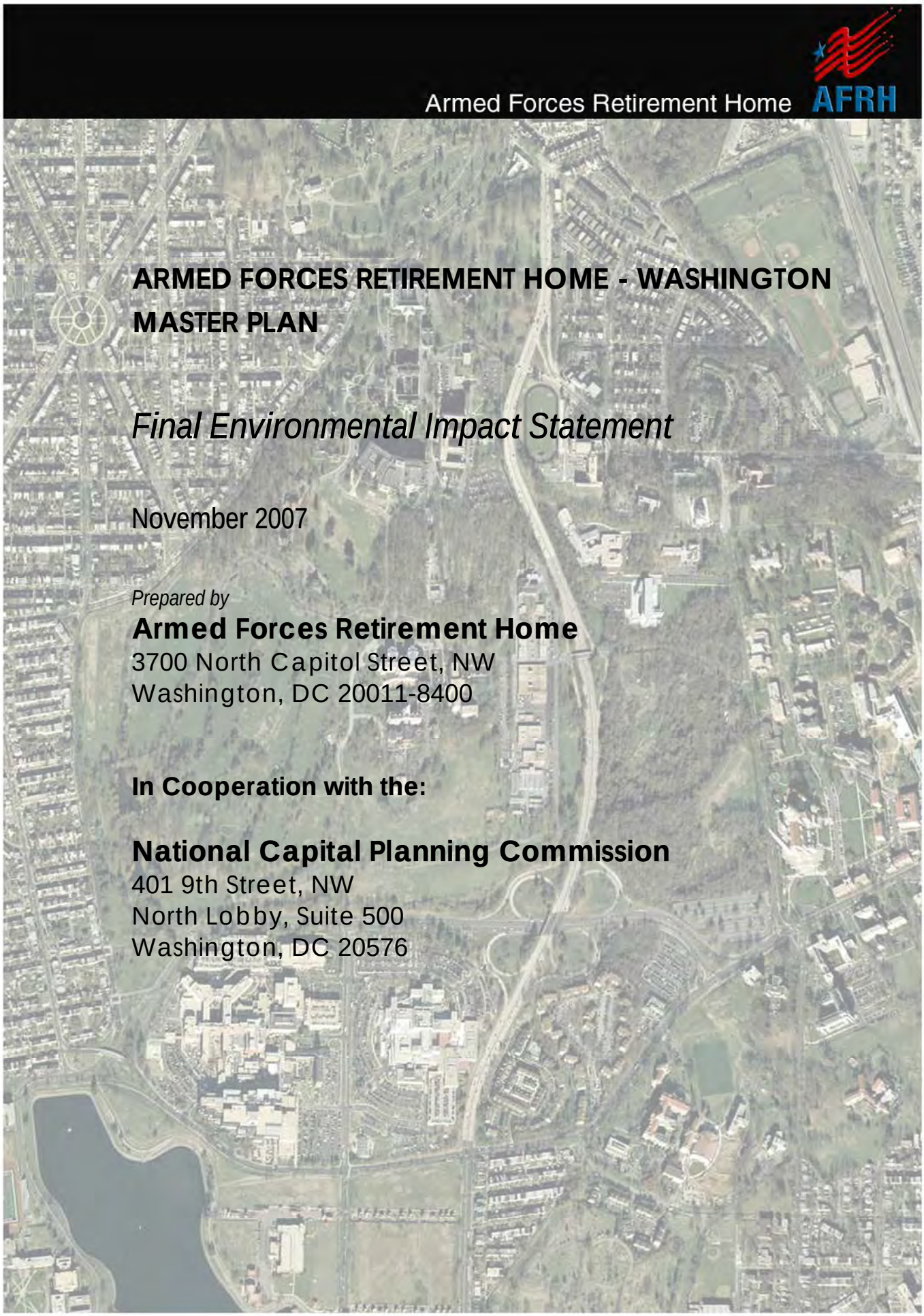

ARMED FORCES RETIREMENT HOME - WASHINGTON MASTER PLAN

Final Environmental Impact Statement

November 2007

Prepared by

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

In Cooperation with the:

National Capital Planning Commission
401 9th Street, NW
North Lobby, Suite 500
Washington, DC 20576

Final Environmental Impact Statement

Responsible Agency:

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

In Cooperation with the:

National Capital Planning Commission
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Washington, DC 20576

The Armed Forces Retirement Home (AFRH) is preparing an Environmental Impact Statement (EIS) to analyze the potential impacts from the proposed Master Plan for its campus located at 3700 North Capitol Street, NW, in Washington, DC (AFRH-W). The No Action (no build) Alternative and the Master Plan Alternatives for the proposed action at AFRH-W are studied in detail in the Environmental Impact Statement.

Questions or comments on the Final Environmental Impact Statement should be addressed to:

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Executive Summary

The Final Environmental Impact Statement (Final EIS) has been prepared pursuant to:

- The National Environmental Policy Act of 1969 (NEPA)
- Council on Environmental Quality (CEQ) regulations for implementing NEPA contained in 40 Code of Federal Regulations (CFR) Parts 1500 to 1508

ES.1 Proposed Action

The purpose of the proposed action is to create a Master Plan for the Armed Forces Retirement Home–Washington (AFRH-W) that will sustain AFRH-W and its primary source of funding, AFRH Trust Fund. Several alternatives have been prepared for AFRH-W Master Plan. Potential development under each alternative was defined after taking into consideration compatibility with AFRH mission, compatibility with historic resources and existing environmental conditions, compatibility with surrounding land uses, and analysis of real estate market conditions in the area. Private or governmental development on AFRH-W would occur primarily through leases or sales. The decision to lease or sell will be made based on economic analysis, and is not part of this EIS.

Currently, AFRH's fixed income sources are insufficient to fund campus operations and improvements. AFRH does not receive an annual appropriation to fund its operations. For the past 155 years, AFRH has financed its operations through interest from its Trust Fund established with funds provided by Congress. The Trust Fund is capitalized through resident fees (limited by law at 35 percent of a resident's income of which fewer than half pay the maximum); 50 cent paycheck contributions from active duty enlisted military personnel; fines and forfeitures by the military (which historically are higher during time of war); and interest on the Trust Fund (law restricts investments to US Treasury Bills) and other smaller investments.

While expenses at AFRH have increased over time and the existing buildings have aged requiring more upkeep, contributions to the Trust Fund have not risen commensurately and expenses have outstripped income. In order to improve AFRH's financial situation, steps were taken at AFRH to reduce expenditures over the last several years.

However, AFRH-W still needs to generate reliable sources of revenue to support the Trust Fund and ensure a sustainable retirement home. AFRH faces $366 M in deferred maintenance/required capital improvement projects which will require funding over the next ten

years. Furthermore, AFRH must prepare to meet the needs of the next generation of enlisted personnel who are living longer with chronic medical conditions and who will have special housing and medical needs as they age.

Therefore, to supplement the Trust Fund and ensure the financial stability of AFRH for future generations of retired military personnel, the National Defense Authorization Act for Fiscal Year 2002 (107 P.L. 107, 24 U.S.C. § 401, *et seq*.) authorized AFRH, with the approval of the Secretary of Defense, to sell or lease its real estate holdings. AFRH intends to take advantage of the authority provided by this legislation and leverage the value of its real estate by selling or leasing land that is in excess of its needs. AFRH began to implement its financial strategy in 2004 by initiating development studies to determine the best approach for making land available for sale or for development under long-term leases to achieve its financial goals.

The objectives of AFRH-W Master Plan are to:

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

ES.2 Alternatives

Alternative 1 – No Action Alternative

Under the No Action Alternative, the action proposed in this EIS would not be taken. AFRH-W would remain under Federal ownership, with AFRH as the holding agency. No new construction would occur on AFRH-W under this alternative. The site would continue to be underdeveloped, with scattered, unused, and mostly non-revenue producing buildings. The facility would remain fenced and guarded, with entry from Rock Creek Church Road and North Capitol Street restricted to those with business on site. The No Action Alternative does not support the intent

of the Armed Forces Retirement Home Act of 1991, as amended (24 U.S.C. §401 et seq.), which allows AFRH to sell, lease, or otherwise dispose of, land determined excess to the needs of AFRH as a means to replenish AFRH Trust Fund.

Alternative 2

Under Alternative 2 (see Page 2-6, Figure 2-2), AFRH-W would be developed to accommodate the following: 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.

	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**

Development zones on AFRH-W would include the following:

- the AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within these Zones.
- Zone A1 is designated for educational use.
- Zones A2 and B would be developed with medical uses compatible with the Washington Hospital Center development south of Irving Street.
- Zone B would contain residential development compatible with the residential development west of Rock Creek Church Road. This zone would also potentially include retail development to serve the residential areas.

– Zone C would contain residential development compatible with the residential development west of Rock Creek Church Road. This zone would also potentially include retail development to serve the residential areas.

Alternatives 3A, 3B, and 3C

Under Alternatives 3A, 3B, and 3C (see Page 2-11, Figure 2-3), AFRH-W would be developed to accommodate the following:

	Gross Square Footage		
	Alternative 3A	**Alternative 3B**	**Alternative 3C**
Institutional	350,000	350,000	350,000
Residential	4,018,234	4,781,819	4,189,331
Hotel/Conference Center	123,026	220,000	200,000
Retail	243,562	241,735	470,763
Medical	240,974	250,000	0
Office/Research and Development	1,383,573	692,000	1,688,600
TOTAL	**6,459,369**	**6,635,554**	**6,898,694**

Development zones on AFRH-W would include the following:

– the AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within this Zone. In addition, several holes on the golf course would be relocated. All alterations to the golf course would occur within the footprint of the current golf course (see Figure 2-4).

– Zone A is designated for residential, office/research and development, retail, hotel, and medical uses.

– Zones B and C are designated for residential development which would take place at a later time.

Alternative 4

Under Alternative 4 (see Page 2-15, Figure 2-4), AFRH-W would be developed to accommodate the following:

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

Development zones on AFRH-W would include the following:

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

ES.3 Impacts

AFRH analyzed potential direct, indirect, and cumulative impacts associated with each of the alternatives under consideration.

Impacts on Natural Resources

No Action

No impacts to natural resources would occur.

Proposed Action

Master Plan Alternatives

- Direct, long-term, moderate, adverse impacts to topography and soils would occur from clearing, grading, and construction activities.

- No direct impacts to water resources would occur. Increases in impervious surfaces would have indirect, long-term, moderate, adverse impacts on water quality. Channelized streams on AFRH-W may need to be relocated resulting in a direct, long-term, minor, adverse impact. Installation of new stormwater management controls would result in an improvement in stormwater quantity and quality leaving the site. An indirect, long-term, minor, adverse impact on the quality of stormwater runoff would occur.

- Implementation of the Master Plan Alternatives could require removal of mature trees and construction within open space/meadows resulting in a direct, long-term, moderate, adverse impact on terrestrial biota. Increases in impervious surfaces would have indirect, long-term, minor, adverse impacts on aquatic biota.

Impacts on Social Environment

No Action

- There would be a direct, long-term, major adverse effect on AFRH revenues as the Trust Fund is used for AFRH needs and no other additional revenues would be generated to support AFRH.

- As a result of insufficient funding, the number of employees would potentially be reduced, services offered to residents of AFRH-W would be reduced, and capital improvements for new services or to repair aging buildings would not be feasible creating indirect, long-term, major, adverse impacts to economy and employment.

- No impacts to housing, employment, environmental justice and community facilities would occur.

Proposed Action

Master Plan Alternatives

- The Master Plan Alternatives would add between 992,000 and 4,967,000 gsf of new residential space and between 1,538 and 7,500 new residents resulting in a direct, long-term, moderate, beneficial impact to the local housing stock and population.

- Low income and minority populations would not be disproportionately affected by impacts of the Master Plan Alternatives.

- Additional residential development would require increased services from the DC Public Schools resulting in a direct, long-term, minor, adverse impact. All new development would require emergency services from the DC Metropolitan Police Department and the DC Fire Department resulting in a direct, long-term, minor, adverse impact. There would also be a beneficial impact on Fire Protection due to the new and renovated up-to-code buildings as well as new fire protection devices on site. Community services such as libraries, social services organizations, community organizations, and churches would likely benefit from the increase in tax base and local population. The number of mail carriers may increase depending on the number of cluster boxes on the site. Therefore, impacts to the U.S. Postal Service are expected to be direct, long-term, minor and adverse. Under the preferred alternative, Alternative 3A, there will be direct, long-term, major beneficial impacts to the public through the creation of publicly accessible bicycle paths, pedestrian paths, two pocket parks, two large open meadows, and a green buffer around the entire perimeter of Zone A.

- The proposed development would be consistent with the Federal and DC Elements of the *Comprehensive Plan for the National Capital.* In some areas, the Master Plan Alternatives would result in a change in land use from open space to residential and commercial development resulting in a direct, long-term, major adverse impact. In addition, the Master Plan Alternatives would act as a catalyst for future development in the area and would have an indirect, long-term, minor, beneficial impact.

- Construction would have a direct, short-term, minor, beneficial impact from the employment of construction workers and expenditures for construction materials. Long-term, moderate, beneficial impacts would occur from expenditures by new businesses

and employees occupying the new development. In addition, a direct, long-term, minor, beneficial impact from the creation of jobs would occur.

- Implementation of the Master Plan Alternatives would have a long-term, major, beneficial impact on AFRH Trust Fund revenues.
- There would be a moderate, long-term, beneficial impact to the District of Columbia from tax revenues on private development on AFRH-W.

Impacts on Cultural Resources

No Action

- Historic buildings that are currently underutilized may deteriorate over time resulting in an indirect, long-term, moderate, adverse impact to historic resources.

Proposed Action

Master Plan Alternatives

- There could be a direct, long-term, minor to moderate adverse impact on archeological resources from the implementation of the Master Plan Alternatives.
- The Master Plan Alternatives could change the settings and views of and therefore have indirect, long-term, moderate adverse impacts to resources listed on or eligible for listing on the National Register of Historic Places.
- The Master Plan Alternatives could have direct, long-term, major, adverse impacts to the historic cultural landscape on AFRH-W.
- Reuse of historic buildings could have a direct, long-term, moderate, beneficial impact.
- A direct, long-term, major, adverse impact on the historic district would occur.

Impacts on Transportation

No Action

No new impacts would occur.

Proposed Action

Master Plan Alternatives

- The Master Plan Alternatives would result in a direct, long-term, major, adverse impact on traffic levels in the area. Intersections at North Capitol Street/Michigan Avenue, North Capitol Street/Harewood Road, and Irving Street/1st Street/ Site Access would fail under Alternative 2. Intersections at North Capitol Street/Harewood Road and Irving Street/1st Street/Site Access would fail under Alternatives 3A/3B and 4.

Impacts on Air Quality

No Action

- No new impacts would occur.

Proposed Action

Master Plan Alternatives

- Construction activities would result in short-term, minor, adverse impacts to air quality.
- Traffic increases would result in direct, long-term, minor, adverse impacts to air quality. Stationery sources would result in direct, long-term, major, adverse impacts to regional air quality.

Impacts on Noise

No Action

- No new noise impacts would occur.

Proposed Action

Master Plan Alternatives

- Construction activities would result in direct, short-term, moderate, adverse impacts to noise levels.
- Traffic increases would result in a direct, long-term, negligible, adverse affect on noise levels.

Impacts on Utilities

No Action

- No new impacts would occur.

Proposed Action

Master Plan Alternatives

- Direct, long-term, minor, adverse impacts on utility capacity would occur. Solid and medical/lab waste would be handled in accordance with DC regulations.

Impacts on Environmental Contamination

No Action

No new impacts would occur.

Proposed Action

Master Plan Alternatives

- The removal of hazardous waste and contaminants in the buildings on the site would have a direct, long-term, minor, beneficial impact.

Table of Contents

Section **Page Number**

List of Tables

List of Tables (continued)

List of Figures

List of Figures (continued)

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1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The Armed Forces Retirement Home (AFRH) is preparing an Environmental Impact Statement (EIS) to analyze the potential impacts from the proposed Master Plan for its campus located at 3700 North Capitol Street, NW, in Washington, DC and known as AFRH-W (See Figure 1-1, Regional Location Map).

1.2 Purpose of the Proposed Action

The purpose of the proposed action is to create a Master Plan for AFRH-W that will sustain AFRH and its primary source of funding, AFRH Trust Fund.

1.3 Need for the Proposed Action

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

Currently, AFRH's fixed income sources are insufficient to fund campus operations and improvements. AFRH does not receive an annual appropriation to fund its operations. For the past 155 years, AFRH has financed its operations with income from its Trust Fund established with funds provided by Congress. The Trust Fund is capitalized through resident fees (limited by law at 35 percent of a resident's income of which fewer than half pay the maximum); 50 cent paycheck contributions from active duty enlisted military personnel; fines and forfeitures by the military (which historically are higher during time of war); and interest on the Trust Fund (law restricts investments to US Treasury Bills) and other smaller investments.

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

While expenses at AFRH have increased over time and the existing buildings have aged, requiring more upkeep, contributions to the Trust Fund have not risen commensurately. Income decreased between 2004 to 2006 from $92 million to $69 million Due to expenses outstripping income, the value of AFRH Trust Fund dropped 40 percent in the eight years from 1995 – 2003 to $94 million.

In order to improve AFRH's financial situation, the following steps were taken at AFRH: employment was cut from 736 to 299 employees by the end of Fiscal Year 2006, old buildings were mothballed or leased, the two campuses were brought under single management (which achieved a 20 to 30 percent cost savings in Fiscal Year 2005), administrative chores were outsourced and performance based contracts were let for transportation and trash removal, ground and facility maintenance, security and dining services. In 2004, AFRH embraced the tenets of the President's Management Agenda (PMA) as a means to reduce costs and conduct more efficient operations. These steps, among others, helped restore the Trust Fund to $146 million by the close of 2006. In addition, in 2004, the Trust Fund received a one-time $22 million infusion of cash from the sale of a piece of land to Catholic University. While these innovations helped, AFRH-W cannot continue to sell off pieces of its legacy and cost saving measures alone cannot generate the funds needed to pay for new buildings and major renovations which are needed to guarantee a safe and secure home and high quality medical services for future generations of American heroes.

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

AFRH-W needs to generate reliable sources of revenue to support the Trust Fund and ensure a sustainable retirement home. AFRH faces $366 M in deferred maintenance/required capital improvement projects which will require funding over the next ten years. Furthermore, AFRH must prepare to meet the needs of the next generation of enlisted personnel who are living longer with chronic medical conditions and who will have special housing and medical needs as they age.

Therefore, to supplement the Trust Fund and ensure the financial stability of AFRH for future generations of retired military personnel, the National Defense Authorization Act for Fiscal Year 2002 (107 P.L. 107, 24 U.S.C. § 401, *et seq*.) authorized AFRH, with the approval of the Secretary of Defense, to sell or lease its real estate holdings. AFRH intends to take advantage of the authority provided by this legislation and leverage the value of its real estate by selling or leasing land that is unutilized. AFRH began to implement its financial strategy in 2004 by initiating development studies to determine the best approach for making land available for sale or for development under long-term leases to achieve its financial goals.

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

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

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

The magnitude of AFRH's immediate capital requirements ($366 million), projected future capital needs for new facilities, and the recent availability of special land sales/lease authority to benefit the AFRH Trust Fund (24 USC 411(e)(3)) has led AFRH to focus on a range of land development alternatives to meet its need. AFRH has never had direct Congressional appropriations, and has been directed by Congress and the Department of Defense to manage its Trust Fund and operate as a self-sufficient non-appropriated agency. It is highly unlikely that AFRH will become an appropriated agency, especially given the magnitude of funding required for its capital program, existing budget deficits, and current military spending priorities. AFRH has in the past sought legislation that would incrementally increase returns on its Trust Fund by allowing AFRH to invest in vehicles other than Treasury bills, as it is currently limited to, but no legislation of this type has been passed; even if it were, returns would not likely be sufficient to meet AFRH's immediate capital requirements. In addition, even if AFRH were to receive additional funding, a Master Plan would still be needed to guide development on AFRH-W. For these reasons, AFRH's need is best met by considering the land development alternatives and developing a Master Plan for AFRH-W.

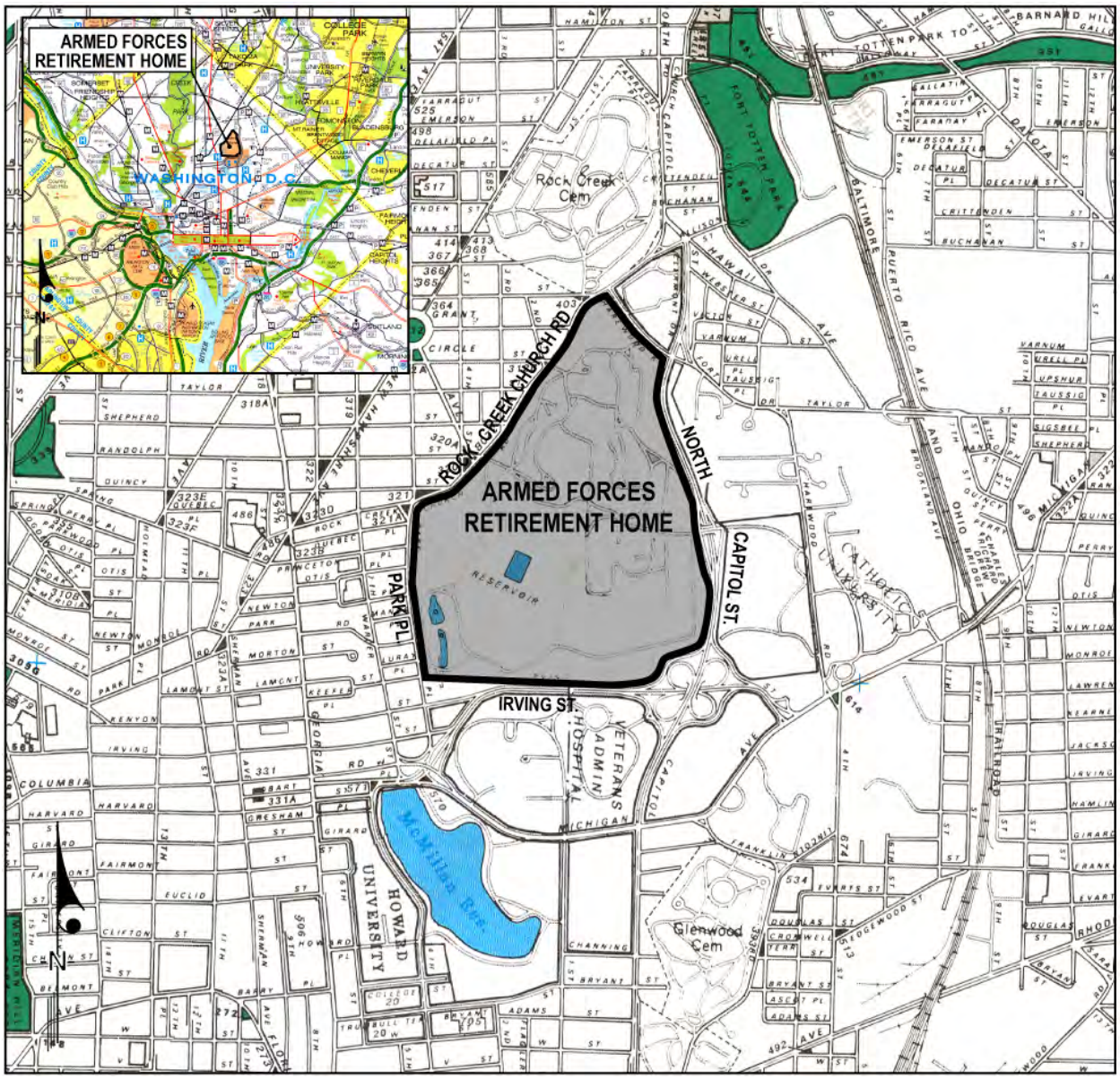

Figure 1-1: Regional Location Map

1.4 Project Objectives

The objectives of AFRH-W Master Plan are to:

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

1.5 Site Background

In 1851, the U.S. Soldiers' and Airmen's Home (formerly the Old Soldiers' Home) was established by Congress as an "asylum for old and disabled veterans" with ransom received from Mexico City after the Mexican War. Four of the original buildings still stand. Two of the buildings, Quarters 1 and Anderson Cottage, served as the summer White House for U.S. Presidents—Chester Arthur, Rutherford B. Hayes, James Buchanan and, most notably, Abraham Lincoln.

In 1991, Congress incorporated the U.S. Soldiers' and Airmen's Home and the U.S. Naval Home in Gulfport, Mississippi, into an independent establishment in the Executive Branch of the federal government, known as AFRH. In 2001, Congress renamed the U.S. Soldiers' and Airmen's Home and the U.S. Naval Home to the Armed Forces Retirement Home - Washington and Armed Forces Retirement Home - Gulfport, respectively. AFRH-W is currently home to nearly 1,200 military veterans.

1.6 Project Area – AFRH-W

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

The property includes dormitories, long-term care and assisted living facilities, chapels, a golf course, and various other administrative and support facilities. Over 100 buildings are listed on AFRH-W's building inventory. Some of the facilities once used for maintenance are now vacant because many of those functions have been outsourced.

Additional information on the existing conditions within the project area is located in Chapter 3, Affected Environment.

1.7 AFRH'S Planning Process

1.7.1 Developer Selection Process

Following publication of the Draft EIS in May 2005, AFRH with the assistance of the General Services Administration began the process of identifying a developer for AFRH-W. AFRH undertook a two-step process to select a developer for Zones 3 and 4 (now known as Zone A).

1. **Request for Qualifications.** On October 12, 2005, AFRH issued a Request for Qualifications (RFQ) to solicit qualifications and general concepts for mixed use redevelopment of approximately 77 acres in Zone A (formerly Zones 3 and 4) as identified in Alternative 3 of the Draft EIS. AFRH reviewed the responses and short listed those respondents whose concepts best met AFRH's objectives and who demonstrated exceptional experience in developing projects similar to the development program proposed.

2. **Request for Proposals.** In August 2006, AFRH issued a Request for Proposals short-listed developers. Proposals were requested from three developers who responded to AFRH's RFQ and were deemed by AFRH to be most highly qualified from the field of RFQ respondents.

On March 26, 2007, AFRH selected Crescent Resources LLC as its preferred developer to construct a mixed-use redevelopment project of approximately 4.3 million square feet of new space on the southeast corner of its Washington campus. The development which would be undertaken by Crescent Resources LLC corresponds to Zone A in Alternative 3A in this EIS. As detailed in Chapter 2, Alternatives, the proposal includes affordable housing, market-rate rental and condominium units, medical office space, a small hotel, a grocery store and other ancillary retail, transitional housing for military veterans, and approximately 20 acres of open green space which will include a public garden and picnic grove, a civic green and memorial, and pedestrian and bicycle paths.

This Final EIS has been revised to include assessment of potential impacts of the three concepts put forth by the short-listed developers as well as changes to the other development zones. These development concepts are captured in revisions to Alternative 3.

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

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

1.8.1 Statutes

- National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §4321-4347)
- National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. § 470, *et seq*.) (89 P.L. 665 (1966)); (referred to herein as "Section 106")
- Clean Air Act (CAA) of 1970 as amended (42 U.S.C. § 7401, *et seq*.)
- Clean Water Act (CWA) of 1977 as amended (33 U.S.C. § 1251, *et seq*.)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (42 U.S.C. § 9601, *et seq*.)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. §470aa-mm),
- Endangered Species Act of 1973 (16 U.S.C. §1531-1544)
- The National Defense Authorization Act for Fiscal Year 2002 (107 P.L. 107, 24 U.S.C. §401, *et seq*.)
- Resource Conservation and Recovery Act (42 U.S.C. § 6901, *et seq.*)
- Section 5 of the National Capital Planning Act of 1952 (82 P.L. 592; 66 Stat. 781, *et seq*.); (codified as amended at 40 U.S.C. §8722(b)(1))

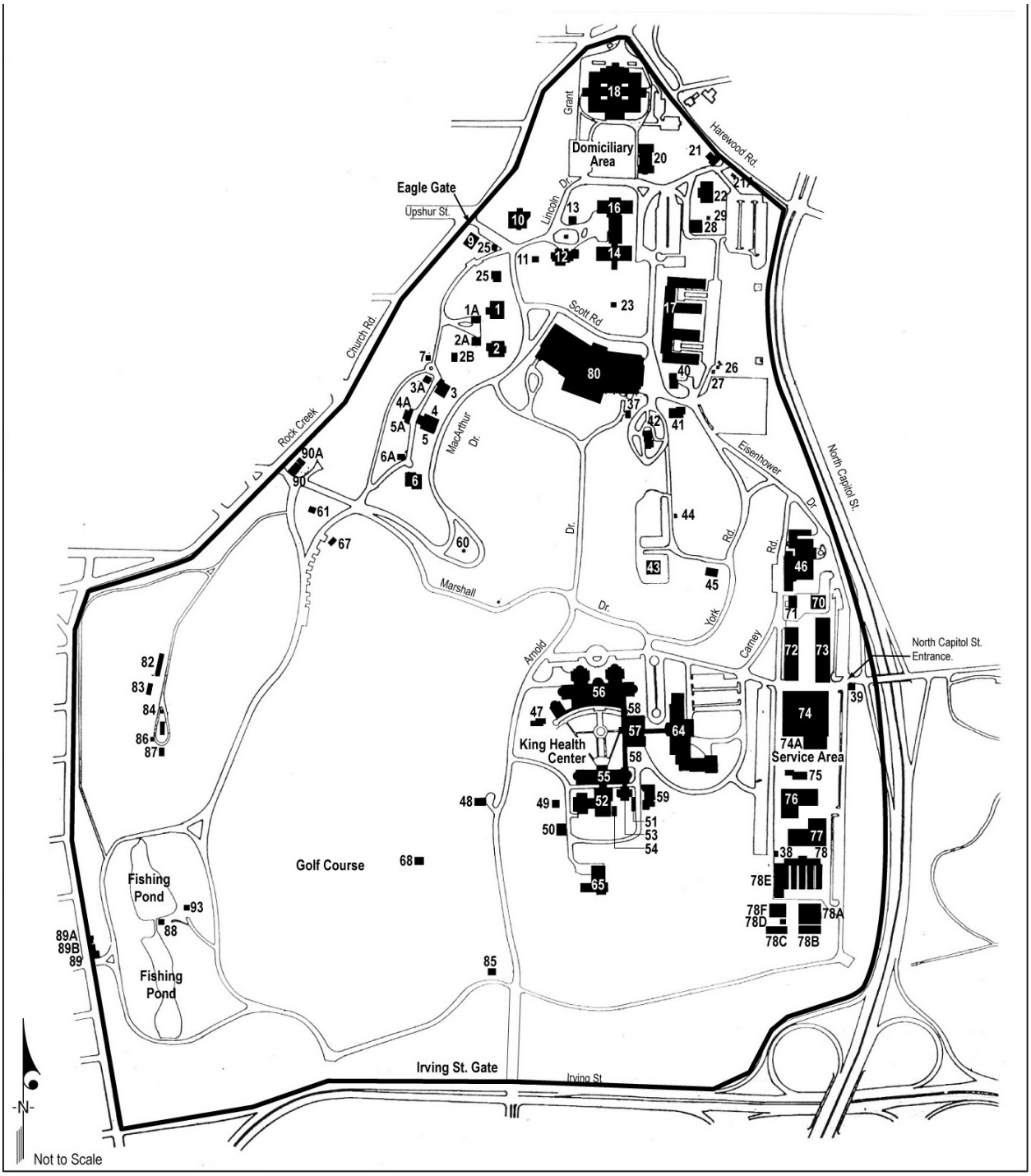

Figure 1-2: Project Area Map

1.8.2 Regulations

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

1.8.3 Plans

- Comprehensive Plan for the National Capital: Federal Elements, National Capital Planning Commission (2004)
- Comprehensive Plan for the National Capital: District Elements, District of Columbia (1999)

1.8.4 Executive Orders

- E.O. 11593 – Protection and Enhancement of the Cultural Environment
- E.O. 11988 – Floodplain Management
- E.O. 11990 – Protection of Wetlands
- E.O. 12898 – Environmental Justice
- E.O. 13287 – Preserve America
- E.O. 13327 – Federal Real Property Management
- E.O. 13423 - Strengthening Federal Environmental, Energy, and Transportation Management

1.9 Public Involvement

AFRH has prepared this EIS to ensure that 1) changes to the area in and around AFRH-W resulting from the proposed action are assessed for their impact on the human environment, and 2) to provide a vehicle for community outreach and further public involvement.

1.9.1 Scoping

In accordance with NEPA, a scoping process was conducted. The CEQ Regulations define scoping as an early and open process for determining the scope of the issues to be addressed and for identifying the significant issues related to the proposed action (40 CFR 1501.7). Scoping is usually the first direct contact between proponents of a proposed action and the public. Scoping has the following objectives:

- to identify the affected public or agency concerns;
- to facilitate an efficient environmental document preparation process through assembling cooperating agencies, assigning data collection and analysis tasks, and scheduling appropriate reviews;
- to define the issues and alternatives that will be examined in detail in the environmental document while simultaneously devoting less attention and time to issues which cause no concern; and
- to save time in the overall process by helping to ensure that the environmental document adequately addresses relevant issues.

As part of the scoping process, AFRH sent letters to various Federal and local officials, community groups, special interest groups, area residents, and AFRH-W residents. These individuals were asked to express any concerns, issues, or alternatives they would like to see addressed as part of this analysis.

In addition, AFRH held Scoping Meetings on Thursday, September 9, 2004, from 3:30 to 5:30 p.m. for residents of AFRH-W and from 6:30 to 8:30 p.m. for residents and the public. Approximately 53 people attended the meetings. Poster boards were displayed showing the project location; draft Master Plan concept; a history of AFRH; the EIS process; the Section 106 process; and environmental features to be addressed in the EIS. Project team members were available to explain the proposed project and to answer questions. An informational brochure on the project was provided to the meeting attendees. A PowerPoint presentation was also shown, providing details on the Master Plan and the NEPA and Section 106 processes. Comment forms were available for attendees to complete. Tape recorders were also available for those who

wished to record audio comments rather than submit written comments. A summary of comments received at the scoping meeting are included in Appendix A.

