnishing zone on one side and a 5.5-foot sidewalk on the other side of internal neighborhood streets;
- A 14-foot sidewalk with a 16-foot tree/furnishing zone on one side and a 10-foot sidewalk with a 14-foot tree/furnishing zone on the street between Blocks E and F, prior to urbanization of the North Capitol Street cloverleaf;
- Upon urbanization of the North Capitol Street cloverleaf, this internal roadway segment between Blocks E and F will be reconstructed to have a 10-foot sidewalk alongside a 2-foot buffer and 10-foot multi-use path with a 6-foot tree/furnishing zone on one side and an 8-foot sidewalk with a 14-foot tree/furnishing zone on the other side;
- A 6-foot sidewalk with a 5.5-foot tree/furnishing zone on one side and an 8-foot sidewalk with a 5-foot tree/furnishing zone on the other side of Arnold Drive NW between Irving Street NW and Pershing Drive NW;
- An 8-foot sidewalk with a 5-foot tree furnishing zone along the west side of Block H south of the Boiler Plant; and
- A two-lane, curbless street connecting Block H to the Boiler Plant, providing a shared facility to be used by all road users.
- A multi-use path will be constructed along the north side of Irving Street NW from the east-most non-vehicular access between Blocks E and F to the west-most vehicular access at the existing Arnold Drive NW.
- Bikeshare and micromobility parking as follows:
    - Phase 1: One 19-dock Capital Bikeshare station on-site
    - Phase 2: One 8-bay micromobility parking and charging station
    - Phase 3: One 19-dock Captial Bikeshare station on-site, and one 8-bay micromobility parking and charging station
    - Phase 4: One 19-dock Capital Bikeshare station on-site, and one 19-dock Capital Bikeshare station off-site

<u>External Improvements</u>

- A facility along the Irving Street frontage that extends west from the existing interchange to Park Place NW that consists of a 10-foot path with 6-foot tree boxes that extends from North Capitol Street to Park Place NW. This will be constructed in two phases:
    - Segment 1: Between Park Place NW and First Street NW to be completed by Phase 2.
    - Segment 2: Between Park Place NW and North Capitol Street to be completed by the end of Phase 4 or as part of DDOT's North Capitol Street/Cloverleaf urbanization project (no later than 2033).

- A 6-foot sidewalk with 4-foot green buffer along North Capitol Street between Scale Gate Road and Irving Street NW to be completed by the end of Phase 4 or as part of DDOT's North Capitol Street/Cloverleaf urbanization project (no later than 2033).
- One off-site 19-dock Capital Bikeshare station.

Environmental Contamination

The following actions listed below were recommended in accordance with the Phase I ESA conducted by Stantec and the results of the August 2018 Phase II ESA conducted by CGS, and will be undertaken by AFRH and/or AFRH Partners:

- Should AFRH Partners opt to remove the asphalt roadway and tar base layer located adjacent to the western side of Building 46, this material will be taken off-site to an asphalt recycling facility.
- The existing groundwater monitoring wells at the site should be abandoned by a licensed driller following DOEE notification and District of Columbia Department of Consumer and Regulatory Affairs (DCRA) permitting. These wells include the five wells installed by ABB Environmental Services, Inc. in 1990 (four of which have been found), the six wells installed by MACTEC in 2006 (most notably dry well W46-1), and the three wells installed by CGS. If the need for any of the wells installed by ABB Environmental Services, Inc. in 1990 continues, it is recommended that new surface covers be installed at these locations.
- If abandoned UST's at Building 46 are not abandoned in place as expected, soils excavated for the UST removal will need to be transported for off-site disposal.
- Should the potential need for vapor intrusion mitigation exist, based on the re-development plans for Building 46 (i.e., the first floor of Building 46 will be utilized as occupied space), it is recommended that, in addition to installation and sampling of new VMPs consistent with DOEE's requirement to delineate the extent of impact, existing VMPs (minimally VMP-01 and VMP-06) be re-sampled along with indoor air sampling to confirm the results of CGS' single sampling event before pilot testing/design of a vapor intrusion mitigation system is initiated. If additional VMPs are to be installed, a Work Plan will be developed for DOEE review. DOEE should be consulted to determine whether a DCRA permit will need to be obtained for the mitigation system.
- In the event that the re-development plans for Building 46 do not include use of the first floor of Building 46 as occupied space or that the results of expanded sampling/re-sampling do not confirm the prior results, conversations will be held with DOEE to discuss its requirements for a mitigation system. Any VMPs, that will no longer be needed, and as approved by DOEE, be abandoned.
- Additional horizontal delineation of the TPH-DRO contamination in soil should be conducted. In addition to fulfilling DOEE's requirement, this information will be needed by AFRH Partners if any subsurface excavation is planned in this area (for building footers, etc.) to determine the volume of soil that will require off-site disposal. If AFRH Partners plans a subsurface structure for this area (i.e., sub-grade parking garage or basement), and pending DOEE approval, this information could be obtained while excavation for the structure is being performed. Otherwise,