1.9.2 EIS Public Comment Period

The Draft EIS on AFRH Master Plan was issued on May 20, 2005. The public comment period extended from the date of issuance through July 5, 2005. A Public Hearing to present the findings of the EIS and solicit comments on the document was held on June 22, 2005 at AFRH-W. AFRH presented the Master Plan Alternatives and provided members of the public, residents of AFRH, and representatives from special interest groups and government agencies the opportunity to provide comments on the EIS. Thirty-three (33) citizens spoke at the Public Hearing. The proceedings of the meeting, including oral comments, were recorded by a stenographer. The transcript of the public hearing is located in Appendix C of this Final EIS.

In addition, written comments were received from 67 federal and local agencies, community organizations, and individual citizens. Responses to substantive comments are addressed in Chapter 9.

1.9.3 Additional Community Involvement

Following issuance of the Draft EIS, AFRH held a series of meetings with a planning committee and with community members in anticipation of the RFQ for the mixed use redevelopment in Zone A (formerly Zones 3 and 4).

1.9.3.1 Planning Committee

The Planning Committee for Zone A was comprised of representatives from community associations and Advisory Neighborhood Commissions, the National Capital Planning Commission, the DC Office of Planning, the Urban Land Institute, neighbors including the Washington Hospital Center and Catholic University, and AFRH residents. AFRH held its first meeting with AFRH planning committee on October 5, 2005 from 4:30 p.m. to 7:00 p.m. at AFRH-W. A PowerPoint presentation was given to planning committee community representatives, which consisted of residents, institution representatives and members of the community. The meeting was tape recorded and the recordings were used to make a transcript of the proceedings. Participants were provided with a background on AFRH as well as an explanation of the importance of the Trust Fund to the residents and the need for development. The purpose of the meeting was to inform the community about the Master Plan and to get

feedback on the outcome of the Master Plan and to provide community members the opportunity to comment on proposed development and to ask questions about the Master Plan process.

On October 19, 2005, Planning Committee Meeting No. 2 was held at AFRH-W. Planning committee participants had an in depth discussion regarding meeting the guidelines of the Master Plan. The primary focus was on issues such as such as the use of open spaces, building heights, and parking structures in Zone A (formerly Zones 3 and 4).

Key issues of concern discussed during the meeting included:

- Site access and security issues
- Possible tradeoffs between open spaces and building heights
- Maintaining vistas of the Washington Monument and US Capitol from the site
- Preserving the character of the site by requiring that developers disturb the site as little as possible
- Through traffic possibly adversely affecting community feel.

Planning Committee Meeting No. 3 was held at AFRH on November 3, 2005 from 4:30 to 6:30 p.m. The committee discussed some of the different options and concerns for the proposed development in each zone. Planning Committee Meeting No. 4, held December 7, 2005, walked through the draft Master Plan and further discussed the development options being considered.

Concerns addressed in the meetings included:

- Preservation of historical sites
- Retaining open spaces
- Security issues
- Public access areas

1.9.3.2 Community Master Plan Meetings

The first community meeting was held October 22, 2005, at 3:05 p.m. at St. Paul's Rock Creek Parish on Rock Creek Church Road. Approximately 39 people attended the meeting. Members of the Planning committee explained the history and historic significance of AFRH site and elucidated the need for site redevelopment. Several members of the community expressed concerns regarding the transparency of the process including selection of planning committee representatives and difficulties in navigating AFRH website. The community also voiced

concerns about how traffic will be affected, whether there will be adequate open space and accessibility once the site is redeveloped, and when and how the redevelopment process will proceed.

On October 24, 2005, a second community meeting was held at St. Gabriel's Church on Webster Street. About 51 members of the community attended the meeting. Many expressed concern about potential site uses, site access and whether new residential areas would include affordable housing. Others were concerned about the criteria used for choosing the planning committee members. Some were not feeling that the process was an open one. There were concerns about how many comments would actually be considered since AFRH already had an idea of the amount of development needed to meet its goal. Still others wanted to leave as much land as possible untouched to preserve the historic portions of the site.

The third community meeting was held at 7 p.m., November 3, 2005, at the Sweet Mango Café on New Hampshire Avenue. In attendance were approximately 61 members of the community. They expressed concerns that some necessary individuals had not been included in the planning committee and that transparency remained sub par. AFRH discussed the Master Plan process to dispel as many misconceptions as possible about the process. Still concerned with aspects of the process, community members thought things were moving too quickly and they wouldn't have adequate time to comment. Several people voiced concerns about the availability of affordable housing, how existing housing costs would be affected, and how the proposed development would affect property value. Others wanted parkland set aside and wanted public access to the lakes. There were also concerns about traffic and how potential congestion could be mitigated.

AFRH gave presentations to United Neighborhood Coalition (UNIC) on April 4, 2007; to ANC 4 on April 10, 2007; to the Federation of Citizens Associations of DC on April 24, 2007; and to ANCIA Planning and Zoning Committee on May 21, 2007. The presentations covered the background of AFRH, project history, the proposed development for Zone A, project status and updates, project time line, and any questions on presented material.

Issues identified at the community meetings were used as input in preparing the final Master Plan and led to such outcomes as a preferred alternative at the lowest scale of development, guidelines to protect views, provide openings in the historic fence for pedestrians form the adjacent neighborhood and the inclusion of open spaces accessible to the public and buffers on the perimeter. With regard to the planning process, AFRH established a number of ways of providing community input including through meetings open to the general public that were

widely advertised, participation at meetings regularly held by organizations and ANCs, an open house and site tours, and the Section 106 process.

1.9.4 Coordination with Agencies, Organizations, and Affected Persons

Coordination with Federal and local agencies, community groups, and other interested parties has been conducted throughout the preparation of this Final EIS.

As part of the EIS scoping period, AFRH coordinated with the National Capital Planning Commission, National Park Service, the Advisory Council on Historic Preservation, the Department of Defense, the Environmental Protection Agency, FEMA, and the Federal Highway Administration. Local agencies with which coordination has occurred include the DC Mayor and Council, DC Historic Preservation Office, the, DC Office of Planning, District Department of Transportation, and the DC Department of Consumer and Regulatory Affairs, and the DC Department of Public Works. Other organizations with whom AFRH has coordinated include the National Trust for Historic Preservation, Medstar/Washington Hospital Center, Catholic University, Advisory Neighborhood Commissions, various neighborhood civic associations, the DC Preservation League, National Capital Revitalization Corporation, several veteran organizations, and the United Armed Forces Association. Coordination has also taken place with the Washington Metropolitan Transportation Authority and the Metropolitan Washington Council of Governments.

1.9.5 Section 106 of the NHPA Review

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Office, and other consulting parties a reasonable opportunity to comment.

AFRH initiated consultation through the Section 106 process with the DC State Historic Preservation Office (DC SHPO), the National Park Service (NPS), and the ACHP. Consulting parties include the National Capitol Planning commission, US Commission of Fine Arts, DC Office of Planning, National Trust for Historic Preservation, DC Preservation League, Committee of 100 on the Federal City, Rock Creek Cemetery Association, St. Paul's Episcopal Church, The Advisory Neighborhood Commissions 1A, 4C, 4D, 5C, Petworth and Columbia Heights Residents Concerned, United Neighborhood Coalition, US Army, The Catholic University of America, Council Members from Ward 1,4, and 5, and the Military Officer Association of America. As a result of this consultation, a programmatic agreement is being

developed that identifies mitigation measures to be implemented as well as preservation design guidelines for the defined character areas of AFRH-W (see Section 3.3.3, Historic Properties).

Consistent with 36 CFR 800.8(c)(iv), AFRH is coordinating the public review process for Section 106 of the National Historic Preservation Act (NHPA) with the NEPA public review process. Comments on the Section 106 process can be submitted throughout the consultation process with the SHPO, the ACHP, and the NPS, as well as during the public comment periods under NEPA.

1.10 Issues Raised by This Proposed Action

1.10.1 Impact Areas

The environmental issues identified through the initial scoping efforts for this EIS and through the interdisciplinary team process are listed below. The indicators listed under each of the impact areas (such as traffic level of service) are the measures used in the impact analysis in Chapter 4 of this EIS. These indicators are assessed to determine if there would be an impact from each alternative and, if so, what the severity of the impact would be (e.g., would the level of service decline to unacceptable traffic conditions).

- **Impacts on Land Use and Plans**

  The development of the site might not be in compliance with Federal and local land use and plans.

  Indicator: Applicable plans.

- **Impacts on Security and Safety of Residents**

  Development of the site would open a previously closed Federal site and potentially pose a security risk for residents.

  Indicator: Increase in the number of people accessing the site not affiliated with AFRH-W.

- **Impacts on Population and Housing**

  Development of the site may affect the property value of homes in the immediate area.

  Indicator: Change in property values and associated property taxes.

  Minority and low-income populations potentially could be disproportionately affected by the proposed action, both adversely and positively.

Indicator: Short-term and long-term changes to traffic, noise levels, and air quality.

- **Impacts on Community Services**

  The development of the site would increase demand for local emergency services (fire, police, and ambulance), medical services, schools, and postal services.

  Indicator: Capability of community services to absorb the increased use.

- **Impacts on Natural Resources**

  New development would potentially degrade water quality in the ponds onsite.

  Indicator: Change in water-borne sediment and pollutants over time.

  New development (filling and grading) could take place in or near potential waters of the U.S.

  Indicator: Loss of wetlands.

  New development would potentially eliminate the existing greenspace and wildlife habitat.

  Indicator: Loss of forested areas, open space, and wildlife.

- **Impacts on Archeological Resources**

  Subsurface development of the site would potentially disturb archeological resources.

  Indicator: Loss/disturbance of archeological resources.

- **Impacts on Historic Resources**

  Development could potentially result in the demolition of historic resources on the ARFH-W.

  Indicator: Loss of historic resources.

- **Impacts on Visual and Aesthetic Resources**

  The development of the site could potentially change the viewshed for AFRH-W residents and neighbors.

  Indicator: Degradation of viewsheds.

- **Impacts on Transportation Systems**

  Traffic along North Capital Street, Rock Creek Church Road, and Park Place is currently somewhat congested. Additional development would increase the number and types of users at the site and increase the volume of cars on local roadways.

  Indicator: Traffic Level of Service (LOS).

Metrorail accessibility is limited. Ways to enhance the use of the system should be explored.

Indicator: Ridership increases.

Proper pedestrian circulation is important on AFRH-W campus and within the residential areas to the south and west.

Indicator: Pedestrian access restricted.

- **Impacts from Noise Levels**

  Noise levels in the surrounding community to the west could increase from additional traffic.

  Indicator: Increased decibel level.

- **Impacts on Air Quality**

  The increased number of vehicles would potentially degrade the air quality in the surrounding area.

  Indicator: Increases in the amount of emissions over time.

- **Impacts on Infrastructure**

  There may not be sufficient infrastructure to support the additional facilities.

  Indicators: Capacity of water, sewer, solid waste, electrical, natural gas, and communications systems compared to increased demand on the systems.

- **Impacts from On-Site Environmental Contamination**

  The development onsite might lead to identification of additional environmental contamination on site.

  Indicator: Previously unknown sources of contamination identified.

1.10.2 Issues Eliminated from Detailed Analysis

The following is a list of issues that were considered but, after further analysis, were eliminated from detailed study because the proposed action would cause negligible or no impact, or the issues were outside the scope of this EIS. Chapter 3 provides further explanation about each issue and why it was dismissed from detailed study.

- Floodplains

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

- Coastal Zone Management

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

- Threatened, Endangered and Sensitive Species

  According to the USFWS, there are no known federally proposed or listed endangered or threatened species within the project area (USFWS, 2004). Similarly, NPS records show that no known rare, threatened, or endangered plant or animal species are located within 1 mile of AFRH-W (see Appendix A, Agency Correspondence).

- Development Design

  The design of the proposed development at AFRH-W is subject to the Master Plan and AFRH/Developer transaction documents.

- Site Landscaping

  The landscaping to be developed on AFRH-W would depend on decisions by the developer(s) and is beyond the scope of this EIS.

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

Publication of the NOI	August 18, 2004	(Completed)
30-day Public Scoping Comment Period	August 18 - September 17, 2004	(Completed)
Public Scoping Meeting	September 9, 2004	(Completed)
Publication of Notice of Availability for Draft EIS	May 20, 2005	(Completed)
Public Comment Period on Draft EIS	May 20 – July 5, 2005	(Completed)
Public Hearing on Draft EIS	June 22, 2005	(Completed)
Publication of Notice of Availability for Final EIS	November 9, 2007	(Completed)
Public Review Period on Final EIS	November 2 – December 10, 2007	
Publication of ROD	December 2007	

1.12 Decision That Must Be Made

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

1.13 Organization of the EIS

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

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

- Chapter 7 contains the distribution list for this EIS.
- Chapter 8 contains an Index.
- A series of appendices provides more information on certain topics.

2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

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

A table is included with each Master Plan alternative to provide a summary of types of development, building heights in each zone, gross building square footage, and proposed number of parking spaces.

2.1 Alternatives Studied in Detail

While preparing the EIS, AFRH considered a variety of alternative approaches to developing AFRH-W. These alternatives resulted from interplay among AFRH's goals and objectives for the development, regulatory requirements, and consideration of market forces in AFRH's development planning process.

The alternative development process resulted in five Master Plan Alternatives and the No Action Alternative, as shown in Table 2–1. The five Master Plan Alternatives were based on varying density development build-outs.

Four development zones have been established on AFRH-W. Figure 2–1 depicts these zones. For each Master Plan Alternative, the zones remain the same, but the development use and density vary. Under each of the alternatives, development would occur first in Zone A. Development would occur in Zones B and C at a later date. Development in the AFRH Zone would take place as AFRH needs new facilities.

Table 2–1: EIS Alternatives: Proposed Development Build-Outs by Alternative

Development Space	Alternatives (GSF)					
	No Action	**Alternative 2**	**Alternative 3A**	**Alternative 3B**	**Alternative 3C**	**Alternative 4**
Institutional	0	2,550,000	350,000	350,000	350,000	350,000
Residential	0	992,000	4,018,234	4,781,819	4,189,331	4,967,000
Hotel/Conference Center	0	200,000	123,026	220,000	200,000	0
Office/Research & Development	0	3,200,000	1,383,573	692,000	1,688,600	700,000
Retail	0	130,000	243,562	241,735	470,763	300,000
Medical	0	1,600,000	240,974	250,000	0	0
Parking (spaces)	538*	0	9,125	9,120	8,497	0
TOTAL	0	**8,672,000**	**6,459,369**	**6,635,554**	**6,898,694**	**6,317,000**

The five Master Plan alternatives: 2, 3A, 3B, 3C, and 4 were created to create a range of possible planned development scenarios. In these alternatives, the zones remain the same, but the development use and density vary.

2.1.1 Alternative 1 – No Action Alternative

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

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

While the No Action Alternative does not meet the purpose and need for the proposed action, nor would it fulfill the objectives of the proposed action as described in Section 1, it is studied in this

EIS to provide a baseline for assessing the magnitude of environmental effects of the action alternatives.

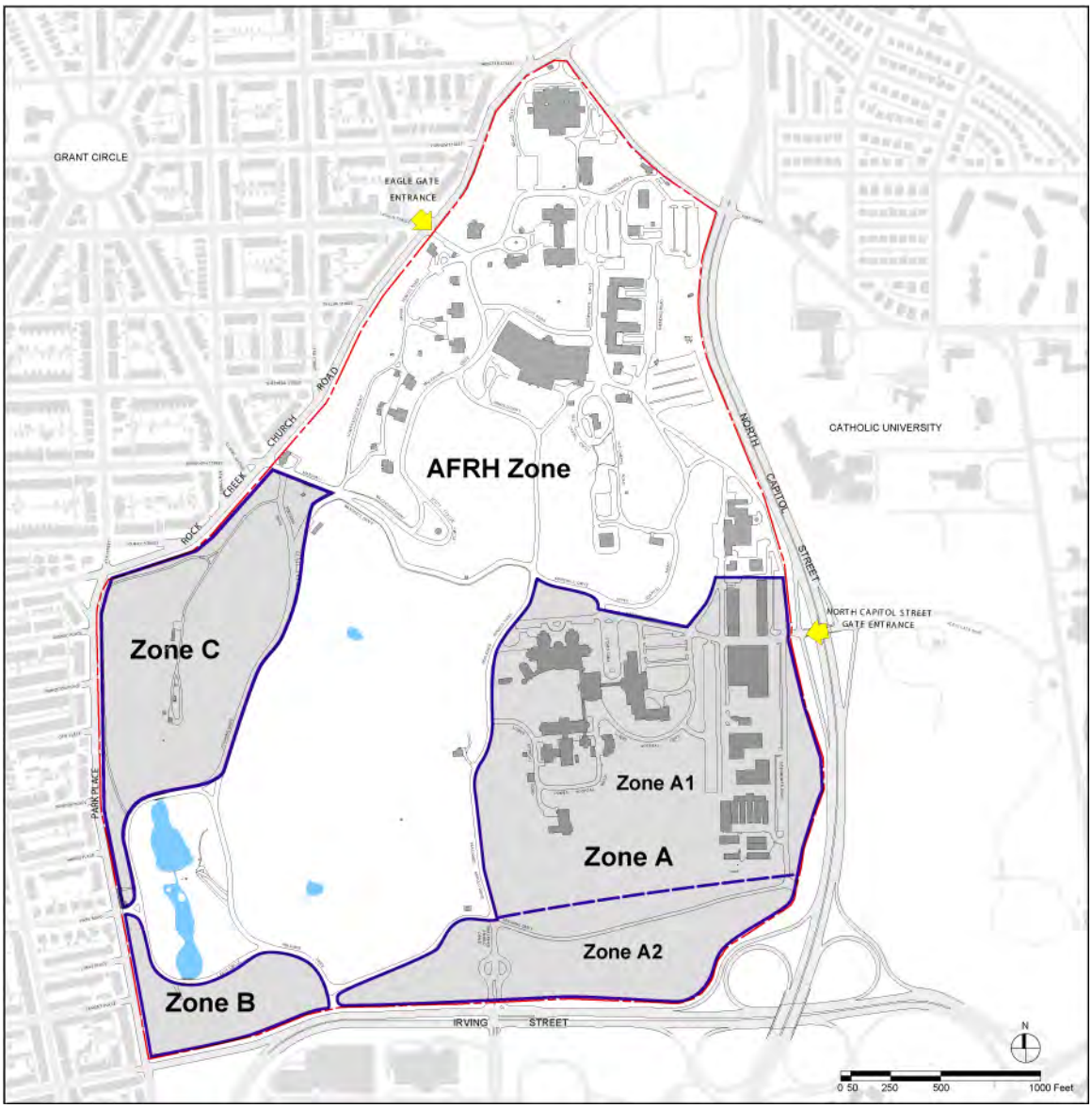

Figure 2-1: Proposed Development Zones

2.1.2 Alternative 2

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

Table 2–2: Alternative 2 Proposed Development

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

Figure 2–2 delineates the distribution of development uses under Alternative 2 on the four AFRH-W development zones. Table 2–3 provides a summary of types of development, building heights in each zone, gross building square footage, and proposed number of parking spaces.

- the AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within these Zones.
- Zone A1 is designated for educational use.
- Zones A2 and B would be developed with medical uses compatible with the Washington Hospital Center development south of Irving Street.
- Zone C would contain residential development compatible with the residential development west of Rock Creek Church Road. This zone would also potentially include retail development to serve the residential areas.

Table 2–3: Alternative 2 – Summary of Development Areas

	Height (# of Floors)	Gross Square Footage	Parking Spaces
the AFRH Zone	**4 to 6**	**392,000**	**742**
Institutional		350,000	700
Residential		42,000	42
Zone A1	**6 to 8**	**5,680,000**	**11,200**
Hotel/Conference Center		200,000	200
Research & Development		3,200,000	6,400
Institutional		2,200,000	4,400
Retail		80,000	200
Zone A2 & B	**6 to 8**	**1,600,000**	**3,200**
Medical		1,600,000	3,200
Zone C	**6 to 8**	**1,000,000**	**1,075**
Residential		950,000	950
Retail		50,000	125
New Parking Demand for Grant Building and King Hospital Complex			**538**
TOTAL		**8,672,000**	**16,755**

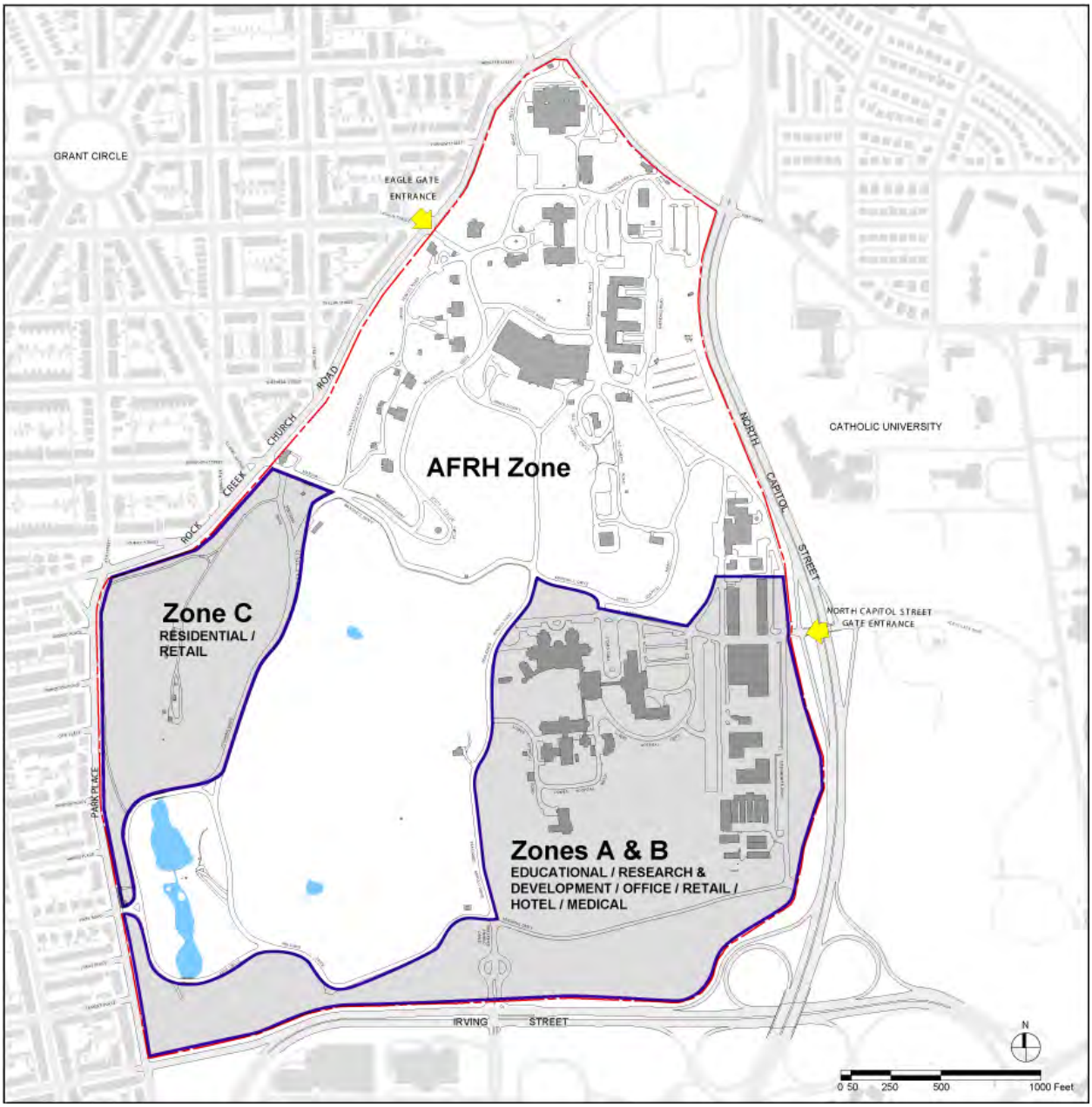

Figure 2–2. Alternative 2 Development Zones

2.1.3 Alternatives 3A, 3B and 3C

Alternatives 3A, 3B, and 3C illustrate the options for development of the individual zones on AFRH-W. In these alternatives, Zone A represents development by the developers' proposals received in response to the August 2006 Request for Proposals. A summary of the development under each of these scenarios is shown in Table 2-4.

Table 2–4: Alternative 3A, 3B, and 3C Proposed Development

	Gross Square Footage		
	Alternative 3A	**Alternative 3B**	**Alternative 3C**
Institutional	392,000	392,000	392,000
Residential	4,018,234	4,781,819	4,189,331
Hotel/Conference Center	123,026	220,000	200,000
Retail	243,562	241,735	470,763
Medical	240,974	250,000	0
Office/Research and Development	1,383,573	692,000	1,688,600
TOTAL	**6,359,369**	**6,535,554**	**6,898,694**

Tables 2-5 through 2-7 provide a summary of types of development, building heights in each zone, gross building square footage, and proposed number of parking spaces.

- the AFRH Zone is designated for institutional uses and new residential units compatible with AFRH-W operations. There would be moderate in-fill development within this Zone. In addition, several holes on the golf course would be relocated. All alterations to the golf course would occur within the footprint of the current golf course (see Figure 2-4).

- Zone A is designated for residential, office/research and development, retail, hotel, and medical uses.

- Zones B and C are designated for residential development which would take place at a later time.

Table 2–5: Alternative 3A (Preferred Alternative)
Summary of Development Areas

	Height (# of Floors)	Gross Square Footage	Parking Spaces
the AFRH Zone	**4 to 6**	**392,000**	**742**
Institutional		350,000	700
Residential		42,000	42
Zone A	**4 to 8**	**4,337,369**	**6,215**
Residential		2,346,234	
Retail		243,562	
Office/Research & Development		1,383,573	
Hotel		123,026	
Medical		240,974	
Zone B	**3 to 8**	**880,000**	**880**
Residential		880,000	880
Zone C	**4**	**750,000**	**750**
Residential		750,000	750
New Parking Demand for Grant Building and King Hospital Complex			**538**
TOTAL		**6,359,369**	**9,125**

Table 2–6: Alternative 3B – Summary of Development Areas

	Height (# of Floors)	Gross Square Footage	Parking Spaces
the AFRH Zone	**4 to 6**	**392,000**	**742**
Institutional		350,000	700
Residential		42,000	42
Zone A	**6 to 10**	**4,513,554**	**6,210**
Residential		3,109,819	3,040
Retail		241,735	1,046
Office/Research and Development		692,000	1,384
Hotel		220,000	240
Medical		250,000	500
Zone B	**6**	**880,000**	**880**
Residential		880,000	880
Zone C	**4**	**750,000**	**750**
Residential		750,000	750
New Parking Demand for Grant Building and King Hospital Complex			**538**
TOTALS		**6,535,554**	**9,120**

Table 2–7: Alternative 3C – Summary of Development Areas

	Height (# of Floors)	Gross Square Footage	Parking Spaces
the AFRH Zone	**4 to 6**	**392,000**	**742**
Institutional		350,000	700
Residential		42,000	42
Zone A	**6 to 10**	**6,779,582**	**5,587**
Residential		2,517,331	1,744
Retail		470,763	1,134
Office/Research and Development		1,688,600	2,590
Hotel		200,000	119
Medical		0	0
Zone B	**6**	**880,000**	**880**
Residential		880,000	880
Zone C	**4**	**750,000**	**750**
Residential		750,000	750
New Parking Demand for Grant Building and King Hospital Complex			**538**
TOTALS		**6,898,694**	**8,497**

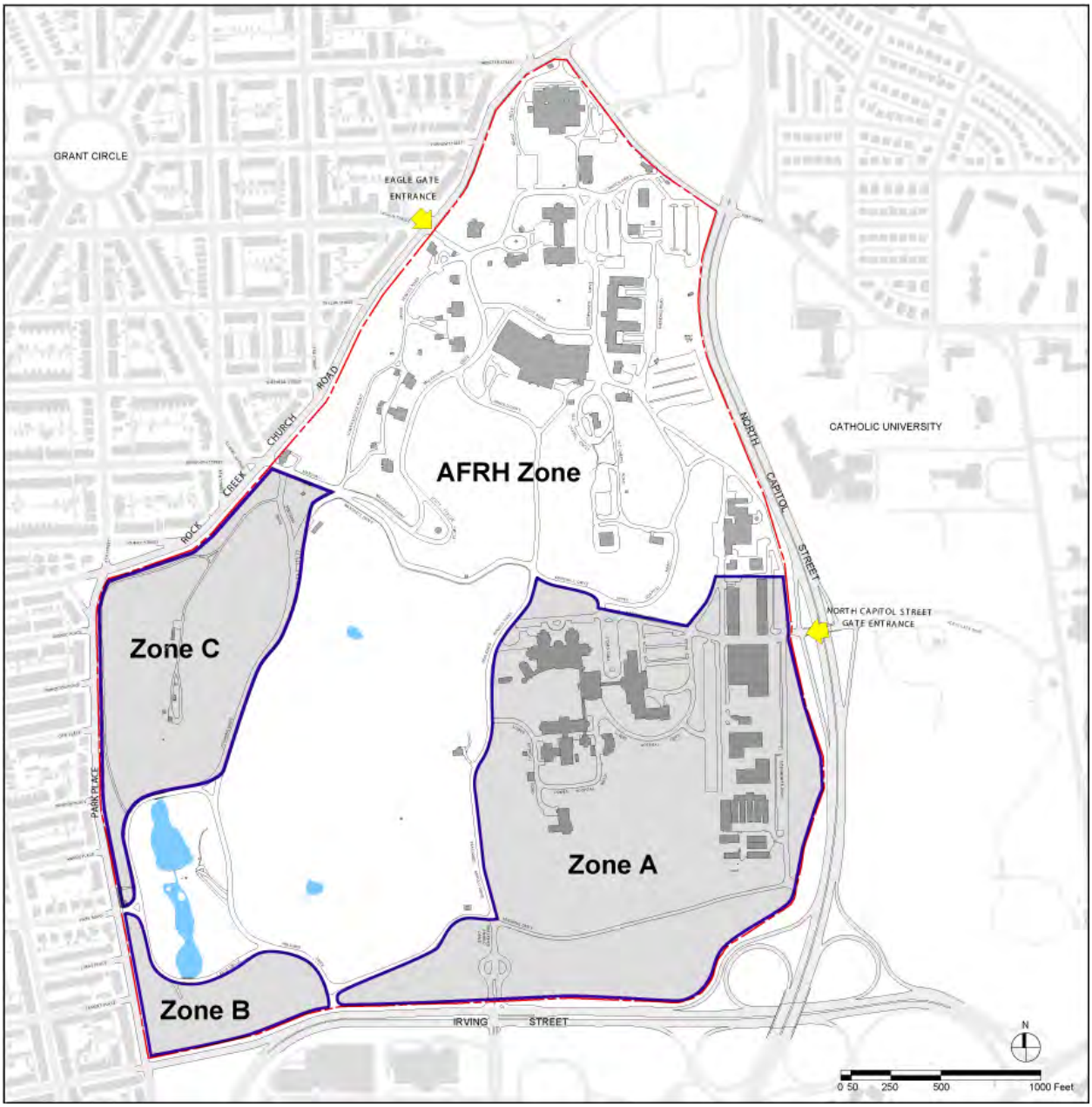

Figure 2-3. Alternative 3A, 3B, and 3C Development Zones

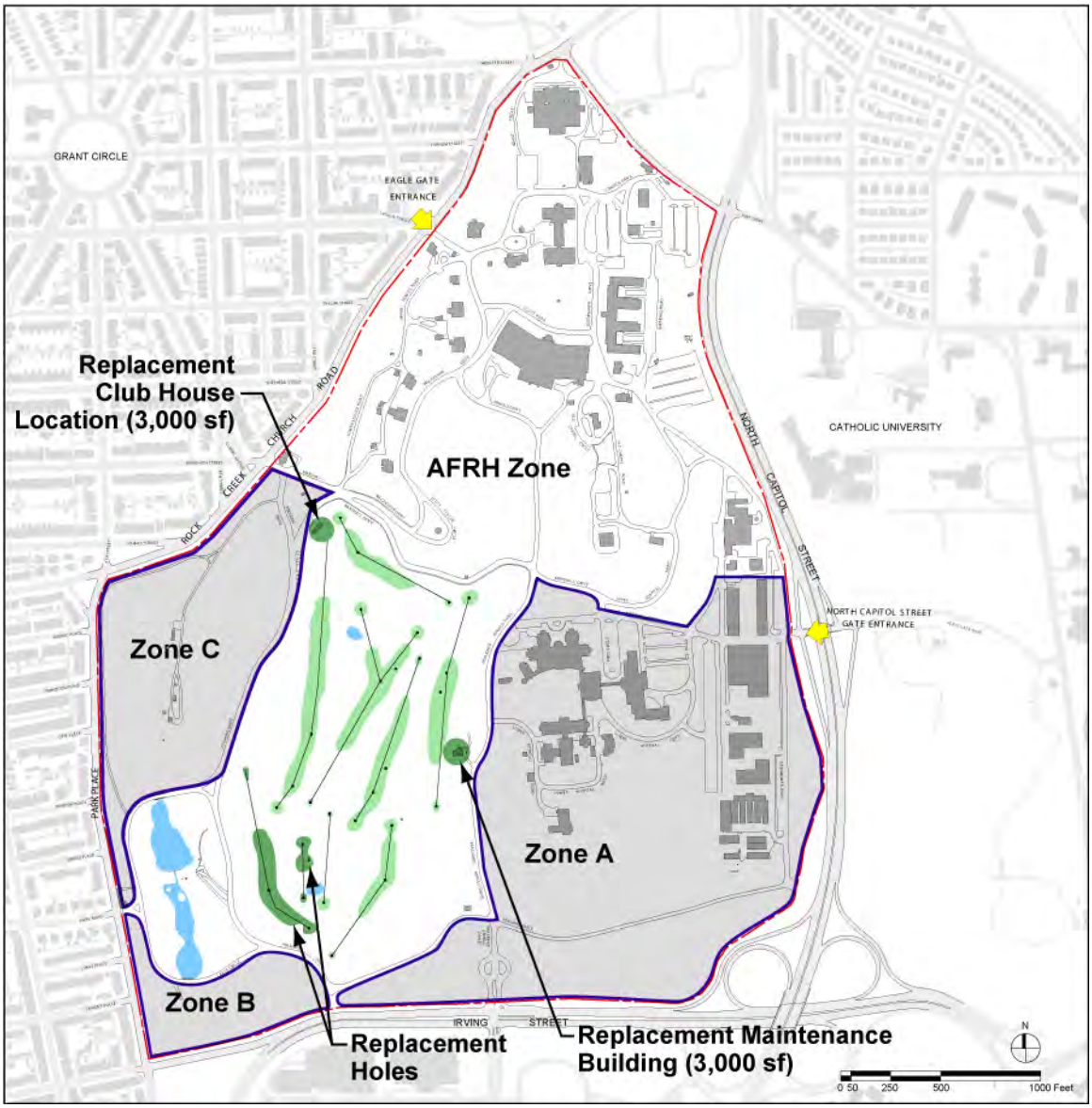

Figure 2-4. Golf Course Reconfiguration

2.1.4 Alternative 4

Under Alternative 4, AFRH-W would be developed to accommodate the development outlined in Table 2-8. This alternative was proposed to examine a program that is primarily residential, without a substantial component for medical or research and development related uses.

Table 2–8: Alternative 4 Proposed Development

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

Figure 2–5 delineates the distribution of development uses under Alternatives 4 on the four AFRH-W development zones. Table 2-9 provides a summary of types of development, building heights in each zone, gross building square footage, and proposed number of parking spaces.

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

Table 2–9: Alternative 4 – Summary of Development Areas

	Height (# of Floors)	Gross Square Footage	Parking Spaces
the AFRH Zone	**4 to 6**	**392,000**	**742**
Institutional		350,000	700
Residential		42,000	42
Zones A and B	**4 to 10**	**5,500,000**	**6,250**
Residential		4,500,000	4,100
Retail		300,000	750
Office		700,000	1,400
Zone C	**4**	**425,000**	**415**
Residential		425,000	415
New Parking Demand for Grant Building and King Hospital Complex			**538**
TOTAL		**6,317,000**	**7,945**

Figure 2–5: Alternative 4 Development Zones

2.2 Preferred Alternative

AFRH has identified Alternative 3A as the Preferred Alternative for redevelopment of AFRH-W. This alternative best meets the needs of AFRH and the objectives of the Master Plan including:

- Maximize development of AFRH-W while maintaining the historic character of the site and retaining significant existing open space;

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

The preferred alternative is nearly the least dense of the alternatives. It best addresses issues raised through community review, Section 106 consultation and National Capital Planning Commission actions on the draft 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.

2.3 Alternatives Eliminated from Detailed Study

As discussed previously, AFRH has focused on the land development option for a number of reasons. The magnitude of the immediate and projected future capital needs, the direction from Congress and Department of Defense to manage its trust fund and to be self-sufficient, the unlikelihood of obtaining appropriations, and absence of legislation that would allow AFRH to seek higher returns on its Trust Fund monies. However, several additional alternatives were assessed to determine whether they were feasible and whether they would meet the project's purpose and need and objectives. Alternatives that were considered in response to suggestions from stakeholders and were not included for further study are described below.

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

these reasons, AFRH's need is best met by considering the land development alternatives and developing a Master Plan for AFRH-W.

None of the development alternatives suggested would generate sufficient revenue for AFRH-W's needs. AFRH-W has deferred maintenance needs of over $366 million, the need for a new dementia unit costing over $5 million, and as yet unquantifiable needs to meet housing and healthcare requirements of veterans of Gulf Wars I and II who may reside at AFRH-W, and the veterans from Iraq and Afghanistan wars with brain trauma, multiple amputations, and historically high levels of post traumatic stress disorder, and their related special housing and health care needs.

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

Convert homes on General's Row into a bed and breakfast inn, a cocktail lounge, a commissary, shops, meeting rooms, a pharmacy, or outlet shops. Retail shops are being considered under several alternatives discussed above. However, there would be located outside of the secured the AFRH Zone. As well, additional land use development is necessary in order to provide sufficient revenue to support AFRH's goal of resident-focused care while replenishing the Trust Fund. Therefore, this alternative was dismissed from further consideration.

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

2.4 Summary of Impacts

The following table provides a comparison of impacts associated with each of the No Action and Master Plan Alternatives. All Master Plan Alternatives will result in similar impacts with varying degrees of intensity. Detailed information on impacts is located in Chapter 4, Environmental Consequences.

Table 2-10: Summary of Impacts

Issue	No Action Alternative	Master Plan Alternatives
Natural Resources		
Geology, Topography, and Soils	No new impacts would occur.	Direct, long-term, moderate, adverse impacts to topography and soils would occur from clearing, grading, and construction activities.
Water Resources	No new impacts would occur.	No direct impacts to water resources would occur. Increases in impervious surfaces would have indirect, long-term, moderate, adverse impacts on water quality. Channelized streams on AFRH-W may need to be relocated resulting in a direct, long-term, minor adverse impact. Installation of new stormwater management controls would result in an improvement in stormwater quantity and quality leaving the site. There would be an indirect, long-term, minor, adverse impact on the quality of stormwater runoff.
Biological Resources	No new impacts would occur.	Implementation of the Master Plan Alternatives could require removal of mature trees and construction within open space/meadows resulting in a direct, long-term, moderate, adverse impact on terrestrial biota. Increases in impervious surfaces would have indirect, long-term, minor, adverse impacts on aquatic biota.

Issue	No Action Alternative	Master Plan Alternatives
Social Environment		
Population and Housing	No impacts would occur.	The Master Plan Alternatives would add between 992,000 and 4,967,000 gsf of new residential space resulting in a direct, long-term, moderate, beneficial impact on housing stock and population.
Environmental Justice	No impacts would occur.	Low income and minority populations would not be disproportionately affected by impacts of the Master Plan Alternatives.
Community Facilities and Services	No new impacts would occur.	Additional development would require increased services from the DC Public Schools, Police, DCFD, and EMS resulting in a direct, long-term, minor adverse impact. There would also be a beneficial impact on Fire Protection due to the new and renovated up-to-code buildings as well as new fire protection devices on site. Due to the potential need to increase the number of mail carriers in the area, impacts on the U.S. Postal Service would be direct, long-term, minor, and adverse. Existing community services such as libraries, social services organizations, community organizations, and churches would likely benefit from the increase in tax base and local population caused by the development of AFRH-W.

Issue	No Action Alternative	Master Plan Alternatives
Land Use Planning and Zoning	No impacts would occur.	The proposed development would be consistent with the Federal and DC Elements of the *Comprehensive Plan for the National Capital.* The Master Plan Alternatives would result in a change in land use from open space/meadow to residential and commercial development resulting in a direct, long-term, moderate impact. The Master Plan Alternatives would act as a catalyst for future development in the area and would have an indirect, long-term, minor, beneficial impact.
Economy, Employment, and Income	A direct, long-term, major, adverse economic impact to AFRH-W would occur because sufficient funding would not be generated to support AFRH-W for future generations. As a result of insufficient funding, the number of employees would potentially be reduced, services offered to residents of AFRH-W would be reduced, and capital improvements for new services or to repair aging buildings would not be feasible. Therefore, indirect, long-term, major, adverse impacts to economy and employment would occur.	Construction would have a direct, short-term, minor, beneficial impact from the employment of construction workers and expenditures for construction materials. Long-term, moderate, beneficial impacts would occur from expenditures by new businesses and employee occupying the new development. There would be a direct, long-term, moderate, beneficial impact from the creation of new jobs on the site.

Issue	No Action Alternative	Master Plan Alternatives
Taxes and Revenue	There would be a direct, long-term, major adverse effect on AFRH revenues as the Trust Fund is used for AFRH needs.	Implementation of the Master Plan Alternatives would have a long-term, major, beneficial impact on AFRH Trust Fund revenues. There is a potential for direct, moderate, long-term, beneficial impact to the District of Columbia from tax revenues.
Cultural Resources		
Archeological Resources	No new impacts would occur.	There could be a direct, long-term, minor adverse impact on archeological resources from the implementation of the Master Plan Alternatives.
Historic Properties	Historic buildings that are currently underutilized may deteriorate over time resulting in an indirect, long-term, moderate, adverse impact to historic resources.	The Master Plan Alternatives would change the viewsheds of and therefore have indirect, long-term, moderate impacts to resources listed on and eligible for listing on the National Register of Historic Places. The Master Plan Alternatives would have direct, long-term, major, adverse impacts to the historic cultural landscape on AFRH-W. Reuse of historic buildings could have a direct, long-term, moderate, beneficial impact. There will be a direct, long-term, major, adverse impact on the historic district.

Issue	No Action Alternative	Master Plan Alternatives
Transportation		
	No new impacts would occur.	The Master Plan Alternatives would result in a direct, long-term, major, adverse impact on traffic levels in the area. Intersections at North Capitol St/Harewood Rd, and Irving St/1st St/Site Access 1 would fail under Alternative 2. Intersections at North Capitol St/Harewood Rd and Irving St/1st St/Site Access 1would fail under Alternatives 3A, 3B, 3C and 4.
Air Quality		
	No new impacts would occur.	Construction activities would result in short-term, minor, adverse impacts to air quality. Traffic increases would result in direct, long-term, minor, adverse impacts to air quality. Stationary sources would result in direct, long-term, major, adverse impacts to regional air quality.
Noise		
	No new impacts would occur.	Construction activities would result in direct, short-term, moderate, adverse impacts to noise levels. Traffic increases would result in a direct, long-term, negligible, adverse affect on noise levels.
Utilities		
	No new impacts would occur.	Direct, long-term, minor, adverse impacts on utility capacity would occur. Solid waste and medical/laboratory waste would be handled in accordance with DC regulations.

Issue	No Action Alternative	Master Plan Alternatives
Environmental Contamination		
	No new impacts would occur.	The removal of hazardous waste and contaminants in the building and on the site would have a direct, long-term, minor, beneficial impact.

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3 AFFECTED ENVIRONMENT

Chapter 3, Affected Environment, describes the environment that may be affected by the proposed action. The affected environment for this EIS includes:

1. AFRH-W – the 272-acre campus operated by AFRH
2. The study area for each affected resource. For some resources, such as vegetation, the study area is limited to AFRH-W, while for other resources the study area is broader (e.g. the study area for economic impacts is the entire Metropolitan Washington area, and the study area for transportation is intersections surrounding AFRH-W that may be affected by traffic generated by the proposed action).
3. The National Capital Region, as defined by the Metropolitan Washington Council of Governments (MWCOG). The jurisdictions of the MWCOG National Capital Region include:
    a. The District of Columbia
    b. In the state of Maryland: the counties of Frederick, Montgomery, and Prince George's, and the cities of Gaithersburg, Rockville, Takoma Park, College Park, Greenbelt, and Bowie.
    c. In the Commonwealth of Virginia: The counties of Arlington, Fairfax, Loudoun, and Prince William, and the cities of Alexandria, Falls Church, Fairfax, and Manassas.

For any one type of impact, the extent of the impact may be AFRH-W, the study area, the region, or some combination thereof. For some impacts (such as transportation), the principal affected environment is the study area; for others (such as natural resources), it is mostly AFRH-W; for still others (such as air quality), the extent of the impact is broader and encompasses the study area and the region.

Potential impacts to the affected environment are assessed in Chapter 4, Environmental Consequences.

3.1 Natural Resources

3.1.1 Geology, Topography, and Soils

ARFH-W is located in the Coastal Plain Physiographic Province, near its western boundary with the Eastern Piedmont Physiographic Province. The Coastal Plain consists of sediments mainly deposited in the Cretaceous age and has an eastward thickening wedge of unconsolidated and/or semi-unconsolidated sediments deposited on top of the crystalline rock of the Piedmont. The

U.S. Geological Survey (USGS) Geologic Map of Washington, DC and Vicinity indicates that the basal formation of the Potomac Group, known as the Patuxent Formation, is characterized by large amounts of fine to medium tan, white, yellow, or pink sands commonly mixed with variable amounts of clays, kaolin, gravels composed of large and well-rounded polished pebbles, and lenses of varicolored massive clay. The natural surficial material at AFRH-W consists of Pleistocene age deposits of the Wicomico Formation. The Wicomico formation is characterized by gravel, sand and silt with local basal deposits of carbonaceous clay containing tree stumps and other woody debris (USDI/Johnston, 1964).

The topography of AFRH-W slopes gently to the southeast. Elevations in the project area range from approximately 130 to 320 feet based on the National Geodetic Vertical Datum of 1929 (USGS, Washington West Quadrangle, 1965; photorevised 1983).

The U.S. Department of Agriculture (USDA) Soil Survey of the District of Columbia notes the presence of Udorthents (Fills) on the eastern boundary of AFRH-W; the southwest and southeast corners of the project area; and toward the center of AFRH-W, just west of the perennial stream running through the center of the project area. Immediately adjacent to the perennial stream and surrounding the pond areas in the southeastern portion of AFRH-W, Woodstown clayey sandy loams are present. Gravelly sandy loams (Sassafras and Croom Series) and silty clayey loams with gravel (Chillum Series) cover most of the project area (USDA, SCS 1975).

3.1.2 Water Resources

3.1.2.1 Groundwater Hydrology and Quality

Groundwater on AFRH-W is contained within saprolite and weathered gneiss of the eastern Piedmont sedimentary formations and, to a minor extent, within the overlying upland sand and gravel deposits. Water in the weathered gneiss follows joints and fractures in the relatively competent rock, while groundwater in the upland sand and gravel deposits travels through pore spaces in the deposits. Aquifers of the Piedmont are generally unconfined to partially confined (USGS, 2005).

3.1.2.2 Surface Water

Natural drainages on AFRH-W have historically been replaced by paved flumes of concrete, brick, or stone (Paciulli, 1998). These changes were made prior to 1965, and possibly as far back as the late 1800s or early 1900s. Other drainages on the campus have been replaced with underground storm sewers. Two fishing ponds are located in the southwest corner of AFRH-W and two small ponds are located on the golf course (see 3.1.2.3 Wetlands). A stormwater

retention pond was built in 1974 to provide stormwater management for the LaGarde Building (see Figure 3-1). All of the ponds on-site provide stormwater retention.

The USGS Topographic Map and the National Wetland Inventory Map show no streams on AFRH-W. The Soil Survey Photo Overlay Map shows intermittent streams on the campus, but all of these have been paved or sewered (USDA, SCS 1975).

During a meeting at AFRH-W with the U.S. Army Corps of Engineers (USACE) on June 12, 2007, the USACE mentioned that it may assert jurisdiction over portions (approximately 20 feet) of the concrete-lined channel that serves as the outfall for the recreational fishing ponds. In addition, the USACE may assert jurisdiction over a small portion (roughly 20 linear feet) of the concrete channel north of the fishing pond. The USACE will likely not take jurisdiction over the underground drainage ditch in the southern region of AFRH-W that crosses Pershing Drive. All of the remaining concrete drainage ditches located on AFRH-W have only a slight potential of being jurisdictional.

The final Jurisdictional Determination (JD) is pending, since the USACE requires additional information regarding the on-site drainages ditches. As a result of the *Rapanos and Carabell vs. U.S.* decision, new guidance from the USACE was provided in June 2007 that describes changes to the JD process. Under this guidance, a "significant nexus[1]" evaluation would need to be used to determine whether drainages ditches at AFRH-W are jurisdictional under the Clean Water Act.

3.1.2.3 Wetlands

Wetlands are defined by the USACE as those areas that are inundated or saturated by surface water or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3). Three parameters are used to identify wetlands: vegetation, soil, and hydrology. Wetlands are recognized for the important functions they perform. Wetlands cleanse polluted waters, retain floodwaters, and recharge groundwater aquifers. Wetlands also provide valuable fish and wildlife habitat.

[1] A significant nexus analysis assesses the flow characteristics and functions of the tributary and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a traditional navigable water (TNW). This requires additional research such as historical maps, aerials, rainfall amounts, biological factors, etc.

Laws and regulations have been implemented to protect wetlands. Development in wetland areas is regulated by the USACE pursuant to the Clean Water Act (as implemented by 33 CFR 320-329, March 28, 2000 and 33 CFR 330, March 28, 2000).

The National Wetland Inventory map shows the two ponds located in the southwest corner of AFRH-W and two small ponds located on the golf course as wetlands. In addition, wetland vegetation, specifically cattails (*Typha latifolia*), is present in the stormwater management pond described in Section 3.1.2.2. The largest drainage area on AFRH-W, which drains into the two ponds in the southwest corner of the site via a paved flume, is approximately 105 acres. The second largest drainage area flows north to south through the center of the campus via a paved flume and storm sewers. This drainage area is approximately 65 acres. Both drainage areas appear to have been ephemeral or intermittent streams at one time.

During a meeting at AFRH-W with the USACE on June 12, 2007, the USACE stated that it would likely assert jurisdiction over the two recreational fishing ponds. The USACE would likely not assert jurisdiction over the two isolated stormwater management ponds located on the golf course, but it may do so over the storm water management pond located adjacent to Pershing Drive. However, the D.C. Department of Health may assert jurisdiction over the isolated stormwater management ponds. A final JD is pending. Prior to any disturbance of these areas, a final JD from the USACE is needed to determine if these features are considered waters of the U.S. and therefore under the USACE's jurisdiction.

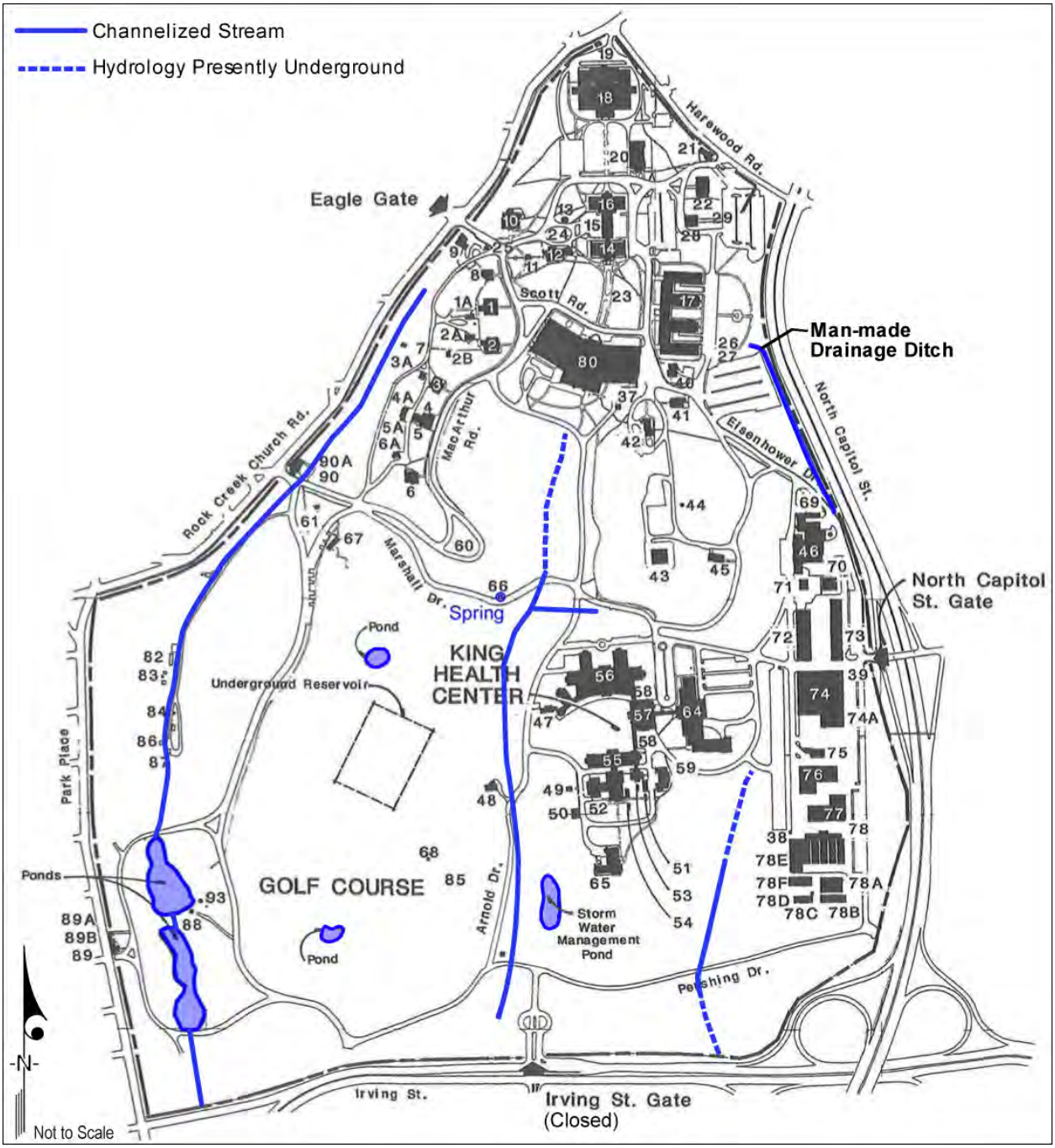

Figure 3-1: Water Resources

3.1.3 Biological Resources

3.1.3.1 Terrestrial Biota

Wildlife

Due to AFRH-W's proximity to highly developed residential and urban areas, wildlife within the project area is limited to those species that have adjusted to human activity. Common wildlife species within the project area are primarily those associated with open spaces and forest edge habitats. During site investigations in 2004 and 2005, the following species were observed: gray squirrel (*Sciurus carolinensis*), red-tailed hawk (*Buteo jamaicensis*), and northern mockingbird (*Mimus polyglottos)*. Ducks and geese (*Anatidae*) were also observed near the on-site ponds and in the vicinity of the golf course. Speicies that may also be present on site include mammals such as white-tailed deer (*Odocoileus virginianus)*, fox (*Vulpes vulpes),* and groundhogs (*Marmota monax*), as well as migratory birds.

Vegetation

Much of AFRH-W is covered with landscaped green space, specifically in the golf course area and the north portion of AFRH-W. Large expanses of native and nonnative vegetation are present within AFRH-W. Table 3-1 provides a list of native tree species that were recorded during a vegetation inventory of AFRH-W in 2004.

Table 3-1: Native Tree Species Observed at AFRH-W

Location Observed	Common Name	Scientific Name
Northern Region	willow oak	*Quercus phellos*
	white oak	*Quercus alba*
	northern red oak	*Quercus rubra*
	chestnut oak	*Quercus prinus*
	scarlet oak	*Quercus coccinea*
	red maple	*Acer rubrum*
	eastern red cedar	*Juniperus virginiana*
	American basswood	*Tilia americana*
	eastern white pine	*Pinus strobus*
	mockernut hickory	*Carya alba*
	bigleaf magnolia	*Magnolia macrophylla*
	blackgum	*Nyssa sylvatica*
	tuliptree	*Liriodendron tulipifera*

Table 3-1: Native Tree Species Observed at AFRH-W

Location Observed	Common Name	Scientific Name
	flowering dogwood	*Cornus florida*
	dawn redwood	*Metasequoia glyptostroboides*
	southern catalpa	*Catalpa bignonioides*
	sassafras	*Sassafras albidum*
	American elm	*Ulmus americana*
	black walnut	*Juglans nigra*
	sweetgum	*Liquidambar styraciflua*
	honeylocust	*Gleditsia triacanthos*
Southern Region (Along Irving Street)	American sycamore	*Platanus occidentalis*
	red maple	*Acer rubrum*
	scarlet oak	*Quercus coccinea*
	eastern white pine	*Pinus strobus*
	eastern redcedar	*Juniperus virginiana*
	American basswood	*Tilia americana*
	tuliptree	*Liriodendron tulipifera*
Southeastern Region (Along North Capitol Street)	white oak	*Quercus alba*
	eastern white pine	*Pinus strobus*
Southwestern Region (Around Pond)	bald cypress	*Taxodium distichum*
	blue spruce	*Picea pungens*
	black locust	*Robinia pseudoacacia*
South-central Region (Golf Course)	white oak	*Quercus alba*
	northern red oak	*Quercus rubra*
	southern catalpa	*Catalpa bignonioides*
	blue spruce	*Picea pungens*

Native shrubs and vines recorded during the vegetation inventory included coralberry (*Symphoricarpos orbiculatus*) and Virginia creeper (*Parthenocissus quinquefolia*).

The meadow along Irving Street at the southern portion of the project area is dominated by native wildflowers such as white heath aster (*Symphyotrichum ericoides*), jimsonweed (*Datura stramonium*), Queen Anne's lace (*Daucus carota*), green bristlegrass (*Setaria viridis*), pokeweed (*Phytolacca dodecandra*), Pennsylvania smartweed (*Polygonum pensylvanicum*), and American

vetch (*Vicia Americana*). Nonnative vegetation in this meadow includes clover (*Trifolium spp.*), chicory (*Cichorium intybus*), and common dandelion (*Taraxacum officinale*).

Two invasive species, paper mulberry (*Broussonetia papyrifera*) and tree of heaven (*Ailanthus altissima*), are present in the meadow region and the area surrounding the pond in the southwestern region of AFRH-W.

Nonnative horticultural vegetation have been also planted within the project area and include European beech (*Fagus sylvatica*), forsythia (*Forsythia spp*.), English ivy (*Hedera helix*), rose of sharon (*Hibiscus syriacus*), crapemyrtle (*Lagerstroemia indica L*.), prairie crabapple (*Malus ioensis*), and weeping willow (*Salix xsepulcralis*).

3.1.3.2 Aquatic Biota

Two stocked recreational fishing ponds are located on the southwestern corner of AFRH-W. Species found in the two fishing ponds include crappie (*Centrarchidae*), bass (*Percichthyidae*), and catfish (*Ictaluridae*).

Figure 3-2: Site Vegetation

3.2 Social Environment

3.2.1 Population and Housing

Population data from the 2000 Census were used to determine current population numbers for the area. AFRH-W is located within Census Tract 23.02. Census tracts immediately adjacent to the site include 23.01, 24, and 32 (see Figure 3-3). Table 3-2 provides a summary of the demographic characteristics of all the census tracts.

The predominant race in the census tract, including AFRH-W and the tracts adjacent to the project area, is black, with percentages higher than the District in all tracts except 23.02 where AFRH-W is located. The percentage of white individuals in the study area is highest in Census Tract 23.02 (29.9 percent), with the other census tracts ranging from 4.4 percent to 7.3 percent. The percentage of Asian individuals (1.6 percent) is also highest in Census Tract 23.02, followed by 0.5 percent in Census Tract 23.01, 0.4 percent in Census Tract 24, and 0.2 percent in Census Tract 32. Approximately 2.4 percent of individuals in Census Tract 23.02 are recorded in the Census as some other race; 4.4 percent in 23.01; 6.6 percent in Census Tract 24; and 8.4 percent in Census Tract 32. The percentage of individuals who are two or more races is very similar for all census tracts in the study area.

The Hispanic/Latino population the study area is similar to the District as a whole. Hispanic/Latinos comprise approximately 8.1 percent of the population in Census Tract 23.01, 3.9 percent of the population in Census Tract 23.02, 12.6 percent of the population in Census Tract 24, and 15.0 percent of the population in Census Tract 32. Approximately 7.9 percent of the District population is Hispanic/Latino.

The median household income for Census Tract 23.02 is higher than that of the District and the areas adjacent to AFRH-W. The median incomes in the project area are slightly lower for Census Tracts 24 and 32 than the total for the District and slightly higher for Census Tracts 23.01 and 23.02. The percentage of individuals living below the poverty level in the study area is slightly higher in Census Tracts 23.02 and 32 than in the District as a whole and is slightly lower in Census Tracts 23.01 and 24.

There are 587 housing units in Census Tract 23.02. Of these, 3.4 percent were vacant, 29.3 percent were owner-occupied, and 70.7 percent were renter-occupied. In Census Tract 23.01 there are 1,154 housing units, 9.2 percent of which are vacant. Approximately 72.5 percent were owner-occupied and 27.5 percent were renter-occupied. There are 1,369 housing units in Census Tract 24, 8.6 percent of which are vacant.

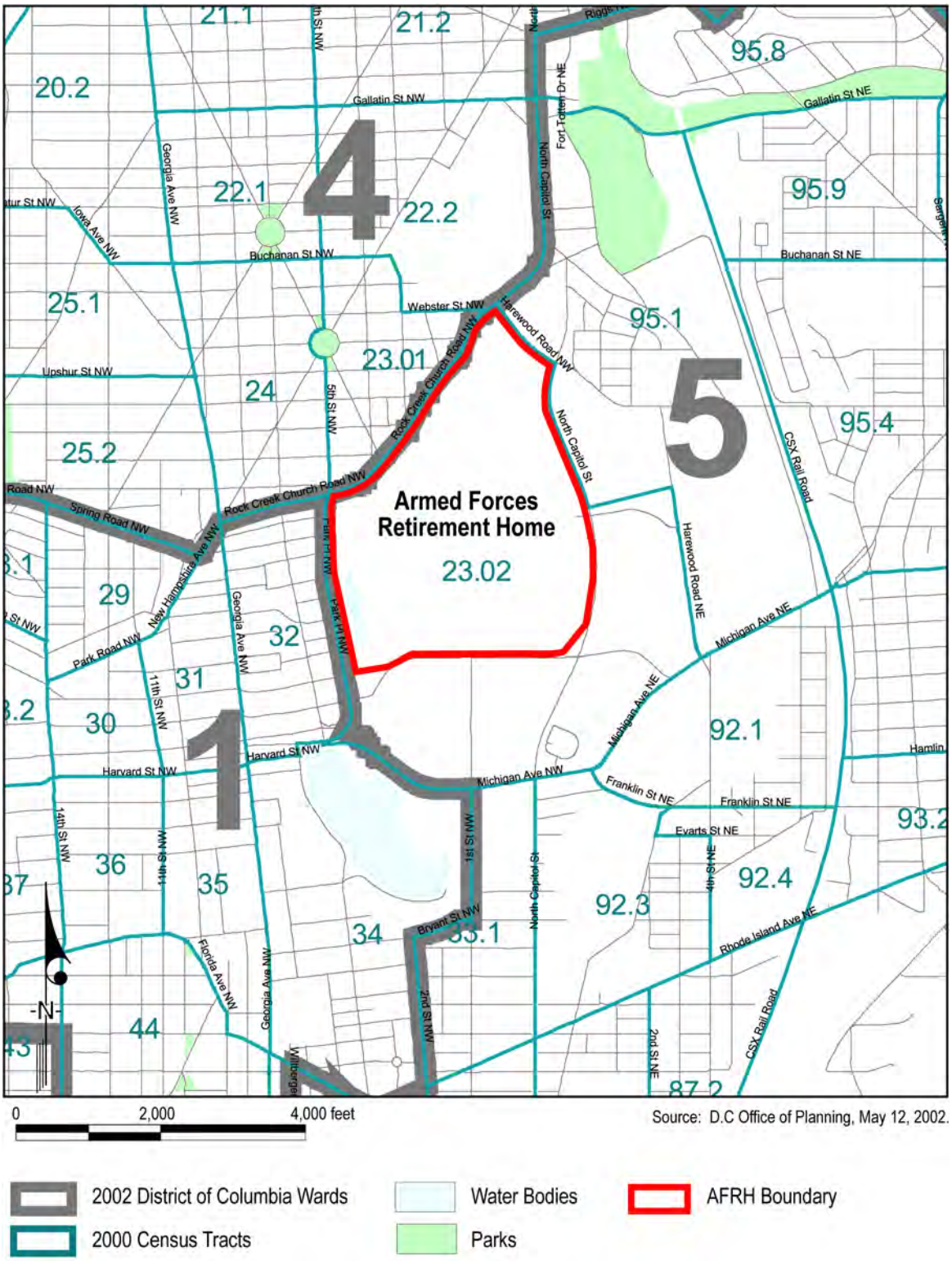

Figure 3-3: Census Tracts in AFRH-W Study Area

Table 3-2: Study Area Demographics

	Washington, DC	Census Tract 23.01	Census Tract 23.02	Census Tract 24	Census Tract 32
Population	572,059	2,993	1,347	3,580	4,480
Race					
White	30.8%	4.4%	29.9%	7.3%	5.6%
Black	60.0%	88.1%	63%	82.8%	82.1%
American Indian	0.3%	0.3%	0	0.1%	0.6%
Asian	2.7%	0.5%	1.6%	0.4%	0.2%
Hawaiian	0.1%	0.1%	0	0	0
Other Race	3.8%	4.4%	2.4%	6.6%	8.4%
Two or More Races	2.4%	2.2%	2.5%	2.7%	3.2%
Hispanic/Latino	8.0%	8.1%	3.9%	12.6%	15.0%
Median Household Income	$40,127	$44,069	$49,519	$37,304	$31,662
Poverty Status	20.2%	18.3%	23.9%	15.1%	27.7%

Approximately, 63.3 percent of the occupied housing units in this census tract are owner-occupied and 36.7 percent are renter-occupied. In Census Tract 32, there are 1,787 housing units; 13 percent of these are vacant; 55.6 percent of the occupied units are owner-occupied; and 44.4 percent are renter-occupied.

AFRH-W houses approximately 1,200 retired military personnel.

Private residential areas consisting primarily of two- and three-story row houses are located northwest and southwest of AFRH-W.

3.2.2 Environmental Justice

Executive Order (EO) 12898 directs Federal agencies to identify and address as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. The process followed by AFRH-W to identify potential disproportionate impacts associated with the proposed action and to ensure compliance with this directive was initiated early in the NEPA scoping and will continue throughout the process. The early scoping process was as follows:

- identification of the potentially affected population in the study area;
- characterization of the study area with respect to minorities and low-income populations;
- determination of potentially significant adverse impacts of the proposed action and alternatives; and
- evaluation of the potential for disproportionately high and adverse impacts on minority populations and low-income populations in proximity of the alternate sites.

There are minority groups and low-income populations in the vicinity of AFRH-W. The demographic makeup of the Census Tracts within and adjacent to the project area is shown in the Table 3-2.

The minority population within the study area is slightly higher in proportion to the total minority population in the District as a whole. The Hispanic/Latino populations in Census Tracts 24 and 32 are higher than the District as a whole. Also, the number of residents living below the poverty level in Census Tract 23.02, which includes AFRH-W, and Census Tract 32, is slightly higher than the District as a whole, and the number of residents living below the poverty level in Census Tracts 23.01 and 24 is slightly lower than the District as a whole.