this information should be obtained via soil borings. If this information is to be obtained via soil borings, a Work Plan will be developed for DOEE review, and a DCRA permit should be obtained.

- Depending on the re-development plans for Building 76 and whether soil (that may present a potential vapor intrusion concern) is removed, any planned new residential building(s) in this area may need to be constructed with a vapor barrier to mitigate vapor intrusion.
- Once DOEE's requirements for this area have been met, a request for closure of LUSTCASE # 2018011 will need to be submitted to DOEE.
- Removal of both USTs will be verified by excavation, geophysical methods and/or further records review. After verification of UST removal, a limited contamination assessment will be conducted in the areas of the former USTs to include collection of soil and groundwater samples for analysis of TPH-DRO.
- Once the redevelopment plans for this area have been determined, the procedure to permanently close the USTs will be initiated. The closure process includes DOEE notification, DCRA permitting, removal or abandonment by a licensed UST contractor, and follow-up reporting. If the USTs are removed, it is recommended that the soil at SB-10 (7') also be excavated for off-site disposal.
- Once the UST abandonments (or removals) have been completed, a request for closure of LUSTCASE # 2018010 will need to be submitted to DOEE.
- All hazardous materials including ACMs and LBP will be properly assessed and remediated prior to demolition of buildings or building renovations.

4.0 Responses to Comments on Draft EIS

The Draft SEIS for the Master Plan Amendment 1 was released to the public and the Notice of Availability was published in the Federal Register on 11/24/2017. Written comments on the Draft SEIS were accepted until December 13, 2017, and are addressed herein. A Public Hearing was held on the Draft SEIS on January 8, 2018. Responses to individual comments can be found in Table 42.

Table 42. Responses to Comments on Draft EIS

Agency	Letter Dated	Comment	Response
National Capital Planning Commission	January 6, 2018	Request ongoing coordination	AFRH will continue to consult with NCPC as the Master Plan is implemented.
District of Columbia Office of Planning	January 12, 2018	Comments regarding Master Plan	The project team has coordinate with DCOP and DDOT since the publication of the Draft SEIS. Since that publication a new Comprehensive Transportation Review has been conducted. The project has coordinated with DDOT on the impacts and mitigation that will be required and that analysis is provided in Section 3.7
US DOI, Office of Environmental Policy and Compliance	January 16, 2018	Coordinate with Pamunkey Tribe	Pamunkey Tribe will be coordinated with.
District Department of Transportation	January 11, 2018	Comments on transportation Impacts	The project team has coordinate with DCOP and DDOT since the publication of the Draft SEIS. Since that publication a new Comprehensive Transportation Review has been conducted. The project has coordinated with DDOT on the impacts and mitigation that will be required and that analysis is provided in Section 3.7
US Environmental Protection Agency	January 12, 2018		
	Topics Dismissed from Further Analysis		
	Biological Resources	1.a	During the preparation of the SEIS, the existing habitat was revisited to see if there had been changes from 2007 Final EIS. There have been no significant changes to terrestrial habitat either on the AFRH-W site or off site since the 2007 Final EIS. The site is located in an urban, highly developed area. The largest parcels of open space in the area are Catholic University, the McMillan Reservoir, and AFRH-W. None of these properties have undergone development since 2007, and open spaces remain relatively unchanged. There will be no changes to the impacts described in the 2007 Final EIS, therefore, no additional analysis was warranted.