3.2.3 Community Facilities and Services

Community facilities and services are shown on Figure 3-4. AFRH-W is within the District of Columbia's Fifth Police District, located at 1805 Bladensburg Road, NE, approximately 4 miles from AFRH-W. The Fifth Police District contains four Police Service Areas (PSAs); AFRH-W is located within PSA 501. The rate of reported crime in the Fifth Police District has declined steadily from 11,007 crimes in 1993 to 4,780 crimes in 2005. Reported crime in the Third Police District has declined steadily from 9,191 crimes in 1993 to 7,734 crimes in 2005. These trends are consistent with declining crime rates throughout the District of Columbia. While AFRH-W is located in the Fifth Police District, the closest police station is located in the Third Police District at 814 Shepherd Street, NW, approximately 1 mile from AFRH-W.

The DC Fire and Emergency Medical Services Department provides fire and rescue services for AFRH-W. The closest station, which houses Engine Company 14 and Medic Unit-14, is located at 4801 North Capitol Street NE, approximately 1 mile from AFRH-W. The response time to AFRH-W from Engine Company 14 / Medic Unit-14 is approximately 4 minutes. Engine Company 17 Station is approximately 2 miles from the site and is located at 1227 Monroe Street NE. The response time to AFRH-W from Engine Company 17 is approximately 3 minutes.

AFRH-W is located in a residential area, but is approximately ¼ mile east of the Georgia Avenue Corridor. Commercial facilities in this area include: grocery, liquor, hardware and clothing stores; beauty salons; restaurants; and other retail businesses. These neighborhoods contain many community facilities, which are listed below. The site is located in Advisory Neighborhood Commission 5C.

The area surrounding AFRH-W falls within Planning Areas E, F, and H of the District of Columbia Public School System (DCPS, 2003). In Planning Area E, for the school year 2005-2006, 1,752 spaces were available in public elementary schools, 1858 spaces were available in middle schools, and 472 spaces were available in high schools. In Planning Area F, 1,897 spaces were available in public elementary schools, 356 spaces were available in middle schools, and 471 spaces were available in high schools. In Planning Area H, 1,673 spaces were available in public elementary schools, 217 spaces were available in middle schools, and 441 spaces were available in high schools. For the public schools listed below, the percentages of the school aged residents enrolled in public schools ranged from 66 percent to 82 percent.

Churches

Holy Family – 4250 Harewood Road NE
Ukrainian Catholic Shrine – 4250 Harewood Road NE
Jerusalem Church of the Lord – 98 Webster Street NE
Victory Church of Jesus Christ – 4210 2nd Street NW
Emanuel Faith Tabernacle – 215 Upshur Street NW
The Basilica of the Shrine of the Immaculate Conception – 400 Michigan Avenue NE
Rock Creek Church – Webster Street & Rock Creek Church Road NW

Schools

Arc of DC – 900 Varnum Street NE
Archbishop Carroll High School – 4300 Harewood Road NE

Brookland Elementary School – 1150 Michigan Avenue NE
Cardozo Senior High School - 1300 Clifton Street, NW
Macfarland Middle School – 4400 Iowa Avenue NW
Park View Elementary School – 3560 Warder Street NW
Roosevelt Senior High School – 4301 13th Street NW
Tri-Community Public School – 3700 N. Capitol Street NW

Universities

Catholic University – 620 Michigan Avenue NE
Trinity University – 125 Michigan Avenue NE

Service Facilities

Washington Hospital Center – 110 Irving Street NW
Children's National Medical Center – 111 Michigan Avenue NW
National Rehabilitation Center – 102 Irving Street NW
Washington, DC Veterans Affairs Medical Center – 50 Irving Street NW
Petworth Library – 4200 Kansas Avenue NW
Capitol Area Food Bank – 645 Taylor Street NE
U.S. Post Office, Lammond-Riggs Station – 6200 N. Capitol Street NW

Recreational Facilities

Edgewood Recreation Center – 3rd and Evarts Street NE
Parkview Recreation Center – Warder Street and Princeton Place NW

1	Holy Family Church and Ukrainian Catholic Shrine	11	Parkview Elementary School	21	Cardozo High School
2	Jerusalem Church of the Lord	12	Roosevelt Senior High School	22	Fifth Police District
3	Victory Church of Jesus Christ	13	Tri-Community Public School	23	Police Station - ROC North
4	Emanuel Faith Tabernacle	14	Catholic University	24	Engine Company 17
5	The Basilica	15	Trinity University	25	Engine Company 14 and Medic Unit 14
6	Rock Creek Church	16	Washington Hospital Center		
7	Arc of DC - School	17	Washington DC VA Medical Center	26	Howard University
8	Archbishop Carroll High School	18	Petworth Library		
9	Brookland Elementary	19	Capitol Area Food Bank		
10	Macfarland Middle School	20	US Post Office		

Figure 3-4: Community Facilities and Services

3.2.4 Land Use Planning and Zoning

3.2.4.1 Regional Land Use Planning and Zoning

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 Federal Elements of the Comprehensive Plan are directed at existing and future federal lands and facilities in the Capital Region, and contain recommendations for growth and development of the National Capital Region. These elements contain policy guidelines for: federal facilities, federal employment, foreign missions and international organizations, parks and open space, federal environment, visitors to the District of Columbia, and preservation and historic features. The National Capital Planning Commission develops and administers the Federal Elements.

The District Elements focuses 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. It contains recommendations for economic development, housing, environmental protection, transportation, public facilities, urban design, the downtown area, human services, and land use. The District of Columbia Office of Planning develops and administers the District Elements.

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 "conduct its activities and manage its property in a manner that promotes the National Capital Region as a leader in environmental stewardship and preserves, protects, and enhances the quality of the region's natural resources, providing a setting that benefits the local community, provides a model for the country, and is worthy of the nation's capital."
- **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 and enhance the image and identity of the Nation's Capital and region through design and development respectful of the guiding principals of the L'Enfant and McMillan Plans, the enduring value of historic buildings and places, and the symbolic character of the capital's setting.
- **Foreign Mission and International Organizations:** Plan and secure a welcoming environment for the location of diplomatic and international activities in Washington, DC in a manner that is appropriate to the status and dignity of these activities, while enhancing Washington's role as one of the great capitals of the world.

District of Columbia Elements

District Elements of the Comprehensive Plan relevant to the proposed AFRH-W project include the Economic Development Element, the Urban Design Element, and the Preservation and Historic Features Element.

- **Economic Design Element:** The economic development planning policies of the District are designed "to provide the necessary framework for the expansion and enhancement of economic development activities" in the District. The economic goals are to retain and expand existing businesses, attract new industries, and create jobs for District residents, while facilitating and developing business ownership and employment advantages for those underrepresented in the District's productive economy.
- **Urban Design Element:** This element promotes the protection, enhancement and enjoyment of the natural environs and promotes a built environment that serves as a complement to the natural environment, provides visual orientation, enhances the District's aesthetic qualities, emphasizes neighborhood identities, and is functionally efficient.
- **Preservation and Historic Features Elements:** The primary goal of this element is to preserve the important features of the District while permitting new development that is compatible with those features.

3.2.4.2 Project Area Land Use, Planning, and Zoning

Land Use

According to the District of Columbia Generalized Land Use Map, land use on AFRH-W is characterized as "federal," meaning that the land and facilities onsite are occupied by the federal government (DC Office of Planning, 2002). 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 are being renovated to serve as a museum and visitor center. There is also a bank branch, charter school, greenhouses for the Smithsonian Institution and a transitional facility for veterans located on the site under short tem agreements.

Land uses adjacent to AFRH-W are residential, institutional (medical, and education facilities), and commercial retail (see Figure 3-5). 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

Other planned development that would occur within the project area of AFRH –W Master Plan includes:

<u>McMillan Reservoir</u>

McMillan Reservoir Sand Filter Site originally provided clean, safe drinking water to the District, until 1985 when the outdated facility was replaced by technological advances. The site was sold by the federal government to the District in 1987 for the purposes of community development. Since 1991, McMillan Reservoir has been listed as a National Historic Landmark.

In February 2002, the DC Office of Planning released recommendations for rehabilitation of the 25 acre McMillan Reservoir site, but the District decided not to pursue site development. Private developers and members of the community expressed an interest in developing the site if the city could provide the initial funding, but due to limited funding, the city was unable to proceed with development. The property was transferred to the National Capitol Revitalization Corporation in 2006. The NCRC is currently working with the local community on development options for the site.

Washington Hospital Center

The Washington Hospital Center (WHC) has been approved for expansion. The WHC has been approved for growth from approximately 5,600 employees today to a projected employee total of 7,700 in the year 2015. In conjunction with this expansion, changes to parking and access around the hospital are anticipated to significantly affect traffic in the immediate vicinity of the hospital center, particularly along Irving Street.

Children's National Medical Center

Children's National Medical Center (CNMC) is currently undergoing changes to enhance their ability to serve their patients. The expansion will feature a new east wing complete with private patient rooms, state-of-the art equipment and technology.

Upper Georgia Avenue Land Development Plan

This plan, which is part of the Great Streets Initiative, is a revitalization strategy for future development along the Georgia Avenue corridor from Decatur Street north to Eastern Avenue. The plan calls for ten key strategies for transforming Upper Georgia Avenue into a lively, walkable, shopping street that will serve adjacent residential neighborhoods (DCOP, 2007).

Catholic University Master Plan

Catholic University approved a 10-year Campus Master Plan that calls for changes in the current use of buildings such as McMahon Hall and for dedicating more space in residence halls for graduate students. As part of this Master Plan, the University has selected a contractor, the Opus East Corporation, for development of Opus Hall. Construction is currently underway.

Zoning

AFRH-W is zoned GOV, Government (see Figure 3-6, Zoning). As a federal property, AFRH-W is not subject to local zoning regulations. The area immediately west of AFRH-W is zoned R-4. The areas to the east and south of the site are zoned R-5-A. Areas north of the site are zoned R-5-A, R-3, and C-1. See Table 3-3 for the definitions of each zoning district. On Aug 2, 2007, GSA signed an MOU with DC Office of Planning and NCPC to establish a hybrid approach for controls over the mixed use redevelopment of a portion of AFRH-W.

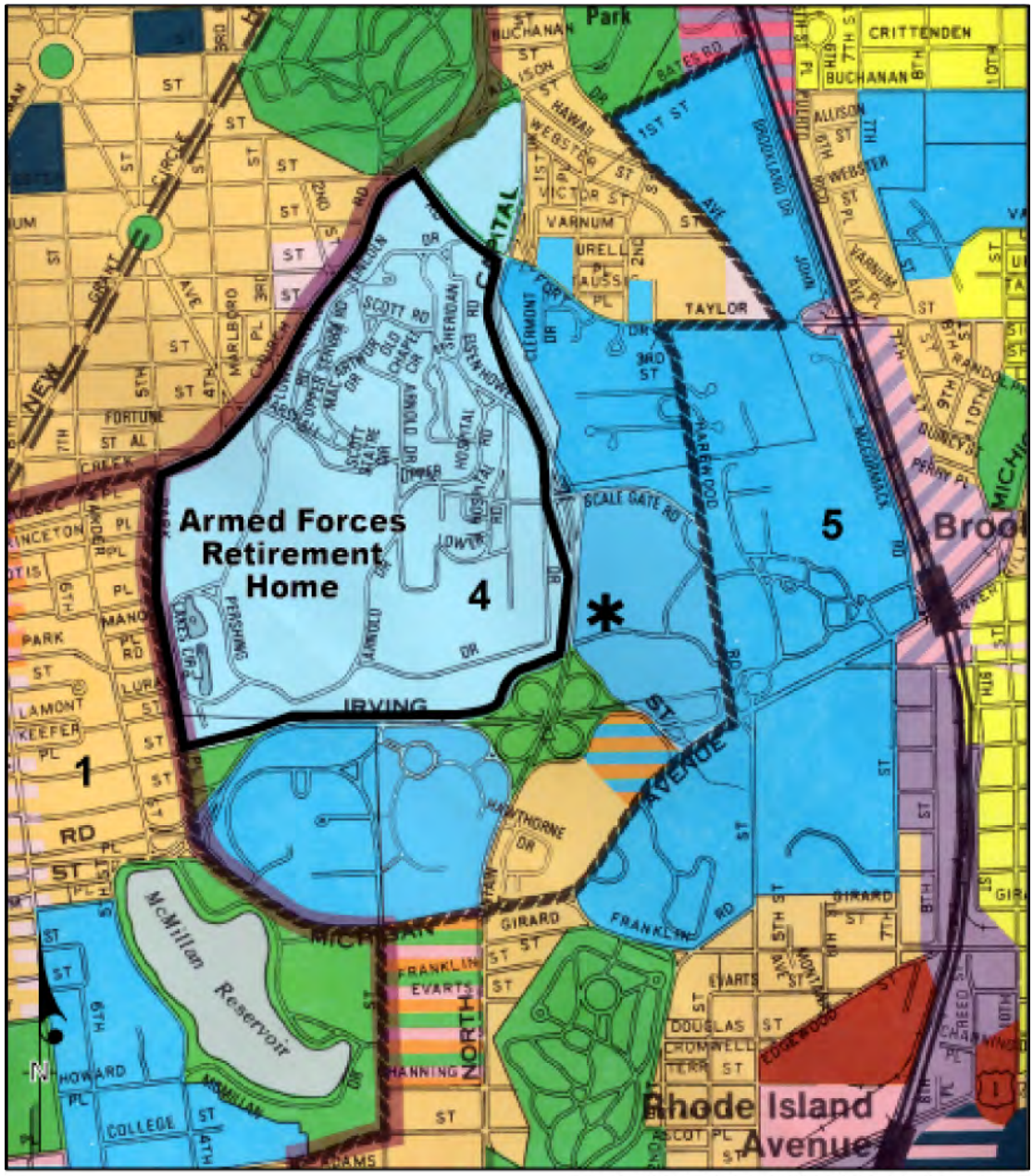

Figure 3-5: Land Use

Table 3-3: Zoning Districts and Definitions

Zoning District	Summary Definition
R-4	Permits matter-of-right development of single-family residential uses (including detached, semi-detached, row dwellings, and flats); churches and public schools with a minimum lot width of 18 feet; a minimum lot area of 1,800 square feet and a maximum lot occupancy of 60 percent for row dwellings, churches and flats; a minimum lot width of 30 feet and a minimum lot area of 3,000 square feet for semi-detached structures; a minimum lot width of 40 feet and a minimum lot area of 4,000 square feet and 40 percent lot occupancy for all other structures; and a maximum height of three stories/40 feet. Conversions of existing buildings to apartments are permitted for lots with a minimum lot area of 900 square feet per dwelling unit (DC Office of Zoning, 2004).
R-5-A	Permits matter-of-right development of single-family residential uses for detached and semi-detached dwellings, and with the approval of the Board of Zoning Adjustment, new residential development of low density residential uses including row houses, flats, and apartments to a maximum lot occupancy of 40 percent and 60 percent for churches and public schools; a maximum floor area ratio (FAR) of 0.9; and a maximum height of three stories/40 feet. Conversion of existing buildings to flat or apartment use is permitted as a matter of right provided all other provisions of the zoning regulations are complied with.
R-3	Permits matter-of-right development of single-family residential uses (including detached, semi-detached, and row dwellings); churches and public schools with a minimum lot width of 20 feet; a minimum lot area of 2,000 square feet and a maximum lot occupancy of 60 percent for row dwellings; a minimum lot width of 30 feet and a minimum lot area of 3,000 square feet and 40 percent lot occupancy for semi-detached structures; and a minimum lot width of 40 feet and a minimum lot area of 4,000 square feet and 40 percent lot occupancy for detached structures; and a maximum height of three stories/40 feet.
C-1	Permits matter-of-right neighborhood shopping and low density development to a maximum lot occupancy of 60 percent for residential use; a maximum FAR of 1.0; and a maximum height of three stories/40 feet.

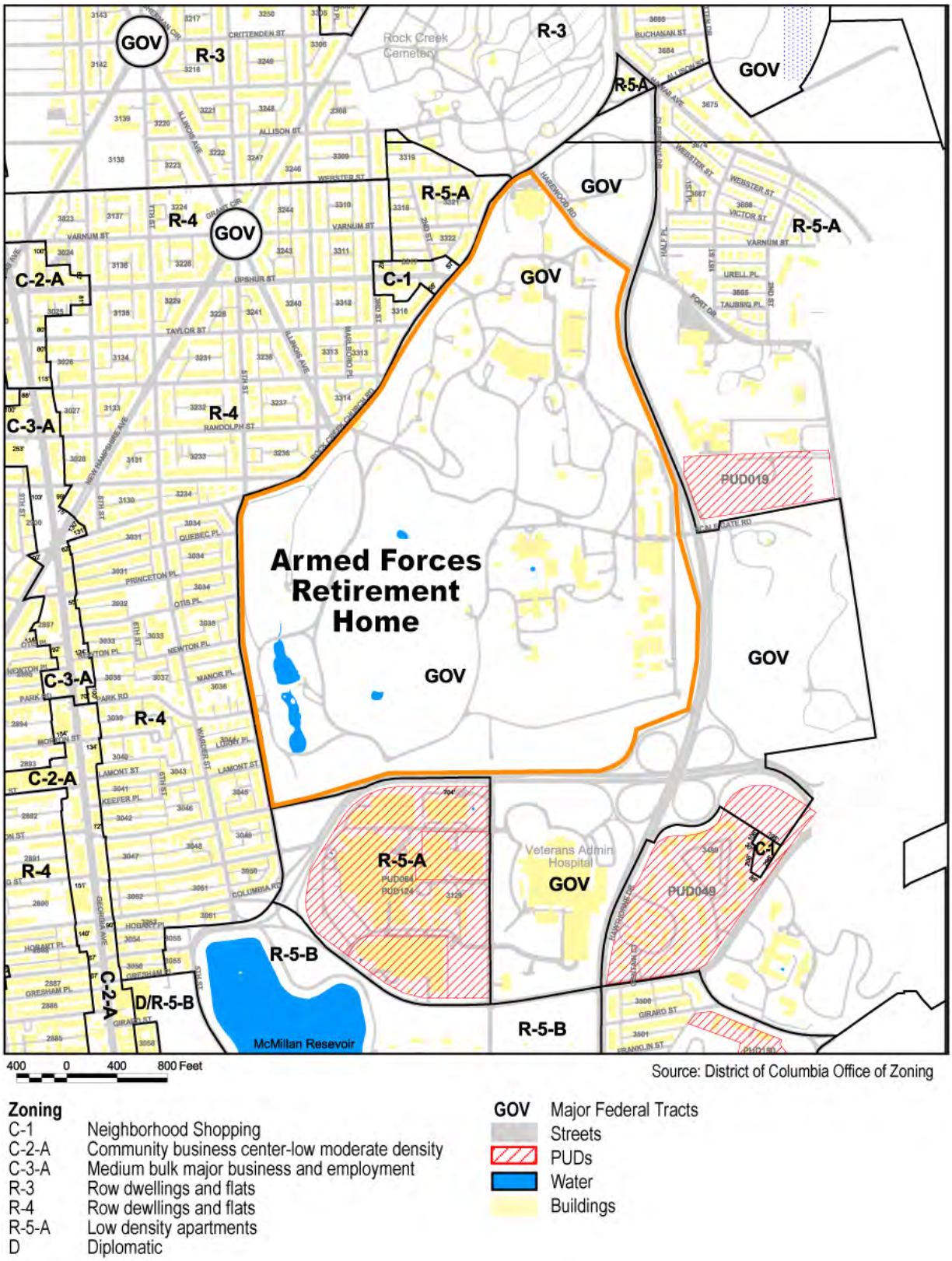

Figure 3-6: Zoning

3.2.5 Economy, Employment, and Income

According to the 2000 Census, 51.1 percent of working residents in the District of Columbia are in management/professional and related occupations. Sales and office occupations follow at 22.8 percent and service occupations at 16.1 percent. Of the working population in the District, construction, extraction, and maintenance occupations employ 4.8 percent; 5.2 percent are in production, transportation, and material moving occupations; and 0.1 percent are in farming, fishing, and forestry occupations.

The educational, health, and social services industry employs 23.6 percent of the working population in the study area. The public administration industry employs 14.7 percent of the working population. Professional, scientific, management, administrative, and waste management services industries employ 13.5 percent of the working population. The arts, entertainment, recreation, accommodation, and food services industry employs 9.6 percent of the working population and construction, manufacturing, and wholesale trade industries employ 10.6 percent. Other services, the retail trade, and transportation and warehousing/utilities industries employ 8.9 percent, 8.1 percent, and 4.8 percent, respectively. The remaining 6.2 percent are employed by the finance/insurance/real estate/rental and leasing and information industries.

As of August 2007, the District of Columbia's unemployment rate was 5.7 percent, higher than the national average of 4.6 percent (BLS, 2007). The median household income is $40,127, compared to the national average of $41,994.

Major employers in the vicinity of the project area include the VA, MedStar, Catholic University, Howard University, and AFRH-W. The closest shopping area is located on Georgia Avenue west of the site, approximately ¼ mile from the site. The Upper Georgia Avenue Great Streets Redevelopment Plan, which is part of the Great Streets Initiative, is a revitalization strategy for future development along the Georgia Avenue corridor from Decatur Street north to Eastern Avenue. The plan calls for ten key strategies for transforming Upper Georgia Avenue into a lively, walkable, shopping street that will serve adjacent residential neighborhoods (DCOP, 2007).

3.2.6 Taxes and Revenue

Taxes and revenues collected by the District of Columbia are discussed below:

Real Property Taxes: Properties owned and occupied by federal entities, such as AFRH, are not subject to real property taxes. However, private sector properties occupied by federal government agencies are subject to real property taxes on the improvements. Additional property tax revenue to the District of Columbia would occur only if a property were able to generate higher net operating income (which translates to additional assessed value). For Tax Year 2006, the tax rate for commercial office buildings is $1.85 per $100 of assessed value (DC CFO, 2007b). Assessed value is at 100 percent of market value (based on the value estimate by the Office of Tax and Revenue). However, the District has a triennial assessment process and there is the possibility of a property tax appeal by the property owner if a significant increase in assessed value occurred.

DC Code Section 47-1005.01, which provides for the assessment and taxation of leaseholds interests, possessory interests, beneficial interests, or beneficial use in property that is owned by the Federal government but occupied by a person using the property for a non-tax-exempt purpose, may be levied upon a private developer holding a ground-lease interest granted by AFRH for a non-tax-exempt use. As a result, the District of Columbia may be able to receive new revenues from taxes assessed based on the value of the real property whether or not AFRH retains ownership of the land. Taxes would be in accordance with the tax status of the lessee or user.

Personal Property Taxes: Personal property taxes are levied on the depreciated value of all personal property used in a trade or business (e.g., computers, vehicles) other than inventories held for sale. As of July 31, 2000, the Tax Parity Act of 1999 excludes the first $50,000 in taxable value and accelerated depreciation for computer equipment. In Tax Year 2006, the rate for personal property taxes is $3.40 per $100 of assessed value (DC CFO, 2007b). Because AFRH is a federal government agency, AFRH-W is exempt from personal property taxes.

Corporate Franchise and Unincorporated Franchise Taxes: The District's franchise tax is imposed on all corporations and unincorporated businesses doing business in the District of Columbia on the basis of the net taxable business income apportioned to the District. The franchise tax rate is currently 9.975 percent (DC CFO, 2007a).

Sales and Use Taxes: The District of Columbia imposes sales and use taxes on the purchase or consumption of tangible personal property or services within the District. Sales and use taxes are collected using a five-tier rate structure, as follows:

- General retail sales
- Alcohol (off-premise consumption)
- Restaurant meals, auto rentals, prepaid phone cards
- Commercial parking
- Hotel rooms

AFRH-W employees and visitors, and employees and visitors of tenants alike are subject to sales and use taxes on eligible purchases made in the District.

Individual Income Taxes: Individual income taxes are levied on all individuals who are domiciled in the District or who maintain a residence for a total of 183 or more days per year. For Tax Year 2006, the individual income tax is applied progressively to net taxable income as follows:

- $0-$10,000 (4 percent)
- $10,001-$40,000 ($450 + 6 percent excess above $10,000)
- $40,000 and above ($2,500 + 8.5 percent of excess above $40,000) (CFO, 2007)

AFRH-W employees who are residents of the District are required to pay individual income taxes.

3.3 Cultural Resources

3.3.1 Project Area History

Prehistoric occupation of the Washington D.C. region includes the Paleoindian Period (11,000 BC-9000 BC), Archaic Period (9000-1200 BC), and Woodland Period (1200 BC-European Contact).

Founded in 1851, AFRH-W is the sole remaining nationally-based institution for retired and disabled veterans of the United States military. AFRH-W was administered until 2001 by a Board of Commissioners composed of U.S. Army officers whose membership was mandated by Congress. As a result, numerous military officers who played key roles in the military history of the country, including such luminaries as General Winfield Scott, General William T. Sherman, General Philip Sheridan, and Surgeon General Joseph K. Barnes, have been associated with the

operation of AFRH-W. Established as a "military asylum[s] for the relief and support of invalid and disabled soldiers of the Army of the United States," it is funded using an endowment collected in lieu of pillaging by General Winfield Scott during his occupation of Mexico City in 1847. In 1851, the Board of Commissioners purchased the 255-acre country estate of prominent Washington banker George Washington Riggs to serve as the Washington branch of the Military Asylum. Sited outside the city's formal limits with panoramic views of the United States Capitol, the centerpiece of the property was an early Gothic Revival-style cottage known as Corn Rigs, which was supported by agricultural buildings, woodlands, pastures, and landscaping in the manner promoted by the influential aesthete Andrew Jackson Downing. Construction activities by the Military Asylum began in 1852 with the erection of a flagstaff, signaling the establishment of a military installation in Washington. By 1857, the first three masonry buildings, designed by Lieutenant Barton Stone Alexander in a Romanesque Revival style, were completed.

AFRH-W played a significant role in American political history particularly because of its association with President Abraham Lincoln. One of the four sitting United States presidents and their respective Secretaries of War known to have summered at AFRH-W, Lincoln served during one of the most turbulent periods in American history. The Civil War (1861-1865) broke out during his presidency and the issue of slavery and its abolition dominated American society in the first half of the nineteenth century. During the "heated season" of 1862 while residing at AFRH-W, Lincoln further developed his emancipation policy and worked on the final draft of the Emancipation Proclamation, launching the end of legalized slavery in the United States. Although AFRH-W was not the site of direct military action, the Union Army used its grounds as a Civil War signal post. As the second highest point in the District of Columbia, AFRH-W afforded President Abraham Lincoln the opportunity to view random skirmishes that occurred nearby while residing there.

The majority of the built resources at AFRH-W were constructed during five intensive building campaigns: 1852-1857, 1868-1881, 1887-1895, 1905-1910, and 1914-1920. Many of the principal buildings and structures are outstanding representations of their respective architectural styles and reflect dominant aesthetic vocabularies of public and private design. In 1868, the Board of Commissioners initiated a major landscaping program designed to enhance the property's character as a park that would be available to the public. From 1868 through 1883, the Board greatly expanded the land area of AFRH-W, until it extended over more than 500 acres. This expansion was coupled with the construction of new roads, landscape features, and buildings, including the expansion of its administrative and dormitory facilities, gatehouses, officers' quarters, a library, a chapel, garden structures, and an innovative hospital that drew

attention to the work of Surgeon General of the Army and Board president General Joseph K. Barnes. The agricultural activities of AFRH-W played a continuing role in its history. Although the original goal of self-sufficiency was never achieved, the agricultural activities were a key component of AFRH-W's character from its beginnings through 1951. Agricultural enterprises, dating to the Riggs' era, were expanded from one to three farms in the 1870s and by the twentieth century, the Board of Commissioners operated AFRH-W as a model urban agri-business. Known as a site of agricultural experimentation, the dairy farm was a nationally significant resource between 1907 and 1951 for its tuberculosis-free herd (which received the first USDA certificate awarded for such) and its use as an experimental facility to test breeding techniques and feed storage. The Board of Commissioners discontinued the dairy and farming activities in 1951 when it transferred several large parcels of land from the southern portion of the property to other federal agencies for the construction of two major hospital facilities.

3.3.2 Archeological Resources

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

This archeological study found that, despite its central location and historic significance, the extensive construction and grading activities associated with the operation of the Soldiers' Home during the 19th and 20th centuries has greatly altered many areas within AFRH-W. However, there are four previously identified historic archeological resources on the site: site of a post-1873 cross-gable, wood-frame building; site of the Corlise Cottage; site of the 1876 Barnes building (now demolished); and site of a possible late 19th-century building. Particular sections of AFRH-W may yet retain intact archeological remains dating to the prehistoric and historic periods. Therefore, AFRH-W has an overall moderate probability to contain intact cultural remains.

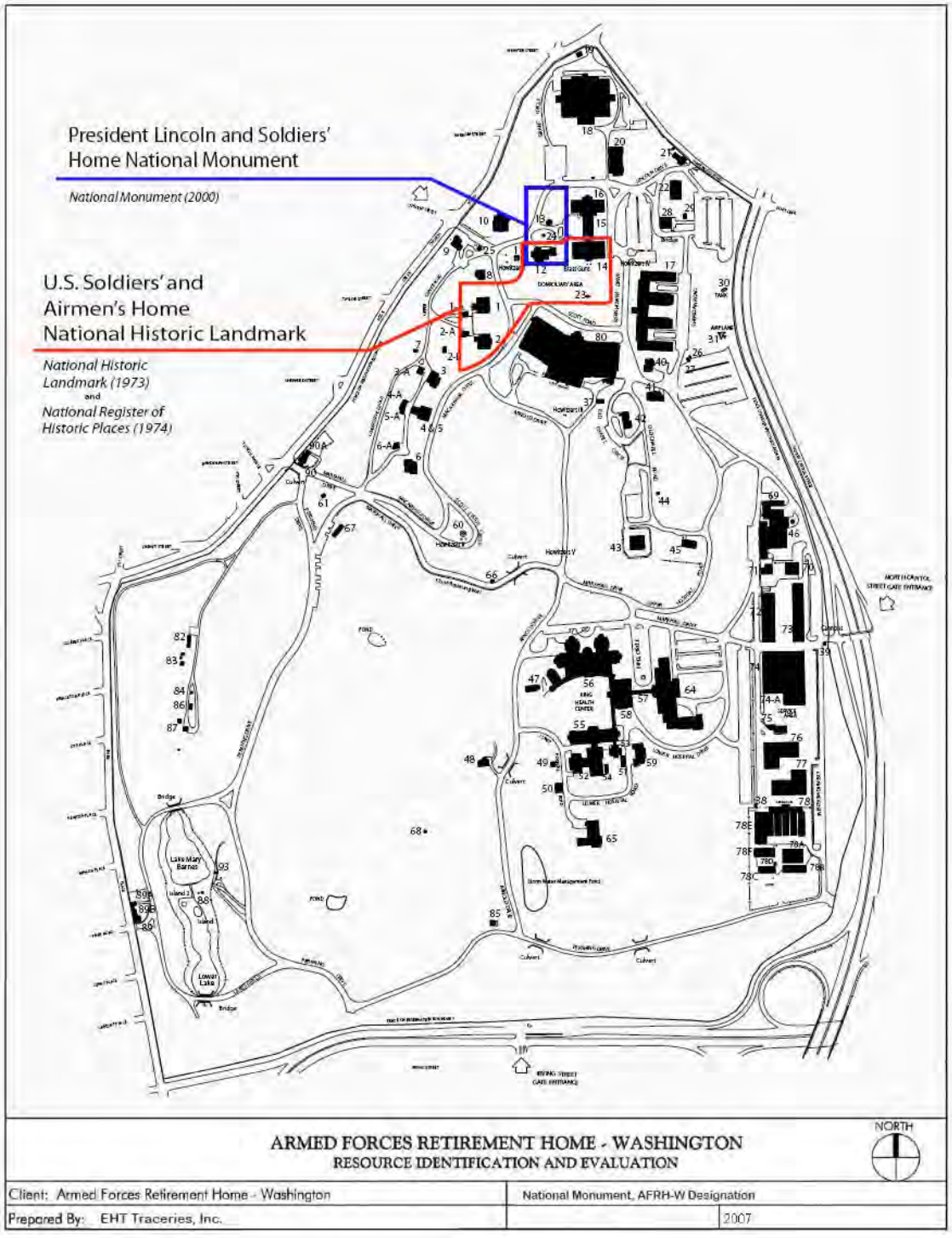

Figure 3-7: U.S. Soldiers' and Airmen's Home National Historic Landmark and U.S. Soldiers' and Airmen's Home Historic District (blue outline)

3.3.3 Historic Properties

In compliance with Section 110 of the National Historic Preservation Act, AFRH has identified historic properties within its control. In addition, in accordance with Section 106 of the NHPA, the Area of Potential Effects (APE) for historic properties has been identified to determine what resources may be affected by the Master Plan Alternatives. The APE includes the 272-acre Armed Forces Retirement Home – Washington site, as well as those properties immediately adjacent to AFRH-W with identified or potential historical significance (see Figure 3-8).

The APE for the proposed undertaking at AFRH-W includes those properties in the immediate vicinity of the site that are listed in or potentially eligible for listing in the National Register of Historic Places.

To the north, the boundaries of the APE include the Rock Creek Church Yard and Cemetery and the United States Soldiers' and Airmen's Home National Cemetery in their entirety. The APE boundaries are determined by the outer property lines of these two sites. To the west, the boundaries of the APE include a portion of the Petworth and Park View neighborhoods. Although the neighborhoods extend beyond the limits of the APE, the west APE boundary has been sited so as to include those areas that may be potentially affected by the proposed undertaking at AFRH-W. Due to topography and the dense, urban nature of development on the west side of AFRH-W, the proposed undertaking will not affect those portions of the neighborhood located outside the APE. On the east, the APE includes the entire Harewood Gate Lodge and East Grounds property. The APE boundaries are determined by the outer property lines of this site.

The topography of AFRH-W and its vicinity and the nature of the development on the east and south sides of AFRH-W limit the boundaries of the APE in these areas. To the east, north of the Harewood Gate Lodge and East Grounds, the presence of several large-scale, non-historic, institutional buildings along the east side of North Capitol Street restrict visibility of the proposed undertaking from beyond. Similarly, the large-scale medical facilities south of Irving Street are a solid visual barrier between the properties beyond and the proposed undertaking. Therefore, these areas have been excluded from the APE.

Properties within the APE that are listed in the National Register of Historic Places or potentially eligible for listing in the National Register of Historic Places are identified below.

District of Columbia Inventory of Historic Sites

The first designation came on November 9, 1964, when the District of Columbia named the "Corn Rigs-Anderson Building" (Lincoln Cottage, Building 12) and the Main Building in its entirety (Buildings 14, 15, and 16), District of Columbia Historic Landmarks in recognition of their outstanding national and local significance. These buildings were included on a list of approximately 300 local buildings recognized by the Joint Committee on Landmarks as outstanding features representing the District of Columbia.[2] This list became the basis for the current District of Columbia Inventory of Historic Sites, established in 1978 in compliance with District of Columbia's Historic Landmark and Historic District Protection Act.[3]

On March 3, 1979, the Joint Committee on Landmarks designated a portion of AFRH-W as an historic district and listed it in the District of Columbia Inventory of Historic Sites. The boundaries for the historic district encompass Lincoln Cottage (Building 12), Sherman Building (Building 14 only), Officer's Quarters One (Building 1), Officer's Quarters Two (Building 2), and the immediately adjacent land.

The District of Columbia Historic Landmark and Historic District Protection Act requires approval of alterations to buildings or districts listed in the District of Columbia Inventory of Historic Sites by HPRB.[4] However, since AFRH-W is a federally-owned property, the local landmark law does not apply. Instead, any alterations to the Lincoln Cottage (Building 12), any part of the Sherman Building (Buildings 14, 15, and 16), or any construction activity undertaken within the United States Soldiers' and Airmen's Home National Historic Site are subject to compliance with Sections 106 and 110 of the NHPA.

[2] The Joint Committee of Landmarks of the District of Columbia, a board supported by the District of Columbia, the Commission of Fine Arts, and the National Capital Planning Commission, established the initial list of District of Columbia landmarks in 1964.

[3] District Protection Act of 1978 (commonly referred to as District of Columbia Law 2-144).

[4] District of Columbia Historic Preservation Review Board (DC HPRB) serves as the District of Columbia's National Register of Historic Places State Review Board and advises District of Columbia State Historic Preservation Office (DC SHPO) in Section 106 cases.

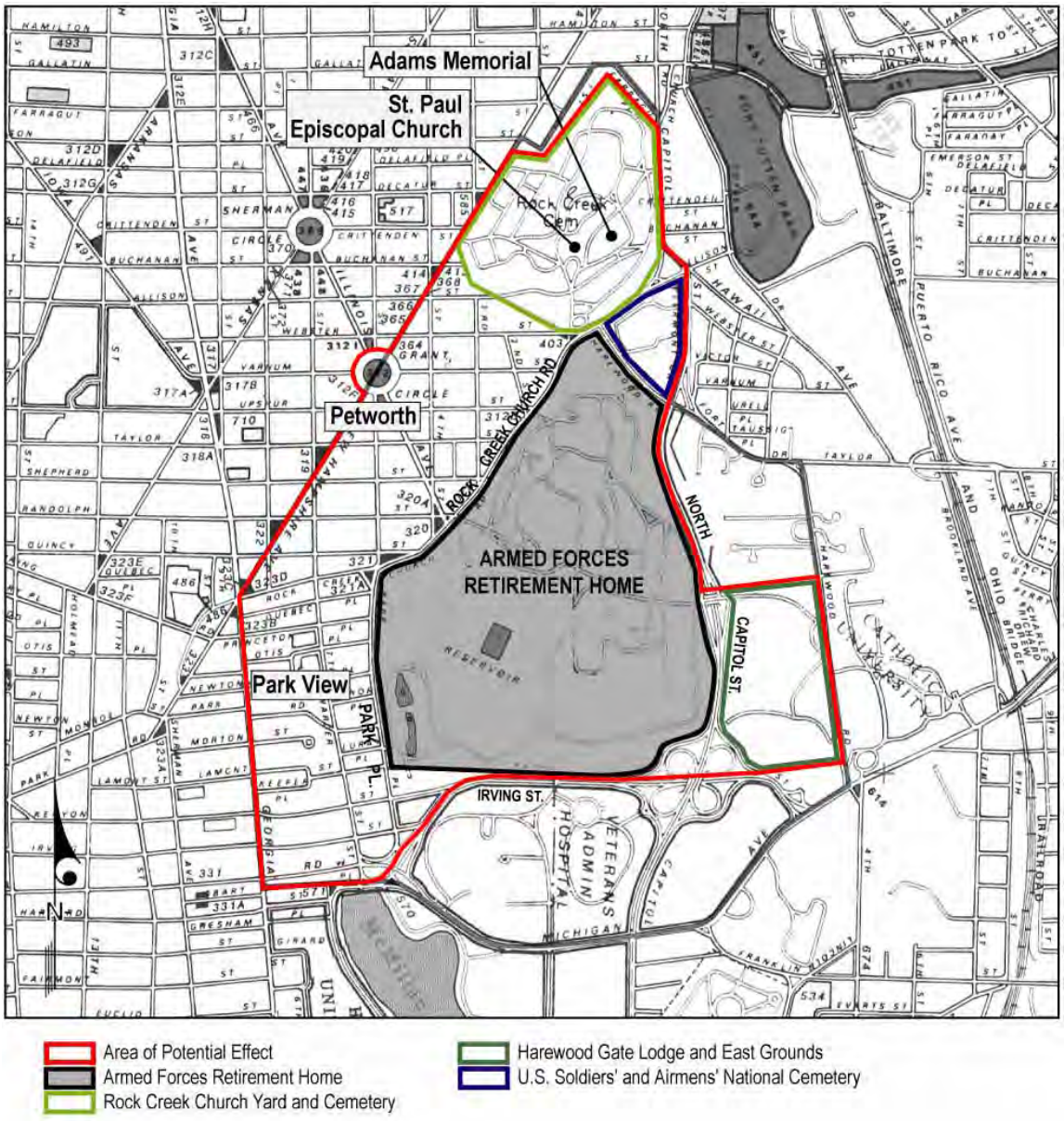

Figure 3-8: Area of Potential Effects

National Historic Landmark

On November 7, 1973, in recognition of AFRH-W's outstanding national significance, the federal government designated a portion of the property as a National Historic Landmark (NHL). This designation is documented with the concomitant listing of the small area in the National Register of Historic Places.[5] It is listed as "United States Soldiers' and Airmen's Home" and also can be found as the "United States Soldier's Home."

The designation focuses on the historical development during the initial years as illustrated through the earliest buildings at AFRH-W, but does address landscape issues and the rest of the property. The NHL recognizes four buildings at AFRH-W. These buildings, which are the first buildings occupied and/or built by AFRH, are Lincoln Cottage (Building 12), Main Building (Building 14 only - the oldest portion of the three-part Sherman Building, which is the southern portion completed in 1857 to the design of Lieutenant Barton S. Alexander), Officer's Quarters One (Building 1), and Officer's Quarters Two (Building 2) (See Figure 3-9). The boundaries adopted for the NHL are the same as those defined by the District of Columbia Historic District listing.

National Register of Historic Places

The DC SHPO determined the entire acreage of AFRH-W (known at the time as the United States Soldiers' and Airmen's Home) eligible for listing in the National Register in 1988, when the acreage exceeded 318 acres. The National Historic Preservation Act (NHPA) required that Section 106 consultations be conducted prior to the demolition of the Barnes Building and construction of an Intermediate Care Facility (ICF). During these consultations, DC SHPO, in consensus with AFRH, made the determination that the entire land area forming AFRH-W was eligible for listing in the National Register as an historic district. This determination is recorded in a staff report to the District of Columbia Historic Preservation Review Board (HPRB), acting as the State Review Board.[6] On February 11, 1974, a portion of the property was listed in the National Register of Historic Places. The designation boundaries correspond to those of the United States Soldiers' and Airmen's Home National Historic Landmark.

[5] National Historic Landmarks Program, *Code of Federal Regulations*, title 36, part 65, section 2(b), 2005 ed. [36 CFR §65.2(b)].

[6] See Appendices.

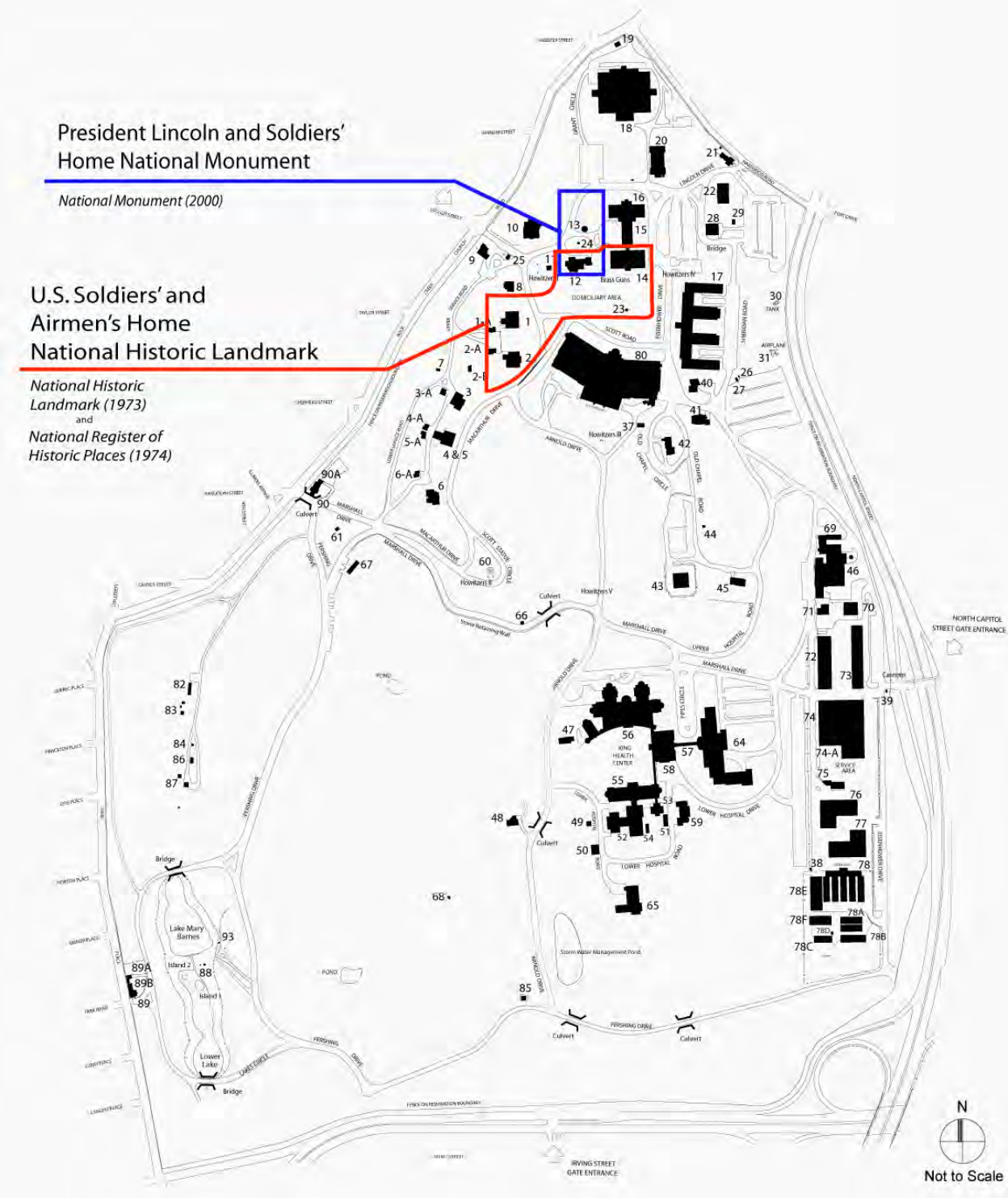

Figure 3-9: Historic Buildings within the National Historic Landmark and National Register Historic District

In October 2007, a National Register Historic District nomination was submitted for the entire 272-acre Armed Forces Retirement Home-Washington. The nomination documents that AFRH-

W is significant under the areas of Military, Politics/Government, Social History, Health/Medicine, Entertainment/Recreation, Architecture, Landscape Architecture, Agriculture, and Archeology. The two continuous periods of significance are (1) 1842 to 1851, when George Washington Riggs owned, improved, and occupied the farmland, and (2) 1851, when the Washington branch of the Military Asylum was established, to 1951 when the Board of Commissioners liquidated its remaining agricultural assets and disposed of the southern portion of the property. There are 250 resources at AFRH-W, including buildings, structures, objects, and sites. One hundred forty-four resources contribute to the areas and period of significance, while 106 resources are non-contributing.

Therefore, the Armed Forces Retirement Home-Washington Historic District is eligible for listing in the National Register of Historic Places as an historic district under National Register of Historic Places Criteria:

A. That are associated with events that have made a significant contribution to the broad patterns of our history;

B. That are associated with the lives of persons significant in our past;

C. That embodied the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; and

D. That have yielded, or may be likely to yield, information important in prehistory or history.

National Monument

President William Jefferson Clinton, in a public proclamation signed July 7, 2000, declared Anderson Cottage (Lincoln Cottage, Building 12) as a national monument to be known as the "President Lincoln and Soldiers' Home National Monument" in recognition of its outstanding national significance.[7] The national monument consists of a 2.27-acre rectangular area

[7] Presidential Proclamation, "President Lincoln and Soldiers' Home National Monument, Proclamation 7329," *Federal Register* 65, no. 135 (July 2000): 43673. [65 FR 43673].

extending north from Anderson Cottage and including the Bandstand (Building 11) and Water Tower (Building 13).[8]

A cooperative agreement was established between the National Trust for Historic Preservation and the U.S. Soldiers' and Airmen's Home, with two modifications (2001 and 2004), that enables the two parties to share in the preservation and rehabilitation of Lincoln Cottage.[9] AFRH and the National Trust for Historic Preservation entered into a programmatic agreement in 2005 that permits the National Trust to research and restore Lincoln Cottage, and to interpret and manage 2.3 acres that comprise the United States Soldiers' Home National Historic Landmark, including "a circa 1890 stone water tower, a circa 1890 summerhouse, and a circa 1906 bandstand."[10]

The *Resource Identification and Evaluation* identified contributing and non-contributing resources to the Historic District based on a Period of Significance from 1851 to 1944. The site was divided into eight Character Areas that are generally consistent with historical patterns of development of AFRH-W site (see Figure 3-10). Within these Character Areas, a total of 355 individual and site-wide resources were documented. Individual resources include buildings, structures, and objects that are self-contained resources surveyed individually on the property. Site-wide resources are either individual resources present in multiple locations on the site or Cultural Landscape features that are found throughout AFRH-W. The study identified a total of 122 contributing resources, 203 non-contributing resources, and 30 unknown resources (EHT Traceries, 2004).

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[8] The President Lincoln and Soldier's Home National Monument was created pursuant to the Antiquities Act of 1906 (*Antiquities Act of 1906*. Public Law 59-209. *U.S. Statutes at Large* 34 (1906): 225. Codified at 16 USC §431, et. seq. [34 *Stat.* 225; 16 USC 431]).

[9] "Cooperative Agreement Between the National Trust for Historic Preservation and The U.S. Soldiers' and Airmen's Home," November 1999; "First Modification to Cooperative Agreement Between the National Trust for Historic Preservation and The U.S. Soldiers' and Airmen's Home)," May 2001; "Second Modification to Cooperative Agreement Between the National Trust for Historic Preservation and the Armed Forces Retirement Home (formerly The U.S. Soldiers' and Airmen's Home),' 2004. See Appendices for copies of the agreements and modifications.

[10] "Programmatic Agreement Among Armed Forces Retirement Home, National Trust for Historic Preservation in the United States and the District of Columbia Historic Preservation Office Regarding the Preservation of Historic Propertied Pursuant to a Cooperative Agreement Between the National Trust for Historic Preservation in the United States and the Armed Forces Retirement Home," April 2005. The programmatic agreement does not explain the inconsistency between the 2.27 acres of the National Monument and 2.3 acres used in the programmatic agreement.

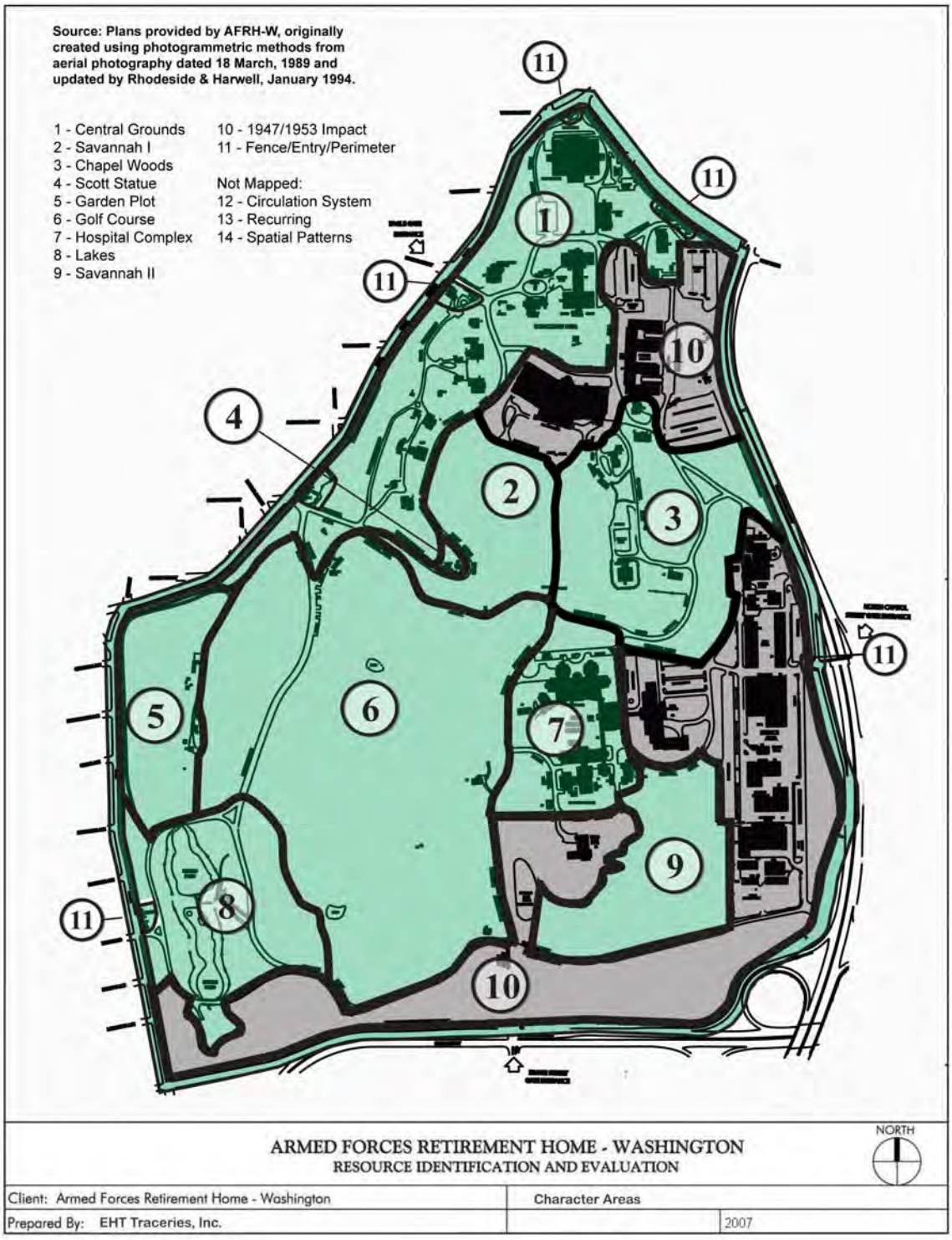


Figure 3-10: AFRH-W Character Areas

Character Area 1: Central Grounds.

***Assessment:* Key**

The Central Grounds Character Area is the historic core of Armed Forces Retirement Home-Washington (AFRH-W or Home).This area includes "Corn Rigs," (Lincoln Cottage Building 12) the 1842 country retreat of George Washington Riggs. The Riggs farm, traversing over most of the fourteen Character Areas of AFRH-W, originally consisted of cultivated fields, agricultural buildings, springs and streams, and woodlands. Soon after the Military Asylum took possession of the Riggs property in 1851, the first three buildings constructed for the institution were located within close proximity to Riggs's former dwelling. These include the Main Building (Sherman Building, Building 14), Quarters One (Building 1), and Quarters Two (Building 2), all constructed by the Asylum's first builder Gilbert Cameron.

This Character Area includes locally and nationally designates historic sites and resources:

- Soldiers' Home National Historic Site (District of Columbia Inventory of Historic Sites);
- Soldiers' Home, Main Building/Sherman Building (District of Columbia Inventory of Historic Sites);
- Anderson Cottage (District of Columbia Inventory of Historic Sites)[11];
- United States Soldiers' and Airmen's Home National Register Historic District;
- United States Soldiers' Home National Historic Landmark; and
- President Lincoln and Soldiers' Home National Monument.

The Central Grounds contains the property's earliest and most significant buildings. The buildings, structures, and landscape elements retain a high level of integrity, representing the tenure of George W. Riggs and the establishment of the Military Asylum.

Improvements made during the late nineteenth and early twentieth centuries transformed the northern portion of the Central Grounds into a quadrangle bounded by the Main Building on the south, Stanley Hall (Building 20) to the east, the former Sheridan Building (demolished) to the west, and Grant Building (Building 18) to the north. Construction of the Administration

[11] Anderson Cottage is more commonly referred to as Lincoln Cottage (Building 12).

Building (Building 10) and the Security Building (Building 22) improved the eastern and western edges of the quadrangle.

Additional officer's quarters – Quarters Three (Building 3), Four and Five (Buildings 4-5), and Six (Building 6) – were constructed in the southern portion of Central Grounds during two building campaigns in 1871 and 1905-1907. Fenced yards and outbuildings, including the wood-frame tool shed (Building 2B) used by builder Gilbert Cameron, are located in proximity to the officers' quarters.

Boundaries

The Central Grounds Character Area is approximately 35 acres. The northwest and northeast boundaries of the property coincide with those of the Central Grounds, with Rock Creek Church Road to the northwest and Harewood Road to the northeast. The 1876 masonry wall and iron fence marks this boundary (see Fence/Entry/Perimeter Character Area). Within the property MacArthur Drive, Marshall Drive, Scott Road, Eisenhower Drive, and Sheridan Road form the internal boundaries of Central Grounds.

Character Area 2: Savannah I

Assessment: **Supporting**

The Savannah I Character Area is a twelve-acre area of open land defined in the late 1860s by some of the institution's earliest roads. Sloping topography characterizes this area, rising to a plateau at the statue of General Winfield Scott (Building 60, see Scott Statue Character Area). The area's open space and natural spring are also significant landscape resources in Savannah I.

Historic maps show that this area was open throughout the nineteenth and twentieth centuries. The Savannah I Character Area was utilized for the cultivation of ensilage for the institution's livestock (mainly its dairy herd), and thus is associated with the agricultural history of AFRH-W. Because of its close proximity to the institution's primary buildings in the Central Grounds Character Area, the dairy herd did not pasture in this area, and grass grown here was most likely cut and transported to the dairy farm to the south.

Around the turn of the twentieth century, the Board of Commissioners established the first golf course at AFRH-W. Historic maps do not indicate the exact locations of the original golf courses; however, they were most likely located on the open space in Savannah I and/or on the present location of the Scott Building (Building 80), next to the former tennis courts (see 1947/1953 Impact Character Area). Documentation indicates that the original course was crude

in form since the governor of AFRH-W suspended play regularly until hay was cut from the fairways. A grass-covered meadow punctuated by shrubs and small trees has replaced the agricultural grass; however, the natural topography, openness of the area, and bordering historic roads ensure its integrity of setting, feeling, and design.

Boundaries

MacArthur Road defines Savannah I Character Area to the west, and the original (western) portion of Marshall Drive marks the area's southern boundary. An original portion of Arnold Road, dating from as early as 1867, forms the eastern boundary. A portion of Arnold Road was realigned in the 1950s to allow for the construction of the Scott Building (Building 80) and now creates the northern boundary of Savannah I.

Character Area 3: Chapel Woods

***Assessment:* Significant**

The Chapel Woods Character Area has been forested since the federal government acquired the property from George Washington Riggs in 1851. The area termed the Chapel Woods has been a coherent land use unit at least since the 1860s, bounded by Arnold Drive (formerly Central Drive), Upper Hospital Road (formerly Bessie's Drive), and Eisenhower Drive (formerly East Drive). It covers approximately 20 acres of AFRH-W. A detailed 1851 plat map of Riggs's property depicts the Chapel Woods Character Area as "Wood Land." Subsequent nineteenth- and twentieth-century maps also show this part of the property as forested.

The most notable built resource in the Chapel Woods Character Area is Rose Chapel (Building 42), completed in 1870. Old Chapel Circle surrounds the chapel with woodlands along the perimeter. Freestanding resources such as the Gardener's Quarters (Building 40), the Secretary to the Quartermaster's Quarters (Building 41), and the Engineer's Quarters (Building 45) are located to the south of the chapel. Early transportation infrastructure within this area includes a paved path leading from the Central Grounds Character Area to Barnes Hospital (1872, demolished circa 1952) as well as Old Chapel Road and Old Chapel Circle.

Boundaries

The Chapel Woods Character Area follows the landform created by a rise in the natural topography, the mature woodlands, and historic street patterns dating to the first decades of the institution's existence. The vegetation, as seen in the old oak trees and laurel understory along the edge of the boundary, is in keeping with the historic descriptions, following the pattern and

characteristics of the land as depicted in maps published in the 1860s. The western boundary goes beyond Arnold Drive, an historic road established in 1867, and conforms with the drop in topography and continued forestation that extends beyond the road towards the Savannah I Character Area adjacent to the west. To the east, the boundary roughly conforms to the edges of the wooded areas, which are consistent with the wooded areas present on the 1867 map. This eastern boundary encompasses the historic Upper Hospital Road and Eisenhower Drive, as well as a patch of woods just north of Heating Plant (Building 46). The north boundary is adjacent to the modern parking lot to the east and follows Upper Hospital Road until it joins with Old Chapel Circle.

Character Area 4: Scott Statue

***Assessment:* Key**

The Scott Statue Character Area, located to the southwest of the Savannah I Character Area, is an important element in the historic designed landscape of AFRH-W. The life-sized statue of General Winfield Scott, an early proponent for founding the Military Asylum and benefactor of the institution, distinguishes the Scott Statue Character Area. AFRH-W's Board of Commissioners engaged artist Launt Thompson to sculpt the statue, which was placed on the grounds in 1873. At an elevation of 300 feet, the statue is located along the southern terrace of the plateau on which the institution's original buildings were sited. Prior to the construction of the Scott Building (Building 80) in 1954, viewers at the statue's base could see the upper floors and tower of the Sherman Building (Building 14) to the north. The view of the dome of the U.S. Capitol to the south has been retained.

Boundaries

The Scott Statute area is circumscribed by Scott Statue Circle, an extension of MacArthur Drive.

Character Area 5: Garden Plot

***Assessment:* Supporting**

The Garden Plot Character Area is located along the western boundary of the property. Maps published as early as the 1860s depict these fields as agricultural. Although it is unclear what grew in this location prior to the twentieth century, archival documents indicate that these fields were once used to grow alfalfa for the institution's dairy herd. When the Board sold the dairy herd in 1951, members of AFRH-W, including resident staff, used the Garden Plot as a community garden, growing a variety of vegetables for their own use and for competition. In the

third quarter of the twentieth century the field was reduced in size when the eastern portion was turned into a driving range for the new golf course. Consequently, the Garden Plot Character Area is composed of only nine acres of the original horticultural/agricultural land used by AFRH-W until 1951.

Boundaries

The western boundary of the Garden Plot coincides with the western boundary of AFRH-W formed by Park Place and marked by an 1899 iron fence. The driving range in the Golf Course Character Area forms the eastern boundary, while Lakes Circle and the northern portion of the deciduous forest in the Lakes Character Area form the border to the south.

Character Area 6: Golf Course

***Assessment:* Minor**

The Golf Course Character Area encompasses a central portion of AFRH-W, as well as the western section of abandoned agricultural fields to the immediate west. The southern half of the current golf course was associated with the agricultural activities of AFRH-W until 1951 when the Board sold AFRH-W's dairy herd. An aerial photo from 1945 indicates that the original golf course, most likely located in the Savannah I Character Area, extended into the northern portion of the current golf course, with tree lines marking at least two holes. These holes largely correspond with the eventual layout of the present golf course, which is identified for the first time on a 1952 existing conditions map of the campus. Later renovations in 1956, 1968, and 1991 further developed the course's landscaping, added two water hazards, and reconfigured the course. The Board authorized removal of trees seen in the 1945 aerial photo, introducing vegetation along the fairways. The western portion of this Character Area, now used as a driving range, was formerly part of the historic alfalfa fields used for AFRH-W's Dairy Herd until 1951. The eastern portion of these fields comprises the Garden Plot Character Area and is presently used as a community garden.

The Pershing Drive street trees and a culvert under Arnold Drive are contributing resources and structures in the Golf Course Character Area, improved by several secondary golf course-related resources dating from the mid- to late-twentieth-century.

Although of the present use of the Golf Course Character Area represents AFRH-W's long history of providing recreational opportunities to its residents, the change in land usage,

topography, and vegetation during the 1950s construction of the current golf course compromises the integrity of the Character Area.

Boundaries

The Golf Course Character Area is bounded by Marshall Drive to the north, Arnold Drive to the east, and an unnamed service road to the west. Pershing Drive also forms the south and southwest boundaries except where a small wooded portion in the southwest corner of the New Golf Course has been included in the Lakes Character Area.

Character Area 7: Hospital Complex

***Assessment:* Significant**

The Hospital Complex Character Area is located on a plateau of land sloping gently to the south of the Chapel Woods Character Area. This area is where the institution's medical facilities have been located since the initiation of separate facilities for hospital use at AFRH-W in the early 1870s. The first hospital, Barnes Hospital (demolished circa 1952), was constructed in 1872 and first appears on a map published in 1877. The Board of Commissioners had additional medical and support buildings constructed in proximity to the first hospital throughout the remainder of the nineteenth century and into the twentieth century. In 1919, U.S. Army architect Alfred Granger prepared a Master Plan for AFRH-W, and the hospital complex is the area that best reflects his design intent for the institution. The group of early-twentieth-century Colonial Revival-style buildings and the surrounding landscape elements framing the area create a cohesive unit, despite the replacement of the LaGarde Building in 1992. Although constructed for hospital purposes, the Pipes Building (Building 64) and the Ignatia Guest House (Building 65) are associated with the 1947 and 1953 Master Plans, which recommended the demolition and replacement of almost all extant buildings on the campus. As such, the massing, scale, and architectural details of the Pipes Building and Ignatia Guest House are inconsistent with that of the earlier buildings in the hospital complex and are included in the 1947/1953 Impact Area.

Boundaries

Covering approximately twelve acres, the Hospital Complex Character Area's boundaries roughly conform to one of the north-south ridges that mark the property's natural topography. The topography, along with the patterns of historic roads and the placement of historic buildings, establishes the boundaries of the Hospital Complex Character Area. Arnold Drive forms the western boundary, separating the Hospital Complex from the existing golf course. Marshall

Drive and Upper Hospital Road create the boundary to the north. The eastern boundary runs along the east elevation of the historic Colonial Revival-style Hospital Mess Hall and Auditorium (Building 57) that faces the hospital quadrangle, cutting through the connection with the non-contributing Pipes Building. The boundary loops around to the south and west along the Lower Hospital Road, extending to Arnold Drive and capturing the bandstand and storehouses at the edge of the plateau.

Character Area 8: Lake

***Assessment:* Significant**

The Lakes Character Area is located in the southwestern corner of the property, bounded on the west by Park Place and to the east by the golf course. The Character Area consists of property purchased from George W. Riggs in 1851 and land acquired in 1869 from neighboring landowner A.C. Whitney. An unnamed stream that traveled through this low-lying land created excess surface-water and mired agricultural production in this area. However, the Board of Commissioners saw the condition of the land as an opportunity to create water features as part of a larger designed landscape program for the property. With a final order and specifications provided by the Board in July 1869, the governor of AFRH-W was authorized to "construct as large a pond as the circle of willows down to the cedars will admit, the earth thus removed to be spread upon the surface around in a suitable manner to facilitate drainage into the stream below."[12] This pond, created by the damming of the unnamed intermittent stream, was named Lake Mary Barnes in honor of Surgeon General Barnes's wife Mary Fauntleroy Barnes. By the early twentieth century, the artificial pond was known as "Lake Mary."

The Board of Commissioners authorized the excavation of a second lake in August 1870 in conjunction with a large-scale road-building project. They ordered the governor to make "a second pond north of the proposed road and south of the first pond, but of the width and depth, the highest water level of which should not exceed the height of the crowns of the trees on the east bank." In 1871, the Board ordered modifications to Lake Mary when it authorized the governor to cut down the coping wall of the upper lake, using the same outlet, to widen the fall of the water and cause it to flow over the dam "like a cascade in a natural way."[13] Throughout

[12] MB 1, 8 July 1869, 253.

[13] "May 6, 1871, B.C. #1, p. 322," Elizabeth L. Myers, Notes on History of Soldiers' Home, 1923-1925, fol. 2 of 4, Entry 46, RG 231, National Archives, Washington, D.C.

the late nineteenth century and into the twentieth century the lakes were stocked with waterfowl (swans and ducks) and fish for the residents to catch.

The landscape design of the Lakes Character Area incorporated two bridges from the 1870s and 1880s. Other built resources associated with the creation of the lakes are the outfall drainage ditch, water tap, and sluice, all dating from the late nineteenth century. Also part of the designed landscape plan was the introduction of deciduous perimeter plantings, designed woodlands that include Bald Cypress and Yew trees, and two small islands in the south lake created in 1870. The islands are encircled by stone retaining walls and feature several small duck houses.