Agency	Letter Dated	Comment	Response
	Biological Resources	1.b	The selected developer will be required to follow the District of Columbia's 2001 Public Realm Design Manual regarding the treatment of street trees. As stated in the SEIS, the developer will be required to develop a Landscape Plan as part of the development approval process. Because part of the AFRH is considered a historic cultural landscape, any disturbance to trees within the cultural landscape will be handled in accordance with the Programmatic Agreement.
	Biological Resources	1.c	The Master Plan was developed considering natural resources and cultural landscapes. The Plan identifies the need to protect natural resources and calls for specific open spaces and trees to be preserved.
	Social Env/EJ	2.a	Impacts to low-income and minority populations were assessed in the 2007 Final EIS and that analysis found that implementation of the Master Plan will have beneficial impacts to low-income and minority persons through the increase in housing stock and commercial establishments, access to currently inaccessible open space/parks, and opportunities for employment. Impacts from air quality, noise and transportation will not affect low-income or minority populations disproportionately. This has not changed since issuance of the 2007 Final EIS.
	Social Env/EJ	2.b	The Master Plan includes publicly accessible open space, shopping, dining, hotel and residential uses that will be available to the community. In addition, the Master Plan calls for a pedestrian-friendly environment and an extensive network of bicycle paths connecting to adjacent neighborhoods.
	Cultural Resources	3	AFRH completed Section 106 review of the original Master Plan in 2008, which resulted in a signed Programmatic Agreement with DCSHPO, NCPC, NPS, and ACHP. The Programmatic Agreement includes mitigation actions that are required by both AFRH and any developer that undertakes development in Zone A. These mitigation actions, which are reflected in all relevant lease documents, are focused on the preservation, treatment, and maintenance of both built and landscape resources, as well as potential and known cultural resources and sites. The Programmatic Agreement was amended by all Signatories in 2015 to update Section 106 review procedures and other administrative information. AFRH continues to work directly with all Section 106 Consulting Parties and Signatories for amendments to the AFRH-W Master Plan as stipulated in the Programmatic Agreement.
	Air Quality	4	The air quality analysis has been updated in the Final SEIS

Agency	Letter Dated	Comment	Response
	Utilities	5.a – Combined Sewers	The approved 2008 Master Plan requires new development on the site to include stormwater management in accordance with DC regulations which will reduce the burden on the combined sewer system. In addition, the Master Plan calls for water conservation measures including rainwater collection systems, natural irrigation, greywater recycling, and green roofs. The selected developer will be responsible for implementing these measures. In addition, DC Water is currently constructing the Northeast Boundary Tunnel which will collect, convey, and store combined sewer overflows (CSOs) and provide relief to chronic flood areas within the Northeast Boundary area of the District. AFRH-W is located within the Northeast Boundary area.
		5.b – Responsible Parties	AFRH-W is responsible for utility upgrades within the AFRH Zone. The selected developer will be responsible for utility upgrades within Zone A. All utility upgrades will be permitted through the District of Columbia. The site will be developed in phases over time, but the full phasing is not yet known.
	Topics Retained for Further Analysis		
	Stormwater Management	1	The approved Master Plan is consistent with Section 438 of the Energy Independence and Security Act of 2007. The Master Plan calls for sustainable practices including rainwater collection systems, natural irrigation, greywater recycling, and green roofs.
	Transportation	2.a	Noted. Coordination with DDOT has been ongoing. WMATA and DDOT coordination will be continued once a developer is selected and a final site and phasing plan is developed.
		2.b	The mitigation measures included in the SEIS were vetted through DDOT's Comprehensive Transportation Review process. The selected developer will re-engage with DDOT to refine the CTR based on the final site plan and phasing plan. All mitigation measures will be refined, programmed, and approved by DDOT at that time.
	General Comments		
		1.a Purpose and Need	GSA and its project team have conducted a market survey and have determined what the market can handle by product type specifically for this development.

Agency	Letter Dated	Comment	Response
		1.b	As noted in the SEIS, expenditures for the AFRH have continually increased as operating costs have risen and the Home's infrastructure has aged. The income received from active duty military has not and will not keep pace with the level of expenditures needed to maintain and operate the Home. It is because of this short-fall that Congress passed legislation granting AFRH leasing authority under U.S.C Title 24 §411. In addition, AFRH and GSA conducted a detailed financial analysis. There is currently an approximate $22M financial gap for the latest fiscal year and this will continue in the future.
		2. Project Description	Project description will be updated for clarity
		3. Heating Plant Information	The Heating Plant was decommissioned in 2013 and will not be reused as a Heating Plant. Under the proposed action, the Heating Plant will be adaptively reused for office, commercial or residential space.
		4. Indirect and Cumulative Impacts	Additional information will be added to cumulative impacts regarding regional development.
		5. Next Steps	Text has been updated to reflect which environmental impacts were analyzed in the Final EIS.

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Appendix A Transportation Analysis

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