An open stand flanks Pershing Drive at the east edge of the Lakes Character Area. This land was densely forested prior to the Military Asylum's purchase of the property in 1851, and the portion of forest east of Pershing Drive remained intact throughout the late nineteenth and early twentieth centuries. In the 1950s, the creation of the golf course to the east resulted in the loss of trees along the eastern side of the stand; however, a substantial portion of the open stand remains on both sides of Pershing Drive.

Boundaries

The Lakes Character Area comprises approximately 12 acres. The western boundary of AFRH-W, formed by Park Place, coincides with the western border of this Character Area. Lakes Circle encircles the two ponds, with Pershing Drive running north to south along the eastern side of the Character Area.

Character Area 9: Savannah II

Assessment: **Significant**

The Savannah II Character Area is a grass field with moderate changes in topography for hydrology, specifically the burial of a natural stream and creation of a culvert. This area is located on the south slope of the northern ridge on which the hospital buildings are located. Once delineated by two of the institution's natural streams, AFRH-W's dairy herd historically used the open space as a grazing pasture. The open character of the area has remained intact throughout the history of AFRH-W. However, after the sale of the dairy herd in 1951, the land ceased to be agricultural in use. Although the land mainly serves as open fields today, recreational fields occupy a small portion of the Character Area.

Boundaries

The Savannah II Character Area covers approximately thirteen acres. The storm water management pond and hospital woods bound the Character Area to the west, and the 1950s service area bounds the Character Area to the east. Lower Hospital Road forms the northern border, while Pershing Drive creates the southern border.

Character Area 10: 1947/1953 Impact

Assessment: **Non-Contributing**

The 1947/1953 Impact Character Area is a large area primarily along the eastern and southern edges of the campus dramatically affected by the implementation of the 1947 and 1953 Master Plans. The area is characterized by large-scale, multi-story, mid-twentieth-century masonry buildings and large surface parking lots to the north, numerous small-scale utilitarian structures and the multi-storied Pipes Building (Building 64) to the southeast, and open land to the south. A majority of the construction in this area represents the expansion efforts of the Master Plans, which called for the demolition and replacement of almost all existing buildings and structures on the campus. Although all of the elements of the Master Plans were not executed, the new construction that did occur disregarded the original road patterns, altered the traditional scale and feel of the campus, and departed significantly from the stylistic character of the original buildings.

The Scott Building (Building 80) dates from 1954 and is located on land previously occupied by the tennis court and possibly by the original golf course. To accommodate this construction, the Board of Commissioners directed the realignment of several historic roads, including Arnold Drive to the south and Scott Road to the north. Today, the Scott Building blocks the historic view from Lincoln Cottage (Building 12) to the U.S. Capitol and interrupts the visual connection between the Central Grounds Character Area and the Hospital Complex Character Area. The 1960 Sheridan Building (Building 17) is located on the site of several demolished historic buildings including greenhouses dating from the turn of the twentieth century. The creation of parking lots associated with the new construction also resulted in the demolition of historic buildings, including King Dormitory.

The southeastern section of this area is characterized by small scale, utilitarian structures that were constructed in the late 1950s to house maintenance activities, equipment, and supplies. These buildings replaced the original service area, which was originally located in the northeastern section of the property and razed as part of the 1953 Master Plan. The 1907 to 1909

Heating Plant (Building 46) is the only building in this area that predates the implementation of the Master Plans and exists today as AFRH-W's most visible historic resource along the North Capitol Street corridor.

The southern portion of this Character Area is all that remains of agricultural pastures and meadows that existed within AFRH-W's property south of Pershing Drive. The Board of Commissioners reduced AFRH-W's farming activities throughout the course of the twentieth century and closed the dairy farm in 1951 when much of the South Pasture was sold to other federal agencies. The portion of the pasture that remained was left open and presently acts as a buffer between the primary campus and Irving Street to the south.

Boundaries

The 1947/1953 Impact Character Area is consistent with the large expanse of land along the eastern and southern edge of AFRH-W. At the northeast, it incorporates the Scott Building (Building 80) and the Sheridan Building (Building 17), as well as their associated paths and parking areas. Along the east edge of the property, the Character Area includes all of the 1950s service area along the east boundary of AFRH-W, as well as the Heating Plant (Building 46), Pipes Building (Building 64), and the associated paths and parking areas. The northeast and east portions of this Character Area are not contiguous. The open land of the southern portion of the 1947/1953 Impact Character Area is bordered on the north by Pershing Drive and on the south by the southern boundary of AFRH-W, which is contiguous with Irving Street.

Character Area 11: Fence/Entry/Perimeter

***Assessment:* Supporting**

The Fence/Entry/Perimeter Character Area consists of perimeter fencing along the boundaries of AFRH-W, gates at each of its active and abandoned entrances, and buildings and structures associated with those gates. Although the boundaries of AFRH-W changed frequently during its early years and again in the mid- and late twentieth century, the property's perimeter is a character-defining feature. The Board of Commissioners ordered fencing constructed along a boundary once no further acquisitions were expected. The first documented construction of fencing dates from July 1855, when the executive committee of the Board ordered "a good and substantial board [wooden] fence be made along the road from Carmack's garden to the lower

entrance gate of the Military Asylum."[14] This board fence ran from the present intersection of Park Place and Rock Creek Church Road to what later became the Ivy Gate.

Authorized in May 1859, construction of a new gate, lodge, and guardhouse at the main entrance was completed in 1860.[15] The structure, now recognized as Ivy Gate Lodge (Randolph Street Gate House, Building 90), was designed in the Gothic Revival style and constructed by local carpenters Entwistle and Barron. In 1869, the Board gave the acting governor the authority to construct another fence and "suitable gate-way with posts and double gates, proper fastenings, etc." at the terminus of the new road from Seventh Street.[16] The construction of the fence and gate corresponds with the construction of the Park Road Gate House (Building 89).

The Board charged architect Edward Clark with designing and supervising the construction of several new buildings during the early 1870s, and required him to focus some of his attention on the grounds. Clark's tenure coincided with construction of a majority of the gate lodges: the Italianate-style Main Gate Lodge (Eagle Gate Lodge, Building 9) was completed in 1872; Cemetery Gate Lodge designed in the Gothic Revival style by John Smithmeyer (Building 21) was constructed in 1873-1876; and Park Road Gate Lodge (Building 89) was erected in 1877 with elements of the Tudor Revival style. The North Gate is contemporaneous with the construction of the Grant Building (Building 18) from 1910 to 1912. The gate cut through the perimeter property wall specifically to provide vehicular access to the Grant Building. The North Gate Lodge, constructed in 1915, was the last gatehouse built at AFRH-W prior to the 1947/1953 Master Plan era.

Because of the inadequate grading of Rock Creek Road, the existing fencing along the northwestern boundary was continuously "washing away." In 1876, the Board of Commissioners authorized a large-scale construction project to erect a "permanent stone and iron fence." The fence was to extend northeast from the intersection of Rock Creek Church Road and Park Place, along the northwestern boundary of the property to the intersection of Harewood and Rock Creek Church roads, and then southeast along the property's eastern boundary to its intersection with what is now North Capitol Street. The fence originally contained nearly 3,000

[14] MB 1, July 1855.

[15] "Index to Home Grounds," USSAH Real Property, 1994, Box 4, Entry 46, RG 231, National Archives, Washington, D.C.

[16] MB 1, 8 July 1869.

perches of stone wall, 121 brick piers, 4,600 feet of stone coping, 127 stone caps for the piers (including six bluestone caps for lodge piers), 96 feet of circular coping, and the two bronze eagles.[17]

In 1891, the city extended North Capitol and First streets from downtown to AFRH-W, prompting a public call for a new entrance to the south to allow for more convenient visitor access.[18] The Board responded by opening a temporary gate and approving the construction of new gate (to be a replica of the gate at the National Cemetery at the Presidio in San Francisco, California), adjacent fencing, and gatekeeper's lodge at First Street.

In 1899, a substantial and ornamental wire fence was erected on the eastern and western boundaries of the grounds and on the southern boundary along Michigan Avenue. The southern length of the fence, along with the First Street gate and gate lodge, were removed when the Board sold the southern portion of the property in the 1950s. The western section of the fence remains at AFRH-W, and the eastern portion of the fence is extant along the former eastern boundary of the property on land de-accessioned to The Catholic University of America in 2004.

With the perimeter of AFRH-W constant, no new fencing, gates, or gatehouses were constructed between 1915 and 1951. In the 1950s, Irving Street was constructed, a large southern portion of the property was sold, and North Capitol Street was extended northerly through the eastern section of AFRH-W. At this time, a chain-link fence was installed along the property's new boundaries and along North Capitol Street.

Boundaries

The perimeter of AFRH-W encloses 272 acres and is approximately 2.75 miles in length. This area also includes the footprints of the buildings and structures constructed as gatehouses and lodges in irregular elliptical areas at each of the gates, both abandoned and functioning.

[17] Senate Committee on Military Affairs, *Examination into the Affairs of the United States Soldiers' Home, Washington,* testimony of Joseph K. Barnes, 83.

[18] "New Entrance Needed," *The Washington Post*, 31 March 1891, p.5. "Southern Gate to Soldiers' Home," *The Washington Post,* 26 April 1891, 6.

Character Area 12: Circulation System

Assessment: **Supporting**

The Circulation System Character Area includes AFRH-W's complete system of vehicular roads. The earliest transportation structures were internal farm roads linking domestic areas of the Riggs farm with agricultural fields, outbuildings, and a cluster of farm workers' houses in the southern portion of the property. The former Riggs farm also had at least two roads linking the property's interior to existing county roads. Improvement to the institution's transportation system began prior to the Civil War and intensified significantly in the following years, especially after 1868 when the grounds opened to the public. To accommodate a transition from equine to automobile travel in the early twentieth century, roads and entry gates were widened to facilitate vehicular traffic flow. In mid-twentieth century, major changes to some portions of the system occurred in response to the implementation of the 1947 and 1953 Master Plans. Realignment of roads occurred again in 1992 to accommodate the construction of the new LaGarde Building (Building 56).

Despite twentieth century changes, the Circulation System Character Area continues to represent the nineteenth-century landscape principles that guided the development of the designed landscape. Many of the roads and paths and complementary landscape remain intact to their nineteenth-century appearance, representing the Board's commitment to maintaining the pastoral character of the property while providing both equine, vehicular, and pedestrian circulation throughout the grounds. Some elements of the system have been adversely altered or newly constructed, and may not contribute to the property's significance as individual resources; however, the Circulation System as a whole contributes to AFRH-W's significance as an important element of the mission of the Military Asylum and the designed landscape.

Boundaries

The Circulation System Character Area is comprised of the property's internal roads. These engineering elements occur within defined corridors throughout the property.

Bridges, culverts and landscape elements associated with the roads, while connected to this system and considered part thereof, are recorded with their respective Character Areas.

Character Area 13: Recurring Resources

Assessment: **N/A**

The Recurring Resources Character Area is comprised of resources not confined to a single Character Area. Individual resources within the Recurring Resources Character Area include the property's channels and drains, which span several Character Areas within the property. A majority of the resources within this Character Area are groups of secondary structures and objects that share a similar purpose or function. The resources within these groups do not individually merit recognition, but as a group represent the vital functions and operations of AFRH-W. Recurring resources include small-scale concrete culverts, historic planting urns, secondary stone and concrete retaining walls, late-twentieth-century commemorative markers, security- and maintenance-related objects, internal fencing, lampposts, other landscape-related resources, and objects associated with the golf course and various recreational activities within AFRH-W. This Character Area also includes the modern paths and associated resources that make up the secondary circulation system on the property.

Boundaries

The Recurring Resources Character Area is contiguous with the boundaries of AFRH-W, as the resources are not confined to a single Character Area.

Character Area 14: Spatial Patterns

Assessment: **Significant**

The Spatial Patterns Character Area is comprised of interdependent property-wide resources that characterize AFRH-W as a whole. These resources predate the Military Asylum and include the property's topography, spatial organization, and view sheds. During the period of significance (1842-1951) defined for AFRH-W, these resources were instrumental to the retention of a relationship between the property's built resources and sites during periods of development and expansion and have collectively shaped the physical attributes of the campus throughout its history.

Before the establishment of the Military Asylum in 1851, George W. Riggs chose the location for his house (Lincoln Cottage, Building 12) on the hill that afforded views of the city to the south. AFRH-W itself took advantage of the high points throughout the site, developing the ridges and plateaus for residential uses. Smaller structures, such as the Officers' Quarters and Rose Chapel, were placed on the forested ridges, while the large-scale dormitories and hospital

buildings made use of the flat plateaus that sit uphill of open fields and afford expansive views to the south. Although nearly all of the natural streambeds at AFRH-W have been diverted into channels, deltas can still be seen where streams used to outlet into the low-lying areas on the property, which in turn, have been converted into manmade ponds or allowed to remain in a natural, vegetated state.

One of the most notable topographic features of AFRH-W is the hill that leads up to the Winfield Scott Statue (Building 60). The steep slope blocks views of the statue until one is upon the surrounding grove. Conversely, the statue's location on top of this slope affords the dramatic views to downtown Washington, D.C. The lakes outfall, one of the lowest points on the campus, is also an important topographic feature. Once the outfall of a natural stream into the artificial lakes, this low-lying area dried up when the golf course construction resulted in the filling in of the stream. The topography and remnants of the old outfall structure still exist on site, but not in relation to any extant hydrology. Other alterations to the property's topography are evident through historic documentation. In 1940, the topography of the current golf course changed when a hill was re-graded for the construction of an underground reservoir, and in 1961, the topography of the land between Pershing Drive and the current southern boundary of AFRH-W was altered during the transfer of excavated soil from the Veterans Administration Hospital construction site.

The steep slopes that define the ridges and plateaus of AFRH-W facilitate many dramatic views from various locations on the property. These views, both architectural and natural, are a central tenant of the property's picturesque landscape. The landscape at AFRH-W, as designed in the 1860s and 1870s, took advantage of several preexisting natural vistas from hilltops and knolls, and the placement of some of the property's original buildings was influenced by the views afforded by their location. Vistas of the United States Capitol are of particular significance to the property, and the intent to protect the view shed was recorded in the Minutes of the Board of Commissioners in the 1870s. Accordingly, the location and orientation of buildings and structures constructed during the late nineteenth and early twentieth centuries ensured the retention of this view shed. Outside the period of significance for AFRH-W, improvements have been less sensitive to the preservation of this resource. The 1954 Scott Building (Building 80) obstructs the view from the Lincoln Cottage (Building 12) and Sherman Building (Building 14) to the Capitol and interrupts the historic visual connection between the Central Grounds Character Area and the hospital complex. These views are still intact from the vicinity of the Scott Statue (Building 60), a view shed framed by designed landscape features from 1873.

Views sheds from streets and paths that wind through the campus are also important design features. A view from Pershing Drive to the hospital complex was obscured in 1954 when Ignatia Hall (Building 65) was constructed. However, a view from the hospital complex to the meadow below is still intact.

To take advantage of these view sheds and topographic features, the spatial organization of the campus' built resources and sites has retained a similar configuration throughout the property's period of significance. Historic maps show that the Military Asylum's arrangement of improved and unimproved land is consistent with layout of the clusters of farm buildings and residences that predates the establishment of the institution. The various planning phases, building campaigns, and landscape design efforts at AFRH-W during the late-nineteenth and twentieth centuries built upon the principles of this early layout.

The spatial organization of the campus can be divided into three subcategories, breaking down AFRH-W along the same general lines as the Character Areas. Building Clusters, including the Central Grounds and the Hospital Complex, are areas where structures have always dominated the immediately surrounding landscape and share a relationship both by physical orientation and general use. Tree Canopy Areas, such as those surrounding the lakes, are defined by dense tree growth that creates a barrier between the ground and the sky. Built resources may exist within these shaded areas, but the land remains primarily wooded. Open Spaces, such as the garden plot and golf course, form the largest component of AFRH-W's spatial organization and are defined by the lack of large clusters of development or vegetative growth. The term "open" does not preclude the existence of hydrologic features, individual built resources, or sparse plantings within these areas.

The only exceptions to these land patterns are the Scott Building (Building 80) and the southeastern service area, both part of the implementation of the 1953 Master Plan. Although part of a modern-day building cluster, the Scott Building is located on land that had historically been kept open specifically to preserve the views of the U.S. Capitol from the Lincoln Cottage (Building 12) and Sherman Building (Building 14), as well as the visual connection between the domiciliary area and the hospital complex. Similarly, the campus' current southeastern corner remained unimproved from AFRH-W's establishment until the development of the 1950s service area. These developments have dramatically changed aspects of AFRH-W's spatial organization.

Although the northeastern portion of AFRH-W has also seen a high level of change as a result of the 1953 Master Plan— including the demolition of the original Sheridan Building, the King

Dormitory, and the original service area and the subsequent construction of the new Sheridan Building (Building 17)— this land had historically been part of the northern building cluster. Therefore, the construction of non-historic buildings on this land has not changed the overall spatial organization of the campus. Furthermore, continuing landscaping efforts of AFRH-W have often changed various aspects of vegetation and topography, compromising the integrity of some individual landscape resources; however, the general character of these open spaces and tree canopies has been preserved by keeping built resources within two roughly defined clusters of development. Changes in land use have also compromised the integrity of individual resources, such as the conversion of the northern portion of the historic agricultural fields to the present-day golf course; however, the open character of this land has not changed since the property was purchased by AFRH-W in 1851.

Boundaries

The boundary of the Spatial Patterns Character Area is contiguous with the property boundaries of AFRH-W.

Historic Properties Outside of AFRH-W

Outside of AFRH-W, seven additional historic resources within the APE that could be affected by the proposed Master Plan have been identified: the Adams Memorial; the Rock Creek Church Yard and Cemetery; Saint Paul's Episcopal Church (Rock Creek Church); Harewood Gate Lodge and East Grounds; Petworth; Park View; and the United States Soldiers' and Airmen's Home National Cemetery. Of these, the Adams Memorial, the Rock Creek Church Yard and Cemetery, and Saint Paul's Episcopal Church are listed on the National Register of Historic Places. The Harewood Gate Lodge and East Grounds, Petworth, Park View and United States Soldiers' and Airmen's Home National Cemetery are potentially eligible for listing on the National Register.

The Catholic University of America: The Catholic University of America is located to the east of AFRH-W at 620 Michigan Avenue, N.E. in the residential community of Brookland. The campus, consisting today of 193 acres, is bounded by Monroe Avenue to the south, North Capitol Street to the west, Hawaii Avenue to the north, and John McCormick Road to the east. In April of 2004, the university purchased 49 acres of land associated with AFRH-W from AFRH. Catholic University is unique as the national university of the Roman Catholic Church and as the only higher education institution founded by the U.S. Roman Catholic bishops. The university was established in 1887 with the approval of Pope Leo VIII (1810-1903) as a graduate and research center and began to offer undergraduate education in 1904. The university's 55 major

buildings reflect the Romanesque Revival style and the influences of the mid-twentieth-century Modern Movement. The most prominent of these buildings is the Basilica of the National Shrine of the Immaculate Conception, which is the largest Roman Catholic church in the Western Hemisphere and the seventh-largest religious structure in the world. Construction of the sanctuary began in 1920, and after considerable delay, the tower was completed and the church opened in 1959.[19] The church is listed in the National Register of Historic Places and designated as a National Historic Landmark.

Adams Memorial[20]: The Adams Memorial was listed in the National Register of Historic Places on March 16, 1972 and is located within the Rock Creek Church Yard and Cemetery grounds. Completed in 1891, the monument was commissioned by noted writer and historian Henry Adams to mark the burial location of his wife, Clover Hooper Adams, following her suicide in 1885. The monument consists of an enrobed, seated bronze figure by sculptor Augustus Saint-Gaudens within an architectural framework designed by Stanford White. The figure, commonly known as "Grief," is widely acclaimed as a masterpiece of Saint-Gaudens, the foremost American sculptor of the late-19th century. The work impacted the development of abstract composition and form in 20th-century American sculpture.

Rock Creek Church Yard and Cemetery/Saint Paul's Episcopal Church: The 86-acre property known as Rock Creek Church Yard and Cemetery is roughly bounded by Gallatin Street on the north, North Capitol Street on the east, Rock Creek Church Road on the southeast, Webster Street on the south, and New Hampshire Avenue on the west. AFRH-W is located to the south of the cemetery, to the south of Webster Street where it intersects with Rock Creek Church Road and Harewood Road.

The Rock Creek Parish was formed in May 1712 to serve the Rock Creek Hundred. In September 1719, Colonel John Bradford, a prominent Maryland planter, pledged 100 acres of land to the Vestry to serve as a glebe for the parish. The glebe, the site of the present church yard, was described as having "timber for building…and necessary houses for a glebe for the use of present and future ministers…forever."21 Farmed for many years with trees felled for sale as firewood, the glebe was entitled "Generosity." Other members of the Vestry pledged 4,350 pounds of tobacco and 45 pounds of sterling for the support of the church. Construction of a

19 Historical information derived from web page of the Basilica of the National Shrine of the Immaculate Conception at www.nationalshrine.com.

20 Description taken in part from District of Columbia Inventory of Historic Sites 2004 Edition.

21 History derived from Saint Paul's Episcopal Church web site at www.rockcreekparish.org.

temporary wood-frame edifice began immediately after the establishment of the church in 1719, followed by the erection in 1721 of a brick church. By that time, the first of the parishioners was interred to the north/northwest of the church. The new church was known as Prince George's Church, and later Christ Church, Rockville. The title Rock Creek Church was not officially used until 1856. Saint Paul's Episcopal Church (Rock Creek Church) and the Adams Memorial were individually listed in the National Register of Historic Places in 1972. The Rock Creek Church Yard and Cemetery was listed in the National Register of Historic Places in 1977.

Harewood Gate Lodge and East Grounds: Harewood Gate Lodge and East Grounds is located on a 46-acre parcel recently sold by AFRH-W to Catholic University. The site is a portion of Harewood, the country estate of William Wilson Corcoran (1798-1888), Washington, D.C., financier, philanthropist, and art collector. Corcoran co-founded the Riggs Bank in 1840 with George W. Riggs. Both Riggs and Corcoran achieved tremendous financial success by the mid-19th century, affording them the luxury of expansive country estates, then outside of the limits of Washington, D.C. By 1842, Riggs had acquired the property that now forms the north portion of AFRH-W and within a year had completed Corn Rigs, the Cottage Gothic-style dwelling now known as the Lincoln Cottage (Building 12). By 1861, Corcoran had established his own country estate called Harewood on the land directly south of the Riggs tract.

Harewood was known in the 1860s for its extensive, elegantly landscaped grounds. Maps indicate that in 1861 Harewood consisted of both open and cultivated land, orchards and forest, tree-lined avenues, as well as a sizeable building cluster in the area where the Washington Hospital Center is now located. The stone Gate Lodge on Harewood Road, formerly Building 63 (Southeast Gate House) of AFRH-W, was present by 1861. When AFRH-W acquired the 190-acre Harewood tract in 1872, it provided an impetus and a model for the Olmsted-inspired picturesque landscape design that was executed at AFRH-W in the 1870s. The tract also allowed for the expansion of the subsistence farming activities at the Soldiers' Home. A dairy farming operation was centered in the area of the main building cluster at Harewood, while the lands east of this remained natural and park-like. With the increase in acreage and the incorporation of Harewood, considered one of the city's best landscaped estates, AFRH-W had evolved into one of the largest open spaces in the eastern United States.

Little change or development has occurred on this 46-acre tract since the mid-19th century. AFRH-W continued to use the tract as parkland up until its recent sale, incorporating the existing Gate Lodge into the larger network of gatehouses at the Soldiers' Home and constructing a new gate house in the early 20th century (formerly Building 62, East Gate House). Today the property is largely divorced from its larger context by the construction of North Capitol Street

and Irving Street in the 1960s and the development of the western portion for the Washington Hospital Center, Children's Hospital, and Veterans Administration Hospital. However, the survival of the Gate House, the significance of the Harewood Gate Lodge, the natural landscape, and historical associations make this property potentially eligible for individual listing in the National Register of Historic Places under Criteria A, B, and C.

Park View, Petworth, and Pleasant Plains: The land making up the neighborhoods of Park View, Petworth, and Pleasant Plains was originally part of several large country estates. Petworth, for example, includes the land from two separate estates: the 204-acre estate of Colonel John Tayloe known as Petworth and the 183-acre Marshall Brown estate, which eventually became the property of the Tayloe family. The subdivisions of Pleasant Plains and Park View, along with the nearby subdivisions of Columbia Heights and Mount Pleasant, were developed from the eighteenth-century estate of Anthony Holmead. Holmead occupied the estate, which he named Pleasant Plains, from 1750 to 1802. In the latter part of the nineteenth century, development groups specifically engaged in the acquisition and subdivision of sites for the creation of new suburbs purchased former country estates such as Tayloe's Petworth and Holmead's Pleasant Plains. The planned suburbs were expected to profit from their location along Seventh Street Extended (now Georgia Avenue), where the streetcar line was to be extended.

Park View: Park View is an urban neighborhood bordered by Park Place and AFRH-W to the east, Harvard Street to the south, Sherman Avenue to the west, and New Hampshire Avenue and Rock Creek Church Road to the north. The name Park View is understood to come from the neighborhood's view eastward into AFRH-W. The greatest period of development in Park View began in 1906 after the subdivision of numerous lots, although portions of the neighborhood had been platted as early as the late nineteenth century.[22] Park View Elementary School was established in 1916 and continues to provide elementary education for residents of the neighborhood. Today, the planned residential subdivision of Park View has two- and three-story row houses designed in Victorian-era and early-twentieth-century architectural styles such as the Queen Anne, Italianate, Romanesque Revival, and Colonial Revival. Park View was identified in 1991 in the District of Columbia Comprehensive Plan for Historic Preservation's "Historic

22 "Increase in Volume of Surveyor's Work," The Washington Post, 31 August 1906, 10.

Context Outline" as a platted early-twentieth-century (ca. 1900-1915) "residential neighborhood outside Georgetown and the L'Enfant city."[23]

Petworth[24]**:** is a residential neighborhood bounded by Georgia Avenue to the west, North Capitol Street to the east, Rock Creek Church Road to the south, and Kennedy Street N.W. to the north. It is located to the northwest of AFRH-W. The official subdivision plat was filed on January 16, 1889 by the Petworth Syndicate, which included such prominent local residents as Brainard H. Warner, Myron M. Parker, A.A. Thomas, and E.A. Paul. It was estimated in the 1890s that $200,000 needed to be spent to prepare the infrastructure for the entire 387-acre neighborhood for resale to prospective home owners. The streets of Petworth were intentionally laid as an extension of L'Enfant's plan for the city of Washington, arranging a grid plan transversed by diagonal avenues with circles at the major intersections. Today, the planned urban subdivision of Petworth, one of the largest in the District of Columbia, is known primarily for its two- and three-story row houses illustrating the eclectic architectural styles fashionable in the early-twentieth century. Petworth was recognized in 1991 in the District of Columbia Comprehensive Plan for Historic Preservation's "Historic Context Outline" as a platted interwar (ca. 1915-1930) "residential neighborhood outside Georgetown and the L'Enfant city."[25]

Pleasant Plains: Pleasant Plains is bordered by Second Street, Park Place, and the McMillan Reservoir to the east; Florida Avenue and Barry Place to the south; Sherman Avenue to the west; and Harvard Street to the north. It is flanked on the eastern side by the Washington Veteran Affairs Medical Center and Washington Hospital Center, and by the Columbia Heights and Park View neighborhoods on the west and north sides. AFRH-W is located to the northeast.

Howard University occupies the largest portion of the community. The residential enclave that has developed around the college dates from the late nineteenth century through to the second quarter of the twentieth century. The attached rows of two- and three-story dwellings reflect the architectural styles popular during this period. The highly traveled commercial corridor of Georgia Avenue, lined with buildings dating from circa 1869 to the late twentieth century, bisects the neighborhood. By the second quarter of the twentieth century the area that once made up Anthony Holmead's country estate was renamed Pleasant Plains; the name, however, has

23Historic Preservation Division, "Historic Contexts for the District of Columbia: An Outline of Thematic Units for the Study of Historic Resources in the District of Columbia," September 1991, 79.

24Historical information derived from neighborhood web page at www.petworthdc.net.

25Historic Preservation Division, "Historic Contexts for the District of Columbia: An Outline of Thematic Units for the Study of Historic Resources in the District of Columbia," September 1991, 79.

come to refer more to a general area in northwest Washington, D.C., rather than a defined neighborhood.26

The United States Soldiers' and Airmen's Home National Cemetery: The U.S. Soldiers' and Airmen's Home National Cemetery is situated to the northeast of AFRH-W. Located at 21 Harewood Road, N.W., the triangular-shaped cemetery is bounded by North Capitol Street to the east, Harewood Road to the south, and Rock Creek Church Road to the west. At the time of its establishment in 1862 when the first interments were made, the cemetery was located within AFRH-W. The Board of Commissioners transferred ownership of the fifteen-acre site to the War Department (now Department of the Army) in April 1883.27 The first portion of the United States Soldiers' and Airmen's Home National Cemetery to be laid out for burials was the southeast corner at the intersection of Harewood Road and North Capitol Street. The northwestern section of the cemetery remained largely wooded up to the 1970s.28

3.4 Transportation

This section describes the existing transportation facilities and existing traffic conditions in the vicinity of AFRH-W.

3.4.1 Principal Roadways

AFRH-W is surrounded by North Capitol Street to the east, Irving Street to the south, Park Place and Rock Creek Church Road to the west and Harewood Road to the north. The main roadways in the vicinity of AFRH-W include:

- North Capitol Street. In the vicinity of the site, North Capitol Street is a six-lane roadway which runs in a north-south direction. It runs from Louisiana Avenue in the south and ends at New Hampshire Avenue in the north. Its intersections with Harewood Road and Michigan Avenue are signal controlled. Left turns from North Capitol Street are prohibited at the Michigan Avenue intersection. There are sidewalks on North Capitol Street north and south of AFRH-W; however, there are no sidewalks on the portion of the road that parallels the site. The speed limit on North Capitol Street is 35 miles per hour (mph). In 2001, between 30,000 and 37,000 vehicles per day (VPD) traveled along this roadway.

26Baist Real Estate Atlas of Washington, D.C. (Washington, D.C.: G.W. Baist, 1919 and 1924).

27U.S. Department of War, Annual Report of the War Department for the fiscal year ended June 30, 1884 (Washington, D.C.: Government Printing Office, 1884), 686.

28The Department of the Army presently owns the cemetery.

- Irving Street. This is an east-west roadway that runs from Michigan Avenue in the east beyond 16th Street in the west, intersecting with the Harvard Street-Columbia Road one-way street system along the way. Irving Street also intersects North Capitol Street via a grade-separated full cloverleaf interchange. Irving Street, Michigan Avenue, Harvard Street and Columbia Road intersect each other via ramps, which in some instances are grade separated and/or yield controlled. Harvard Street, which runs in an eastbound direction, has direct access to eastbound Irving Street via a grade-separated interchange. Access from westbound Irving Street to Columbia Road, which runs westbound, must be made indirectly via Kenyon Street to the north or Hobart Place to the south, both of which also run one-way westbound near the project area. (Note that Hobart Place in this vicinity is misidentified on some maps as either Columbia Road or Irving Street). The intersection of eastbound Irving Street/Michigan Avenue is signalized. In most of the sections near AFRH-W, Irving Street has a three-lane cross-section where the third lane serves as shared right/left turns where it intersects other roadways. There are sidewalks on the south side of Irving Street in the vicinity of AFRH-W. The speed limit on Irving Street is 25 mph.

- Rock Creek Church Road. This is a two-lane roadway aligned in a north-south direction between Park Place and North Capitol Street. Its intersections with Harewood Road and Upshur Street are signalized, and its intersection with Randolph Road/Illinois Avenue is stop sign controlled. This roadway carries approximately 8,000 VPD north of Upshur Street and approximately 4,000 VPD south of it. There are sidewalks on both sides of Rock Creek Church Road in the vicinity of AFRH-W. Parking is permitted south of Harewood Road. The speed limit on Rock Creek Church Road is 25 mph.

- Park Place. This is a three lane, one-way, southbound roadway extending between Rock Creek Church Road and Irving Street. Land along the west side is developed with single family homes. The outside lane of this roadway is signed for parking to serve local residents and therefore operates as a two lane facility. The intersections with Rock Creek Church Road, Kenyon Street, and Irving Street are signalized. The speed limit on Park Place is 25 mph.

- Harewood Road, NW. This is a two-lane roadway aligned in a general east-west direction extending from Rock Creek Church Road on the west to North Capitol Street on the east. The road is one-way eastbound between Rock Creek Church Road and North Capitol Street. Fort Drive, NE forms the eastern leg of the North Capitol Street / Harewood Road, NW intersection, and extends approximately one-third of a mile east of

North Capitol Street to an intersection with Taylor Street, NE and Harewood Road, NE. The intersection with North Capitol Street is split, with one signal controlling access from eastbound Harewood Road, and another signal about 300 feet to the north controlling access from a "jug-handle" roadway built to accommodate the westbound Fort Drive approach. A majority of the traffic along Harewood Road appears to be cut through traffic from Taylor Street, which provides access to Catholic University of America. The intersections with North Capitol Street, Rock Creek Church Road, and Michigan Avenue are signalized. There are sidewalks on both sides of Harewood Road in the vicinity of AFRH-W. The speed limit on Harewood Road is 25 mph.

- Columbia Road/Harvard Street. This is a one-way roadway couplet which runs in an east-west direction from 16th Street to Michigan Avenue. Its intersections with Michigan Avenue are either via grade separated or yield controlled ramps. These two roadways are a major part of the east-west roadway network in the vicinity of the project site. There are sidewalks on both sides of Columbia Road and Harvard Street in the vicinity of AFRH-W. The speed limit on Columbia Road and Harvard Street is 25 mph.

- Michigan Avenue. This is an east-west, three-lane, roadway originating at the interchange with Columbia Road, taking a path along the south boundary of the Washington Hospital Center and continues northeast past South Dakota Avenue to the border with Maryland where it becomes Queens Chapel Road. This roadway is one of several east-west routes in the vicinity of the site. The intersections with North Capitol Street and Harewood Road are signal controlled and its intersection with Columbia Road – Harvard Street is grade separated. There are sidewalks on both sides of Michigan Avenue in the vicinity of AFRH-W. The speed limit on Michigan Avenue is 35 mph.

- Georgia Avenue. This is a major north-south roadway which provides a connection from downtown DC to I-495. Near the vicinity of AFRH-W the street changes names to Seventh Street. It intersects both Columbia road and Harvard Street at signalized intersections. The speed limit on Georgia Avenue is 35 mph.

3.4.2 Traffic Operations Analysis

Traffic count data was collected at the following locations in November 2006 (see Figure 3-11a):

- North Capitol Street/Harewood Road, NW

- North Capitol Street/Scale Gate Road, NW

- North Capitol Street/Michigan Avenue, NW
- Irving Street, NW/1st Street, NW
- Irving Street, NW/Park Place, NW
- Irving Street, NW/Hobart Pl, NW
- Park Place, NW/Kenyon Street, NW
- Rock Creek Church Road, NW at Harewood Rd., NW
- Rock Creek Church Road, NW at Illinois Ave., NW/Randolph St., NW
- Rock Creek Church Road, NW at Upshur St., NW

The existing AM and PM peak hour traffic volumes at these intersections are presented in Figure 3-11b. The AM peak hour is defined as one hour between 7 am and 9 am and the PM peak hour is defined as one hour between 4 pm and 6 pm. Traffic counts were not collected at the Irving Street/North Capitol Street interchange. According to DDOT, this interchange is underutilized and operates at an acceptable level of service (DDOT, 2005)

Using these volumes and existing lane geometries, intersection capacity analysis was performed for both the AM and PM peak hours. Analysis was performed using Synchro and Highway Capacity Manual (HCM) (Transportation Research Board, 2000) methodology which outputs a Level of Service (LOS). LOS is described in the HCM as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers." The HCM defines six levels of service ranging from A to F, with A representing the optimal operating conditions with minimal delays and F representing congestion. The District of Columbia Department of Transportation (DDOT) considers LOS E to be an acceptable limit.

Capacity analyses were carried out for both the AM and PM peak at the study area intersections. These LOS are presented with the existing traffic volumes on Figure 3-11b-c. Table 3-4 provides the LOS results and the accompanying delays for each of the intersections. All the study area intersections operate at LOS E or better during the peak hours. Note that no delay or level of service is reported for the North Capitol Street/Scale Gate Road intersection because the gate to the site adjacent to this interchange is currently closed and virtually no traffic volume was recorded on the ramps at this interchange.

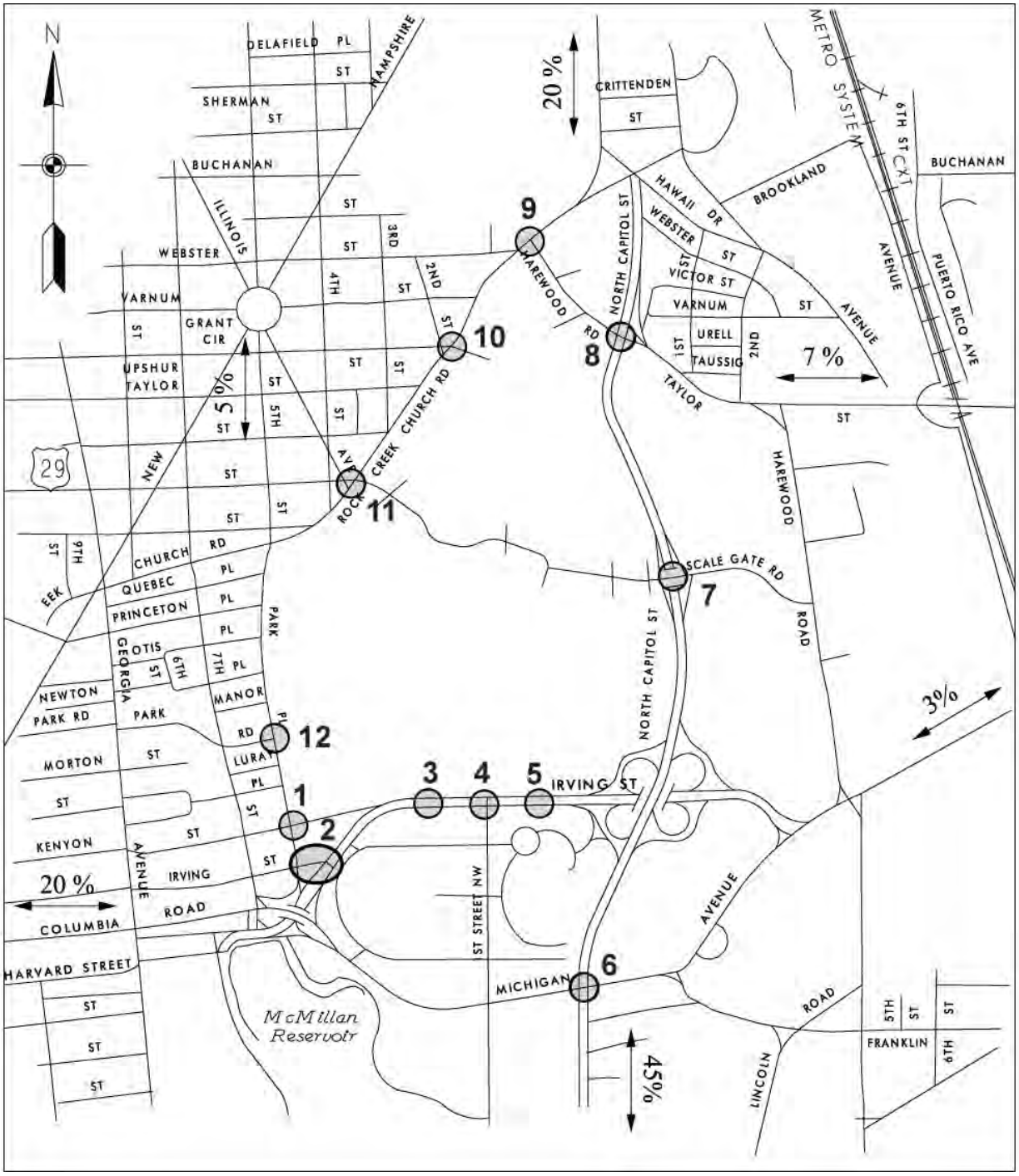


Figure 3-11a: Traffic Study Intersections

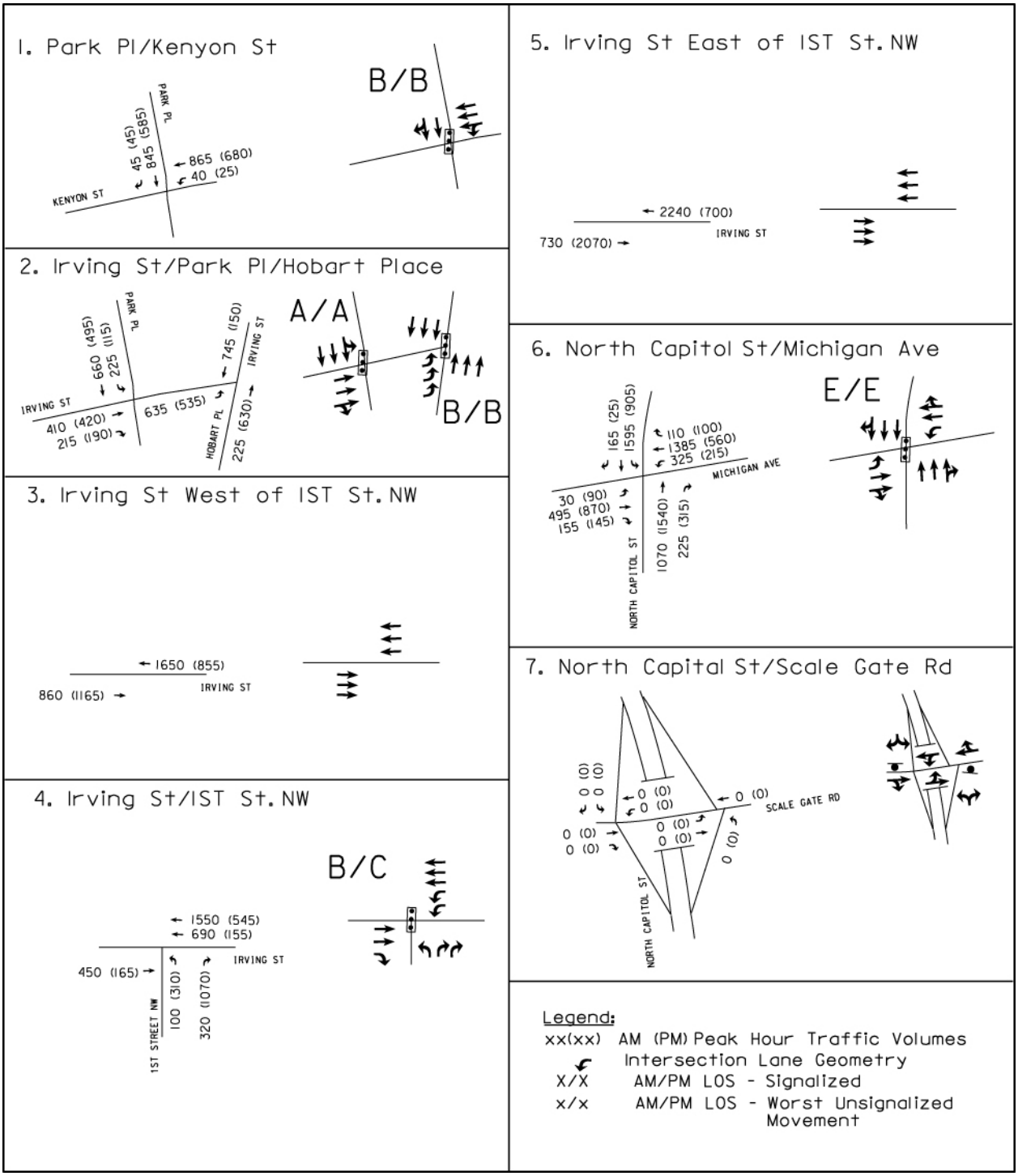


Figure 3-11b: Traffic Study Intersections (continued)

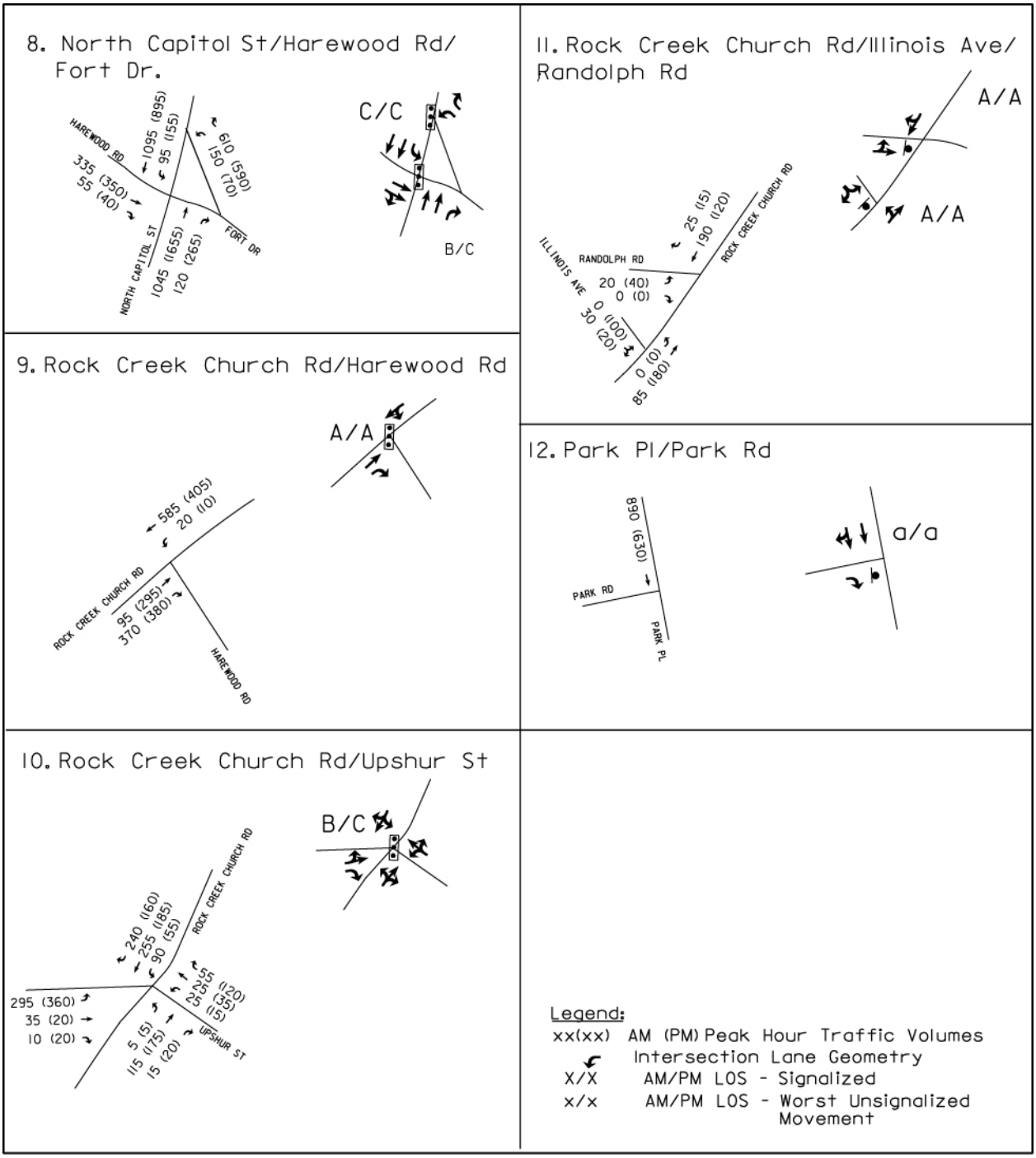


Figure 3-11c: Peak Hour Traffic Volumes, Lane Geometry, and LOS

Table 3-4: Existing Levels of Service

Intersection	AM (sec delay)	PM (sec delay)
Park Place/Kenyon Street	B (18.4)	B (16.8)
Park Place/Irving Street	A (7.7)	A (8.5)
Irving Street/Hobart Place	B (14.7)	B (14.0)
North Capitol Street/Scale Gate Road	-	-
North Capitol Street/Harewood Road	B (15.1)	C (23.5)
North Capitol Street/Fort Drive	C (25.9)	C (29.1)
North Capitol Street/Michigan Avenue	E (55.8)	E (55.9)
Irving Street/1st Street, N.W.	B (13.9)	C (29.7)
Rock Creek Church/Harewood Road	A (0.5)	A (0.3)
Rock Creek Church/Upshur Street	B (18.5)	C (23.8)
Rock Creek Church/Illinois Avenue/Randolph Road	a (0.9) *	a (1.2) *

* Lower-case letters indicate level of service for unsignalized intersection movement

No counts were taken at the intersection of Park Place and Park Road, and consequently no capacity analysis was undertaken at this intersection. However, the volumes at this intersection, assumed to be the same as those arriving downstream at the Park Place/Kenyon

Street intersections and traffic volumes are shown in Figure 3-11b-c and Table 3-4 above for reference in estimating the level of service at this location later in the analysis.

3.4.3 Transit Facilities

Many forms of transit are available in the Washington, DC metropolitan region. The Washington Metropolitan Area Transit Authority (WMATA) operates the two intra-city transit systems, Metrorail and Metrobus. Intercity transit includes MARC (the Maryland Transit

Authority's commuter rail system), VRE (Virginia Railway Express), and Amtrak. Metrobus and Metrorail routes and schedules were obtained from WMATA. Metrobus stops were located during field visits.

Five Metrobus lines and three Metrorail stations serve the area surrounding AFRH-W (see Figure 3-12). Metrobus lines H8 and 60 operate on Rock Creek Church Road and stop at the entrance of AFRH-W. All routes in the vicinity of AFRH-W are shown in Table 3-5

Table 3-5: Bus Routes in the Vicinity of AFRH-W

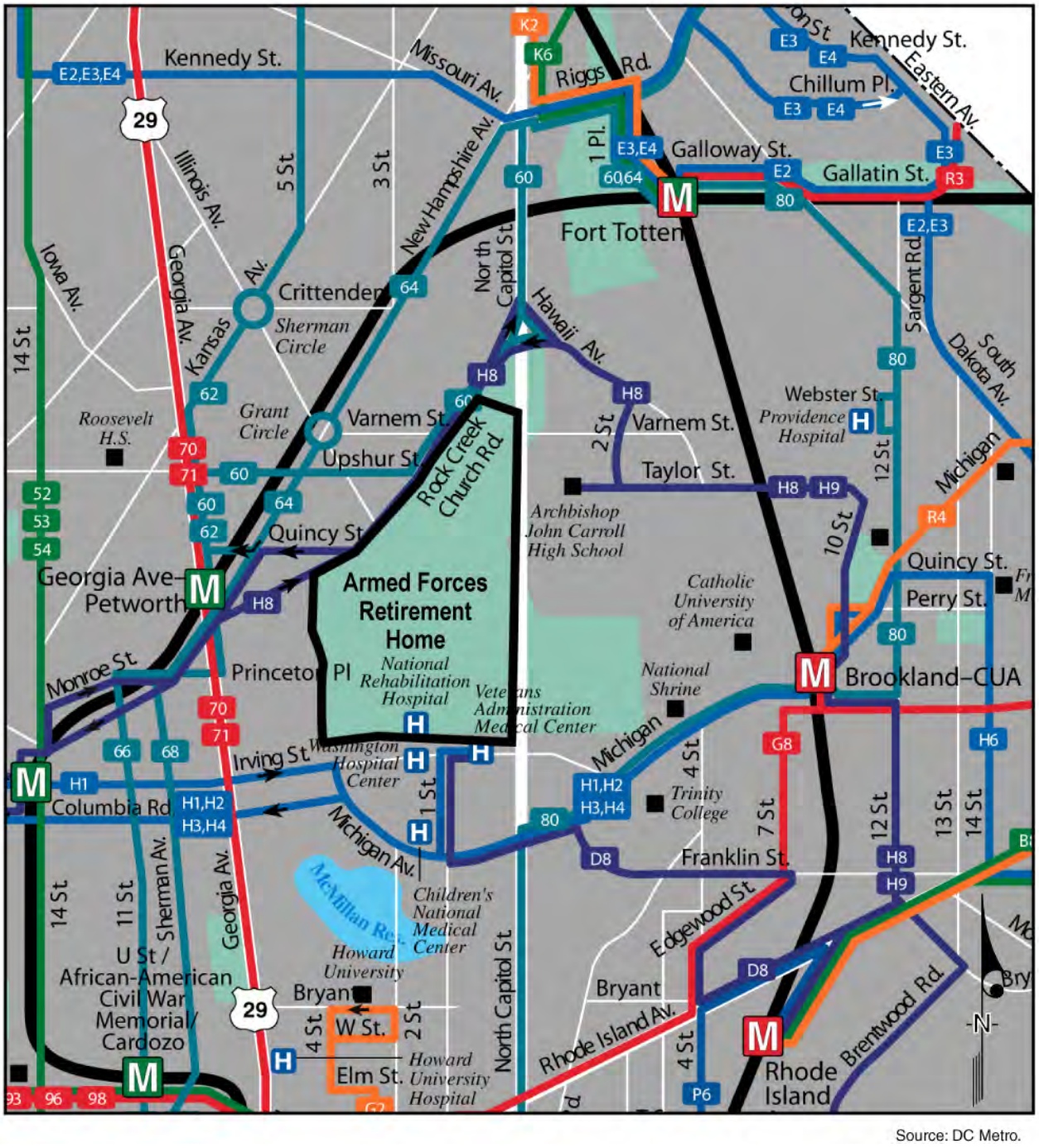
Route Number	Route Name
H8	Park Road-Brookland Line
60/64	Fort Totten-Petworth Line
H1	Brookland – CUA / Potomac Park
H2/H3/H4	Crosstown Line
70/71	Brightwood-Petworth, Georgia Ave-7th Street Line

Source: Washington Metropolitan Area Transit Authority, 2007

The Georgia Avenue - Petworth Metrorail Station, which serves the Green Line, is located eight blocks or approximately ¾-mile southwest of AFRH-W on Georgia Avenue. The Brookland Metrorail Station, served by the Red Line, is located east of the site, a distance of approximately 2 miles. The Fort Totten Metro Station, serving both the Red and Green Lines, is located approximately 3 miles northeast of the site (see Figure 3-12).

Train service is available into the city from the Maryland Commuter Rail (MARC), VRE, and Amtrak. The Maryland Department of Transportation operates the Maryland Commuter Rail (MARC) inter-city service into Union Station. Three separate lines provide weekday-only service to Union Station:

- The Brunswick Line serves western Maryland through Silver Spring, Rockville, Harper's Ferry, and continues to Martinsburg, West Virginia. At the Point of Rocks station, shuttle bus service is available to Frederick, Maryland. Nine scheduled morning arrivals (at 15- to 25-minute intervals), one scheduled mid-day departure, and nine scheduled afternoon/early evening departures (at 15- to 45-minute intervals) serve Union Station.



Source: WMATA, 2007

Figure 3-12: Metrobus and Metrorail Service in the Vicinity of AFRH-W

- The Camden Line serves downtown Baltimore through College Park, Laurel, and Jessup. There are six scheduled morning arrivals at Union Station (at 22- to 59-minute intervals), with three scheduled morning departures to Baltimore (at 25- to 58-minute intervals). There are two scheduled mid-day departures to Baltimore, and in the afternoon/early evening, there are six scheduled departures (at 26- to 55-minute intervals) and three scheduled arrivals (at 47- to 107-minute intervals).

- The Penn Line serves northeastern Maryland through Bowie, Baltimore-Washington Airport, Penn Station in Baltimore, Aberdeen, and terminates in Perryville. In the peak direction, there are 14 scheduled morning arrivals at Union Station (at 5- to 53-minute intervals) and 16 scheduled afternoon/early evening departures (at 9- to 55-minute intervals). In the off-peak direction, there are 10 scheduled morning departures for Baltimore (at 9- to 60-minute intervals) and 13 scheduled afternoon arrivals from Baltimore (at 22- to 66 minute intervals).

Virginia Railway Express operates two, weekday-only, intercity lines to Union Station. In addition, VRE tickets are honored on Amtrak weekday trains.

- The Manassas Line serves Northern Virginia through Crystal City, Alexandria, and Fairfax. There are six scheduled VRE and one Amtrak morning arrivals (at 25- to 58-minute intervals) and six scheduled afternoon/early evening and one Amtrak departures (at 20- to 40-minute intervals).

- The Fredericksburg Line serves Fredericksburg through Crystal City, Alexandria, and Woodbridge. There are six scheduled VRC two Amtrak morning arrivals (at 10- to 48-minute intervals) and six scheduled afternoon/early evening and two Amtrak departures (at 10- to 40-minute intervals).

3.5 Air Quality

New development can affect air quality in three ways: 1) through airborne dust generated by the construction process; 2) by introducing new stationary sources of pollutants, such as heating plants and boilers for new buildings; and 3) through increasing vehicular traffic to the site, which raises vehicle emission levels near the site, and possibly in the region.

3.5.1 National Ambient Air Quality Standards

The EPA, under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants,

referred to as criteria pollutants (40 CFR 50). These criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2).

3.5.2 Vehicular Pollutants

Primary automobile-related air pollutants are CO, precursors of O_3 (i.e., nitrogen oxides [NO_x], and volatile organic compounds [VOCs]). Lead emissions from vehicle operation have been virtually eliminated as a result of regulations and legislation prohibiting the manufacture, sale, or introduction into commerce after 1992 of any engine requiring leaded gasoline. Potential emissions of particulates and SO_2 from indirect (mobile) sources such as automobiles are generally insignificant in comparison with direct (non-mobile) emission sources. Therefore, only vehicular emissions of CO, NO_x, and VOCs are considered in the study.

3.5.3 National Ambient Air Quality Standard Attainment Status

Areas that are below the NAAQS for a criteria pollutant are designated as being in "attainment." Areas where a criteria pollutant level exceeds the NAAQS are designated as being in "nonattainment." O_3 nonattainment areas are categorized based on the severity of their pollution problem: marginal, moderate, serious, severe, or extreme, and CO nonattainment areas are categorized as moderate or serious. AFRH-W is located in the District of Columbia, an area with the following current designations:

- Moderate nonattainment for O_3 for the 1-hour standard
- Moderate nonattainment for O_3 for the 8-hour standard
- Nonattainment for PM_{10}
- Attainment for all other criteria pollutants

3.5.4 Background Concentration

Background CO concentrations were obtained from the District of Columbia Department of Health (DCDOH) for the District of Columbia's monitoring station at the Verizon Telephone Building on 21st Street, NW. That monitoring site was chosen for this analysis because it was the closest monitoring station to the Armed Force Retirement Home. In accordance with the District of Columbia's *Guidance for the Analysis of Air Quality Studies Performed as a result of the Environmental Impact Screening Form Process,* the second highest 1-hour and 8-hour CO concentrations within the last three years were used as the background concentrations. Table 3-6 presents the background CO concentrations used for this study. In the air quality analysis, the

existing background concentration is added to the predicted change in CO concentration associated with the Build Alternatives.

Table 3-6: Background CO Concentrations (2006)

1-Hour Concentration (ppm)	8-Hour Concentration (ppm)
3.2	2.3

3.6 Noise

The extent to which individuals are affected by noise is controlled by several factors, including:

- The duration and frequency of sound,
- The distance between the sound source and the receptor,
- The intervening natural or man-made barriers or structures, and
- The ambient environment

The Leq descriptor indicates constant sound level that, in a given time period (e.g., one-hour Leq [Leq(1)] or 24-hour Leq [Leq(24)]), would convey the same sound energy as the actual fluctuating sound. The Federal Highway Administration (FHWA) and each State's department of transportation use the Leq(1) descriptor to estimate the degree of nuisance or annoyance arising from changes in traffic noise. Because the principal noise-related concern raised by the proposed action is that of traffic-induced noise, the Leq(1) descriptor is used in this analysis.

The unit of measure for Leq is the "A-weighted" decibel (dBA). The dBA scale de-emphasizes the very low and the very high frequencies and emphasizes the middle frequencies, thereby closely approximating the frequency response of the human ear. Common noise sources and their sound levels are described in Table 3-7.

Table 3-7: Common Noise Sources and Their Sound Levels

Source	Sound Level (dBA)
Near large jet at takeoff	140
Air-raid siren	130
Threshold of pain	120
Thunder or sonic boom	110
Garbage or trailer truck at roadside	100
Power lawn mower at 5 feet	90
Alarm clock or vacuum cleaner	80
Freeway traffic at 50 feet	70
Conversational speech	60
Average residence	50
Bedroom	40
Soft whisper at 15 feet	30
Rustle of leaves	20
Breathing	10
Threshold of hearing	0

Source: Adapted from U.S. National Bureau of Standards Handbook 119, 1976.

Human ability to perceive change in noise levels varies widely from person to person, as do responses to perceived changes. Generally, a three dBA change in noise level would be barely perceptible to most listeners, whereas a ten dBA change is normally perceived as doubling (or halving) of noise levels and is considered a substantial change. These thresholds (summarized in Table 3-8) permit direct estimation of an individual's probable perception of changes in noise levels.

Table 3-8: Perception of Changes in Noise Levels

Change in dBA	Perception
0	Reference
3	Barely perceptible change
5	Readily perceptible change
10	Twice or half as loud
20	Four times or ¼ as loud
40	Eight times or 1/8 as loud

Source: Federal Highway Administration, June 1995 (Highway Traffic Noise Analysis and Abatement Policy and Guidance)

Because the dBA noise metric describes steady noise levels, and very few noises are in fact constant, a method to describe noise varying over a period of time is needed. One such method is to describe fluctuating noise over a period as if it were steady and unchanging. For this purpose, a descriptor called the equivalent sound level, Leq, is computed.

FHWA has established noise abatement criteria (NAC) that define limits beyond which noise abatement measures must be considered. Since the proposed action is not a FHWA project, these standards are not directly applicable. However, they provide a convenient benchmark to assess the level at which noise becomes a marked source of annoyance. Thresholds vary depending on the type of land use in the area considered are summarized in Table 3-9. Land use Category B, which represents moderately sensitive land uses, including residents, churches, and hospitals, best characterizes land uses near AFRH-W. The NAC for Category B land uses is a Leq(1) of 67 dBA.

Table 3-9: Noise Abatement Thresholds

Activity Category	Description of Activity Category	Leq(1)
A	Land for which serenity and quiet area of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose	57 (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (exterior)
C	Developed land, properties, or activities not included in Categories A or B above	72 (exterior)
D	Undeveloped lands.	N/A
E	Residences, motels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 (interior)
Note: The Leq(1) designations represent hourly A-weighted sound levels expressed in dBA.		

Source: FHWA, June 1995

Eight sites were identified for analysis of the existing and future noise environment and are shown on Figure 3-13. These sites represent both existing noise-sensitive areas and areas that may become noise-sensitive following site development. Receptor analysis sites are distributed throughout AFRH-W property to represent as many noise environments as possible and to assess the levels of existing and potential noise within the community. The following describes each receptor site and its acoustic characteristics.

Receptor 1: Receptor 1 represents a currently undeveloped area on AFRH-W adjacent to Irving Street at the former Irving Street entrance to AFRH-W. The primary source of noise in this area is from roadway traffic on Irving Street. This area is proposed for medical use, and certain medical uses, such as hospitals, qualify as noise-sensitive uses.

Receptor 2: Receptor 2 is a location on AFRH-W with a similar distance to Park Place as the front yards and porches of the residences on Park Place. The primary source of noise in this area is roadway traffic on Park Place.

Receptor 3: Receptor 3 is a location on AFRH-W with a similar distance to Rock Creek Church Road as the front yards and porches of the residences on Rock Creek Church Road. The primary source of noise in this area is from roadway traffic on Rock Creek Church Road.

Receptor 4: Receptor 4 represents an outdoor use area on AFRH-W - the patio outside the Scott Building (Building 80). This patio is in the interior area of the property and is removed from most roadway noise sources.

Receptor 5: Receptor 5 represents the bandstand, an outdoor use area in the northern portion of AFRH-W.

Receptor 6: Receptor 6 represents a currently undeveloped area on AFRH-W adjacent to the Irving Street/North Capitol Street interchange. Noise–sensitive use (residential) is proposed under one of the Master Plan Alternatives (Alternative 4) in this location.

Receptor 7: Receptor 7 represents the Rose Chapel on AFRH-W. Noise-sensitive use (residential) is proposed in this area under all the Master Plan Alternatives.

Receptor 8: Receptor 8 is a location on AFRH property with a similar distance to Rock Creek Church Road as the front yards and porches of the residences on Rock Creek Church Road. Noise-sensitive use (residential) is proposed in this area under all the Master Plan Alternatives.

Receptor 9: Receptor 9 is a location on AFRH property near the intersection of Irving Street and Park Place. Noise sensitive use (residential) is proposed under several of the Master Plan Alternatives.

An additional receptor was considered for the cemetery at Harewood and North Capital Street. However, the on-going construction in this area would have resulted in excessively high noise readings, rendering the noise models invalid.

Field Measurements. Noise monitoring was conducted in accordance with the procedures outlined in FHWA-PD-96-046, Measurement of Highway-Related Noise (May 1996). One 24-hour noise measurement was taken at the Receptor 6 location from 6:00 p.m on February 1st to 6:00 p.m. on February 2nd, 2005 and two 24-hour noise measurements were taken at Receptors 7 and 8 from 5:00 p.m. on February 2nd to 5:00 p.m. on February 3rd, 2005 to determine noise fluctuations in the study area over a 24-hour period. Five 20-minute measurements were taken at receptor locations 1 to 5. Short term measurements were taken from 10:40-11:00 a.m. and from 12:00 p.m. to 12:20 p.m. Temperatures during the measurements ranged from 35 to 40 degrees with winds of 5 to 7 mph. Weather was cloudy but dry until a light mix of snow and rain started approximately two to three hours after the short term measurements were complete. The last three hours of the 24-hour measurements were affected by wet pavement on study area roads. Because only short-term measurements were used for model validation, the precipitation did not affect the noise study results. Traffic on each roadway surrounding the study area was counted and traffic speeds were measured during each measurement period.

Noise Levels Results. Existing noise level results are presented below in Table 3-10. The only area slightly above NAC thresholds is the Park Place Row Homes. The remaining receptors are within the acceptable range for Category B locations.

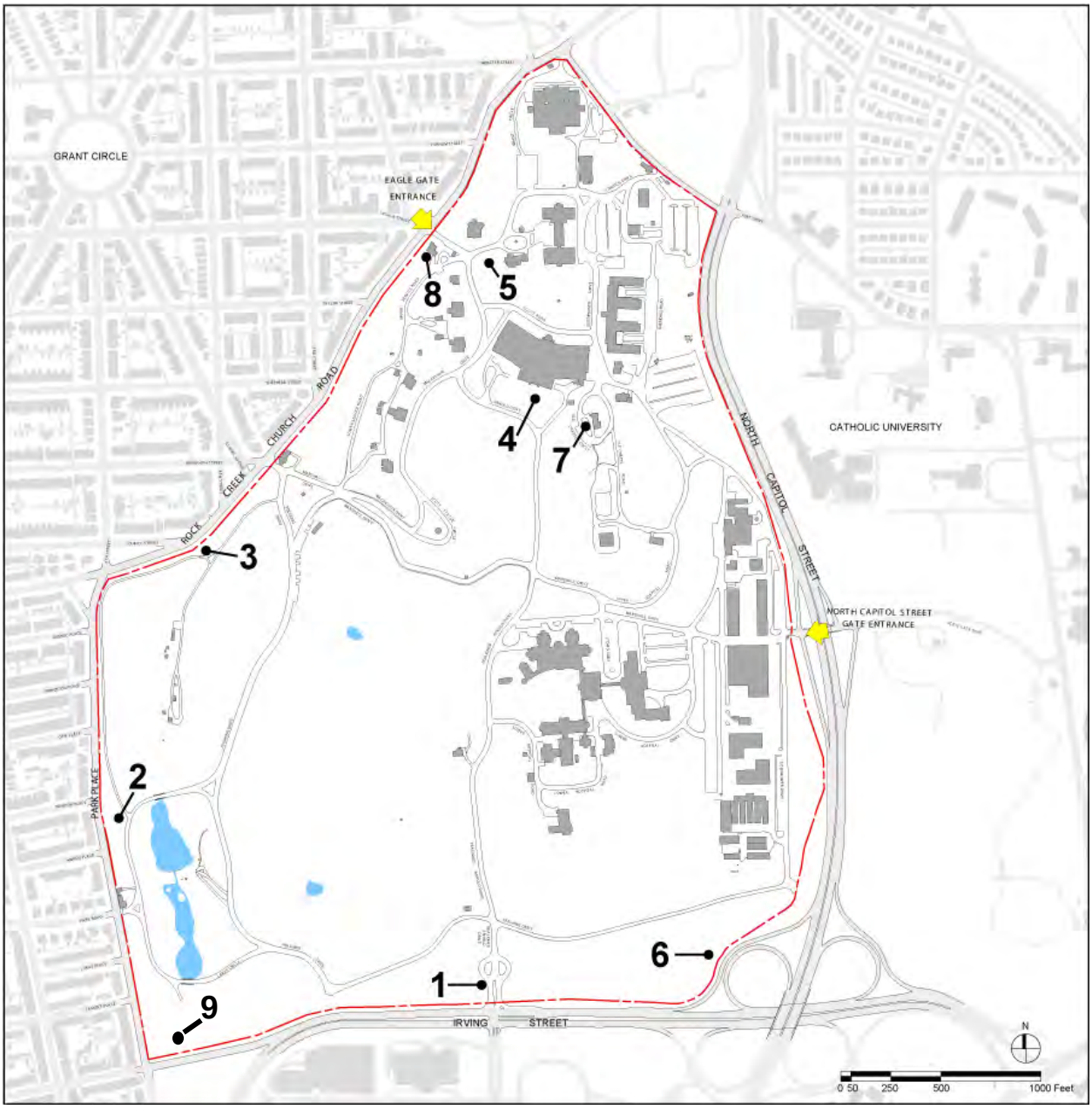


Figure 3-13: Noise Receptors

Table 3-10: Noise Level Results

Receptor	Location	Existing Noise Levels dBA
1	Irving Street Entrance	67
2	Park Place Row Homes	68
3	Rock Creek Church Road Row Homes	65
4	Scott Building Patio	51
5	Bandstand	61
6	Irving Street/North Capitol Street Interchange	59
7	Rose Chapel	51
8	Rock Creek Church Road	62

Validation. The traffic count, vehicle mix, and speed data collected during the measurements were used as input into the noise model. The model results were compared with the field noise measurements to determine whether the noise model developed for AFRH-W realistically characterized the acoustic environment of the study area. In general, model results within 3 dBA of field measurements indicate that the model is a reasonable representation of existing conditions. Differences greater than 3 dBA indicate that the model inputs require re-evaluation, potential adjustment, or additional field noise measurements.

Because traffic is the largest noise generator in the vicinity of AFRH-W, FHWA's Traffic Noise Model (TNM) Version 2.5 was used to validate measured noise levels. The FHWA model uses traffic volume data, average speeds, and vehicle type mix to generate noise level predictions. The FHWA Traffic Noise Model does not account for general community noise. Measured noise levels at receptor sites adjacent to the roadways surrounding the study area matched TNM-predicted noise levels within the 3 dBA guidelines. However, the model under-predicted noise levels for receptor sites on the interior of AFRH property. The model under prediction is attributable to these sites' distance from roadways, building mechanical systems contribution to ambient noise and to activity at the guard gate (human voices and vehicle movement not accounted for in the model). Therefore, these sites were not used for validation, but were included in the assessment to evaluate the future impact of change in traffic noise levels.

3.7 Utilities

3.7.1 Water Service

DC Water and Sewer Authority (DCWASA) provides retail water service to residential and commercial customers in the District of Columbia. Water is supplied to the District of Columbia from the Potomac River through the Dalecarlia and McMillan Reservoirs where filtration and treatment occur. The USACE operates the reservoirs. Pump stations at the reservoirs, and elsewhere in the system, deliver water through mains to the city and certain surrounding areas. On AFRH-W, there is also a 15 million-gallon underground reservoir, in the golf course area. AFRH-W entered into an agreement with the District of Columbia Department of Public Works in 1938 allowing the District to maintain the reservoir on the property in exchange for water and sewer services without charge. A 48-inch water line runs from the reservoir to Irving Street and connects to the District's system. Developed portions of AFRH-W are served by a 12-inch loop that ties into a 48-inch water main on the site's western perimeter along Park Place and a 16-inch line near Upshur Street (see Figure 3-14). .

3.7.2 Sanitary Sewer

Sanitary sewer service in the District of Columbia is provided by the DCWASA which is responsible for the maintenance of lines and the operation of the Blue Plains Wastewater Treatment Plant. Sanitary sewer lines in DC convey sewage to the Blue Plains Plant for treatment prior to discharge into the Potomac River. Blue Plains has an annual average day capacity of 370 million gallons per day and a peak wet weather capacity of over 1 billion gallons per day. Approximately 1/3 of the District of Columbia, including AFRH-W, is served by combined storm and sanitary sewer facilities. This system collects sewage flows from buildings and stormwater from surface runoff and conveys those flows to the Blue Plains Wastewater Treatment Facility for treatment. If the capacity of the sanitary sewer/stormwater system is exceeded, the excess flow spills into the Potomac River and its tributaries. This discharge is called Combined Sewer Overflow (CSO). A sewer separation program has been in place since 1930, requiring more recently developed areas to have separate dedicated piping systems for both storm drainage and sewage. These more recent facilities serve to reduce the variability of flows required to be treated at Blue Plains by directing only sewage to the facility for treatment, while stormwater is conveyed directly to outlets into the Potomac River and its tributaries.

Stormwater on AFRH-W is collected in various paved flumes and ponds on-site which discharge into combined sewer and stormwater lines on AFRH-W. These lines connect to District sewer lines at various points along the property's perimeter. Sewer lines from buildings on the western

side of the property connect to District sewer lines on Rock Creek Church Road; sewer lines from buildings in the northeastern portion of the property connect to District sewer lines on Harewood Road; and sewer lines from buildings in the southern portion of the property connect to District sewer lines on Irving Street. A storm drain that ranges in size from 48 to 54 inches runs along the east side of North Capital Street.

The District of Columbia Municipal Regulation (DCMR), Title 21, Water and Sanitation, Sections 526 through 535 regulate stormwater runoff from new construction. These regulations set controls on the quantity of runoff and quality of runoff for specified storm events. The regulations are enforced by the District of Columbia Department of Environment, Watershed Protection Division (WPD). The regulations refer to the Stormwater Management Guidebook, dated April 2003. This guidebook includes practices of controlling stormwater runoff meeting certain release rates for newly developed sites, and it includes methods for improving the quality of stormwater runoff. The following describes some of these requirements.

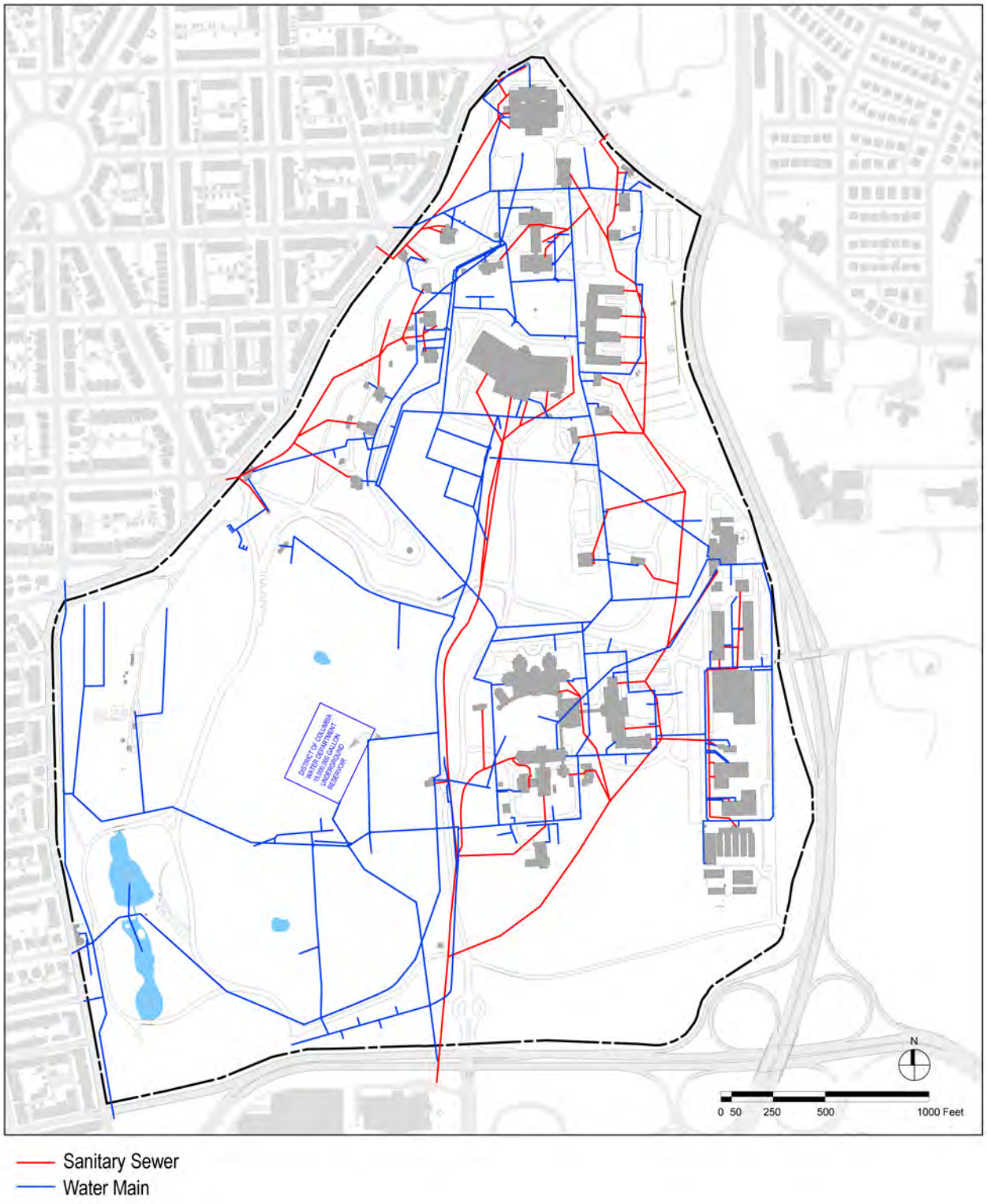


Figure 3-14: Water and Sewer

Stormwater management, quantity requirements: As per the *Stormwater Management Guidebook*, stormwater quantity controls are required to ensure that stormwater discharging off site is limited to pre-development flows. This alleviates additional load on the existing combined sewer system in an effort to reduce combined sewer overflow pollution. During short periods of intense rainfalls and when the combined sewer systems reach their capacity limits for treatment at the Blue Plains Wastewater Treatment Plant, wastewater is diverted to a discharge system without treatment. This situation is referred to as "combined sewer overflow pollution". One of the benefits of providing stormwater management quantity protection is that it detains stormwater discharging off the site to its pre-development rate, as described earlier, and thus tends to minimize the "combined sewer overflow pollution."

Stormwater management, quality requirements: For most storm events, studies show that the first flush, or first half-inch of rainfall, contains as much as 85 to 90 percent of surface water pollutants. For this reason, it is required that the first flush be detained and treated before leaving the site.

3.7.3 Electric Service

The Potomac Electric Power Company, Inc. (PEPCO) is the only distributor of electricity in the District of Columbia metropolitan area. Consumers in the area have the option to choose between several suppliers of electric generation services. Electric generation suppliers in the area include PEPCO, PEPCO Energy Services (PES), BGE Homes, and Washington Gas and Energy Services. As of November 2004, PEPCO had approximately 92.8 percent of the share of residential and non-residential generation and transmission services. Electrical lines run throughout the developed portions of AFRH-W property.

3.7.4 Natural Gas Service

Washington Gas supplies natural gas to the District of Columbia through a network of underground conduits fed through larger high-pressure transmission lines, generally located within street rights-of-way (see Figure 3-15). Natural gas lines run throughout the developed portions of AFRH-W property. Three steam boilers in the Heat Plant are fueled by natural gas.

3.7.5 Communication Service

Telephone service to AFRH-W is provided by Verizon Telephone Company.

3.7.6 Solid Waste

The District of Columbia Department of Public Works operates a fleet of trash hauling trucks that collect refuse from residences with less than four dwelling units. Buildings with four or more residential units and commercial enterprises must arrange to have a commercial trash hauler collect and dispose of their refuse. DCMR Title 21, Water and Sanitation, Sections 700 through 707 regulate the storage and collection of solid wastes.

Residential and commercial generators of trash are required by DC law (and DCMR Title 21, Sections 2021 and 2022) to separate out recyclable material (aluminum, glass, plastic, and paper) from the remainder of the refuse. District and commercial trash haulers are required to deliver the recyclable wastes to a recycling center. Solid waste from federal government facilities in the District of Columbia may be hauled by commercial trash haulers directly to the I-95 Resource Recovery Facility in Lorton, Virginia.

In the District of Columbia, there are several major commercial waste hauling companies that provide this service. For AFRH-W, the Defense Reutilization and Materiel Office (DRMO) Ft. Meade processes and landfills the waste. Biomedical waste and sharps are picked up by a service contractor.

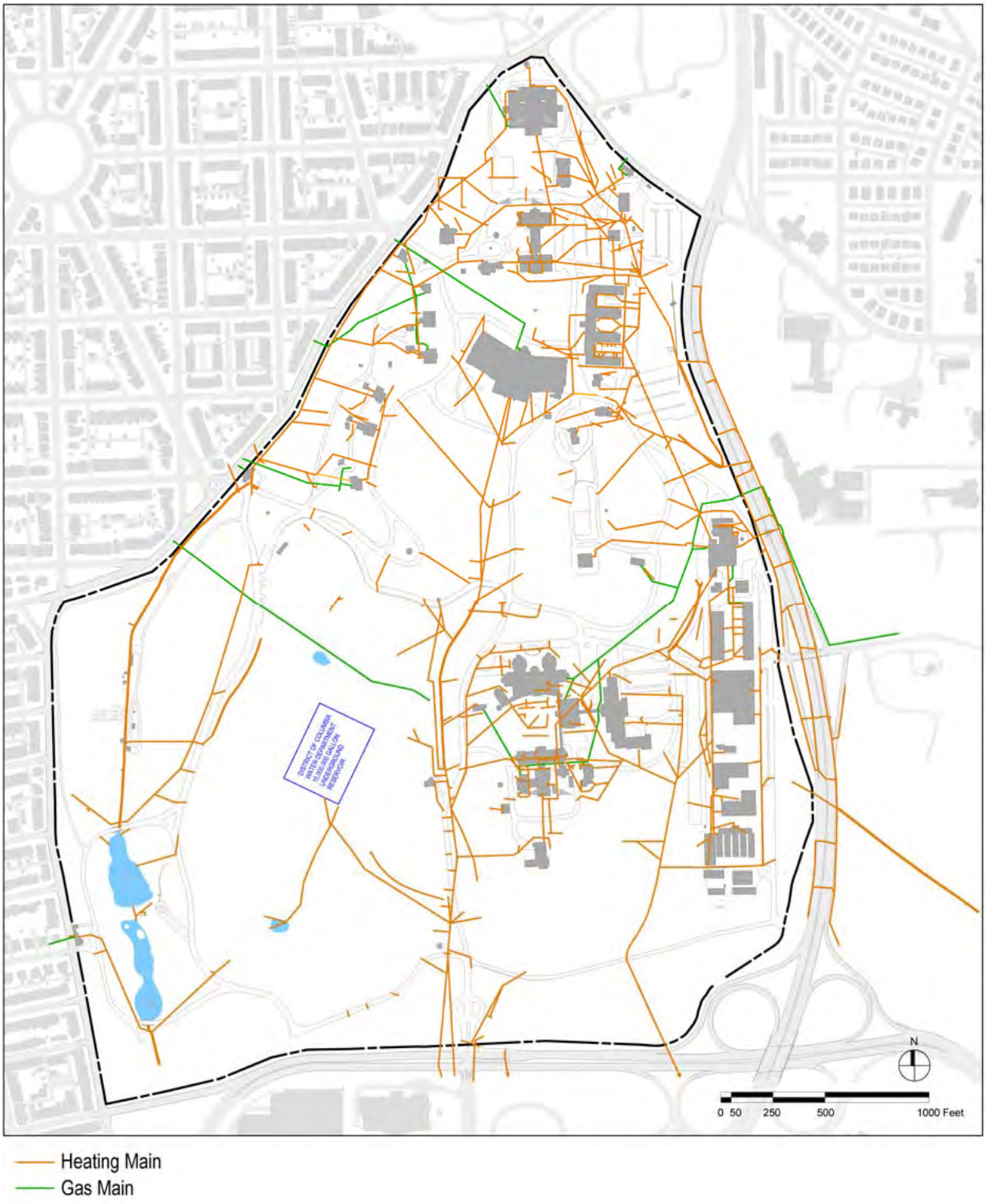


Figure 3-15: Gas and Heating

3.8 Environmental Contamination

A Phase I Environmental Site Assessment (ESA) was conducted for AFRH in July 2004, and a Phase II ESA was completed in April 2006 (MACTEC, 2007). Based on information provided in the Phase I ESA, asbestos abatement had been sporadically performed when buildings on the campus were renovated (G&O, 2004). An Operations and Maintenance (O&M) program had not been implemented for the management of asbestos-containing materials (ACMs) at AFRH campus (G&O, 2004).

No studies have been reviewed for the preparation of this EIS to indicate lead-based paint (LBP) surveys or hazardous materials surveys have been performed to confirm the presence, location, and quantity of hazardous materials at AFRH. Due to the age on site structures, it is possible that ACMs, LBP, polychlorinated biphenyls (PCBs), mercury and other hazardous materials are present at AFRH.

The Phase I ESA identified several recognized environmental conditions associated with on-site facilities and waste management practices, which were further investigated in the Phase II study.

Phase II sampling activities included the investigation of suspect UST areas, a former laundry facility, former pesticide/herbicide storage facilities, areas of hydraulic lifts, and incineration ash waste/dumping areas. Dye tracer studies, geophysical surveys, a regulatory file review, and reviews of previously prepared reports were also performed as part of the Phase II ESA study (MACTEC, 2007). The Phase II ESA did not include underground storage tank (UST) removals, UST tightness testing, asbestos or lead-based paint sampling, remediation or the characterization/removal of drums or containerized waste materials.

The Phase I ESA revealed three USTs were actively being used in 2004 (G&O, 2004). Geophysical surveys, performed as part of the Phase II ESA, were used to assess the presence of anomalies that could be USTs (MACTEC, 2007). According to information provided in the Phase II, many USTs have been present at AFRH throughout the life of the campus. Table 3-11 depicts the approximate location, status and contents (if known) of each tank believed to have been present at AFRH. MACTEC Engineering and Consulting, Inc. performed a file review with the D.C. Fire Department, which revealed a 300-gallon UST was removed from AFRH campus in 1998; however, no building number of location reference was provided in the paperwork (MACTEC, 2007).

Table 3-11: Underground Storage Tanks at AFRH

Building/ Location	Size (gallons)	Contents	Status	Comments
17	400	Diesel	Inactive	Documented removal - NFRAR
26/27	500	Diesel	Unknown	Undocumented closure performed
43	500	Used oil	Unknown	Documented removal - NFRAR
46/46A	Unknown	Unknown	Inactive	At least two USTs remain
52	500	Diesel	Active	
56	1,500	Diesel	Active	
64	1,000	Diesel	Active	1,200-gal UST removed and bioventing soil remediation in 1994
74A	500	Diesel	Unknown	Undocumented closure performed
75	8,000	Gasoline	Inactive	Three USTs removed and soil remediation in 1990/1991 (8,000-gal UST no longer in use)
75/76	Unknown	Unknown	Unknown	Geophysical evidence of at least six USTs

NFAR – "No Further Assessment Required" based on the Phase II ESA prepared by MACTEC (2007)

Geophysical Surveys: A geophysical survey was completed in the areas west and southeast of Building 75 and between Building 75 and Building 76 to evaluate the potential presence of former or existing USTs that may not have been removed from the ground (MACTEC, 2007). Subsurface anomalies representing six suspected buried USTs were noted along the west and southwest sides of Building 75 (MACTEC, 2007).

A geophysical survey was also conducted at Building 46 to determine the presence of USTs. Two suspect vent pipes, a fill port and two man-way covers were observed along the southwestern wall of Building 46 (MACTEC, 2007). The geophysical survey indicated the presence of "one or several" USTs (MACTEC, 2007). Based on this information at least two USTs are present at Building 46.

Following are MACTEC's Phase II ESA (2007) findings presented by building number/environmental concer:

- **Paint Can Repository.** "A file review of regulatory documents from the USEPA Region III related to a "No Further Remedial Action Planned" (NFRAP) listing for AFRH-W was also completed. Based on the documents reviewed, AFRH procured several thousand war surplus cans of paint in 1947 to be used in maintenance activities at the

facility. When the paint was determined not to be suitable for use, the paint cans were buried in a storage cell several feet deep in the area northwest of Building 72, where a current paved road exists. During 1990 hot water/steam system installation activities, these paint cans and approximately 1,000 tons of xylenes contaminated soil, were removed down to a depth of approximately 30 feet and the excavation backfilled. Five ground-water monitoring wells (designated by ABB Environmental Services, Inc. as MW-1, 2, 3, 4 and 5) were also installed in this area. Laboratory analysis of soil and groundwater samples collected from these wells did not have detectible xylenes concentrations, and the case was subsequently closed by the USEPA. Three of these wells were sampled during the Phase II and were designated as W72-1 (ABB well MW-4), W72- 2 (ABB well MW-1) and W72-3 (ABB well MW-5)."

- **Building Floor Drains. "**Based on the results of floor drain dye tracer testing performed at Buildings 46, 72, 76 and 77, these floor drains discharge directly into either the sanitary sewer or an oil-water separator, and not into the storm-water system, or into a related illicit discharge location."

- **Building 46: "**Drycleaning and laundry operations activities have reportedly been performed in the past at Building 46 (i.e., Building 46A). Potential hazardous wastes generated by drycleaning operations are primarily solvents, and historically have included petroleum solvents such as Stoddard (naphtha), and other solvents such as tetrachloroethene (also known as perchloroethylene; PCE) and valclene (fluorocarbon 113 or trichlorotrifluoroethane). Naphthalene was detected in soil at Building 46 at a concentration of 1,820 ug/kg, and a distinct 'moth ball' odor (commonly associated with naphthalene) was noted in soil samples collected from boring G46-1. In addition, various other VOCs (acetone, carbon disulfide, tetrachloroethene, trichloroethene, and 1,2,4-trimethylbenzene) were detected in soil at levels below their respective USEPA Risk-Based Concentrations (RBCs) and DC Risk-Based Screening Levels (RBSLs). Based on this data, the elevated naphthalene concentrations detected in soil at G46-1 are apparently associated with a release or spill from historical drycleaning activities at Building 46. In addition, the presence of PCE and its daughter product TCE, suggest that PCE was also utilized at Building 46 for drycleaning activities. The W46-1 groundwater sample had concentrations of 1,2-dichloroethane (1.49 ug/L) and 1,2,3-trichloropropane (32.5 ug/L), which exceeded their respective tap water RBCs, although bromomethane (1.76 ug/L) was less than its RBC. 1,2-dichloroethane is a daughter or breakdown product for the dehalogenation of PCE, while 1,2,3-trichloropropane is a solvent, paint, and varnish remover and a cleaning and degreasing agent. In addition, the groundwater sample

collected in W72-1 (located approximately 200 feet downgradient of Building 46) had detectible concentrations of PCE, TCE and cis-1,2-dichloroethene which exceeded their respective tap water RBCs, while PCE and TCE also exceeded their respective Maximum Contaminant Levels (MCLs). Although it can be inferred that the chlorinated solvents detected in W72-1 were from a drycleaning solvent spill or release in the area of Building 46, no actual "source area" was identified, and historic paint can disposal activities northwest of Building 72 could also be contributing to their presence."

- **Building 48 (Golf Course Maintenance Shed/Bathrooms): "**Two pesticides, beta-BHC (0.0276 mg/kg) and methoxychlor (0.052 mg/kg), were detected in soil at Building 48, while the remaining pesticides and herbicides analyzed were Not Detected (ND). The methoxychlor concentration was less than its RBC, while no RBC exists for beta-BHC. Various metals detected in soil included arsenic, barium, cadmium, chromium, lead, and mercury. Arsenic concentrations detected exceeded its RBC and RBSL, while cadmium and chromium exceeded their respective RBSLs only. Although no RBC or RBSL exists for mercury, mercury was detected in soil at concentrations ranging from 0.137 to 0.46 mg/kg. Arsenic, mercury, and lead are potential byproducts associated with pesticides, although these metals can be found naturally occurring. The W48-1 groundwater sample was ND for pesticides and herbicides, although relatively low concentrations of the metals barium, cadmium, chromium, and lead were detected (at concentrations less than their respective RBCs, MCLs and DC Ground-Water Quality Standards). Based on this data, shallow soil in the area of HA48-3 has been impacted by pesticides, although detected concentrations were less than available RBCs. The metals detected in soil and ground water are likely from naturally occurring metals."

- **Building 75: "**Vacuum assisted 'soil knifing' borings were completed at each of the six suspect UST locations near Building 75, to collect soil samples for analysis (MACTEC, 2007). No indications of existing USTs were identified and soil TPH-DRO/GRO concentrations were not detected, aside from a trace TPH-DRO of 5.6 mg/kg."

- **Building 76:** An abandoned oil-water separator is present in this building. It has been determined through a dye tracer test conducted as part of MACTEC's Phase II ESA study, that drainage from Buildings 46, 72, 76 and/or 77 are collected here.

- **Building 77: "**A distinct 'pesticide' odor and apparent pesticide/herbicide residue were observed coating the concrete floor inside of the Building 77 Pesticide Storage Room. However, soil samples collected beneath the concrete slab-on-grade and from beneath the

adjacent asphalt parking surface were ND for pesticides and herbicides (although the metals barium, chromium, and lead were detected). Chromium in soil exceeded its RBSL, but did not exceed its RBC. The W77-1 ground-water sample was ND for pesticides and herbicides, aside from the herbicide MCPP (detected at 132 ug/L). The MCPP concentration detected exceeded the 37 ug/L tap water RBC. Relatively low concentrations of the metals barium, cadmium, and mercury were detected in ground water below their respective RBCs, MCLs and DC Ground-Water Quality Standards (except for cadmium which exceeded its DC Water Quality Standard). The metals detected in soil and ground water are likely from naturally occurring metals."

- **Building 78:** "Soil samples collected at Building 78 were ND for pesticides and herbicides, aside from the pesticides 4,4'-DDE (detected at 0.0023 mg/kg) and methoxychlor (detected at 0.00329 mg/kg). However, the 4,4'-DDE and methoxychlor concentrations were less than their respective RBCs. An unknown "chemical" odor was also noted in several of the soil samples collected near the surface in borings H78-2, 3, 5 and W78-1; however, organic vapor concentrations for these soil samples measured on site using a photoionization detector (PID) were generally less than 2 parts per million. Various metals including arsenic, barium, chromium, and lead were detected in soil. Aside from chromium which exceeded its RBSL, the other metals did not exceed their respective RBSLs or RBCs. The W78-1 groundwater sample was ND for pesticides and herbicides. Relatively low concentrations of the metals barium, cadmium, chromium, and lead were also detected in ground water. Cadmium was greater than its DC Water Quality Standard while lead exceeded its MCL and DC Water Quality Standard. Based on this data, limited pesticide impact to shallow soils has occurred in the various greenhouses at Building 78, although no pesticide/herbicide impact to ground water was detected. The metals detected in soil and ground water are likely from naturally occurring metals."

- **Building 69:** "The composite sample of the ash waste material inside of the incinerator ash cleanout chute at Building 69 was ND for Toxicity Characteristics Leaching Procedure (TCLP) VOCs, SVOCs, pesticides and herbicides; and ignitability, corrosivity, and reactivity did not indicate hazardous waste characteristics. However, the TCLP lead concentration of 13.3 mg/L, was greater than the 5.0 mg/L regulatory standard (other metals did not exceed their associated regulatory standards). Based on this data, ash waste material located inside of the incinerator is a lead characteristic hazardous waste."

- **Building 76:** "Total petroleum hydrocarbons-diesel range organics (TPH-DRO) concentrations up to 1,420 mg/kg were detected in soil at Building 76, which is greater than the DC release reporting level of 100 mg/kg and is also greater than DC Tier 1 RBSL (aka the Soil Quality Standard; typically used as a cleanup standard on leaking UST sites) of 960 mg/kg. PCBs were ND in each soil sample, while butyl benzyl phthalate was the only SVOC detected (at 0.643 ug/kg) which was less than its RBC and RBSL. These borings were located adjacent to hydraulic lifts, and apparently represent hydraulic oil releases from hydraulic lifts or hydraulic lines. The W76-1 ground-water sample had a relatively low TPH-DRO concentration of 415 ug/L, which was less than the DC Risk-Based Ground-Water Standard at the Point of Exposure concentration of 3,570 ug/L. Bis(2-ethylhexyl)phthalate was the only SVOC detected in ground water, although no RBC or RBSL exists for this constituent. Based on this data, no significant petroleum impact has occurred to ground water in the area of Building 76, although a significant impact to soil in the area of the hydraulic lifts has occurred, above DC reporting and soil cleanup guidelines."

- "Although the District of Columbia does not have guidelines regarding typical background levels for metals in soil, the adjacent State of Maryland does have published Anticipated Typical Concentrations (ATCs) for various metals, according to the various Geologic Provinces in the State. The ATCs for Eastern Maryland (generally the same as the Coastal Plain soils at AFRH site) are 3.6 mg/kg for arsenic, 28 mg/kg for chromium, and 0.51 mg/kg for mercury. These ATCs are generally in line with metals concentrations detected at AFRH-W Buildings 48, 77, and 78, suggesting the metals are naturally occurring background levels. In addition, where pesticides were detected in soil at H48-3, H78-1 and H78-6, corresponding metals at those locations were not significantly higher than other locations where no pesticides were detected."

4 ENVIRONMENTAL CONSEQUENCES

This section includes an analysis of the environmental consequences or "impacts" of the Master Plan Alternatives as well as the No Action Alternative. Each alternative is described in detail in Section 2.1, Alternatives Studied in Detail. As stated in Section 2.1.1, the No Action Alternative provides a baseline for assessing the magnitude of environmental effects of the action alternatives.

Every attempt has been made to assess impacts that could occur from the Master Plan Alternatives, as well as the No Action Alternative. The Master Plan Alternatives shown in Chapter 2 are conceptual and building layouts have not been finalized. Therefore, impacts have been assessed assuming that development could affect all resources within the various development zones.

Direct, indirect, and cumulative impacts have been assessed. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative impacts are the impacts on the environment, which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. (40 CFR 1508.7 – 1508.8)

Potential impacts are described in terms of:

- *intensity*, the effects are negligible, minor, moderate, or major;
- *type*, the effects are beneficial or adverse;
- *duration*, the effects are short-term, lasting through construction or less than one year, or long-term, lasting more than one year; and
- *context*, the effects are site-specific, local, or even regional.

The thresholds of change for the intensity of impacts are defined as follows:

- *negligible*, the impact is localized and not measurable or at the lowest level of detection;
- *minor,* the impact is localized and slight but detectable;
- *moderate,* the impact is readily apparent and appreciable; or

- *major,* the impact is severely adverse and highly noticeable.

This section also includes information on measures to mitigate the impacts at the end of each impact topic.

4.1 Natural Resources

4.1.1 Geology, Topography, and Soils

The general geologic conditions of the project area are discussed in Section 3.1.1 of this EIS. Construction on steep slopes and in highly erodible soils produces the potential for soil erosion at rates greater than that which would occur under natural conditions. In general, soils with slopes in excess of 15 percent are considered to have a very severe erosion potential. AFRH-W is characterized by gentle slopes, which range from 0 to 15 percent.

No Action Alternative

Under the No Action Alternative, the proposed development under the Master Plan at AFRH-W would not take place and there would be no direct, indirect, or cumulative impacts to geology, soils, or topography.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Under all of the Master Plan Alternatives, grading, clearing, and construction activities for the proposed development would alter the topography and soils within the project area. No impacts to geology would occur.

Direct Impacts

Disturbance to the physical landscape in the development zones would occur as a result of the implementation of any of the Master Plan Alternatives. Under each of the Master Plan Alternatives, land within AFRH-W would be cleared and graded. Table 4-1 provides the approximate acreage of land that would be disturbed under each alternative. Development within all zones proposed for development at AFRH-W would result in direct, long-term, moderate, adverse impacts to topography and soils from clearing and grading activities. Development would not occur in areas with steep slopes and substantial soil erosion would not be induced by construction activities. A sediment and erosion control plan will be implemented in accordance with District of Columbia regulations. In addition, in Zone A the developer would restore some of the original topography near the meadow and in Zone C development will

respect the original topography to the extent possible. Indirect impacts to stream quality and aquatic biota from increased erosion are discussed in Sections 4.1.2, Water Resources and 4.1.3, Biological Resources. Appropriate mitigation measures as described below would be implemented to minimize impacts from this erosion.

Table 4-1: Approximate Area of New Land Disturbance

	Land Disturbance (Acres)				
	the AFRH Zone	**Zone A**	**Zone B**	**Zone C**	**Total Disturbance**
Alternative 2	10.8	23.2		3.6	37.5
Alternative 3A	10.8	12.6	3.5	7.6	34.5
Alternative 3B	10.8	12.6	3.5	7.6	34.5
Alternative 3C	10.8	12.6	3.5	7.6	34.5
Alternative 4	10.8	16		7.4	34.1

Indirect Impacts

Because an erosion and sedimentation control plan would be followed under all of the Master Plan Alternatives, indirect adverse impacts from soil erosion are anticipated to be minor and short-term. Appropriate mitigation measures as described below would be implemented to minimize impacts from this erosion.

Cumulative Impacts

The proposed action, when added to past and reasonably foreseeable future projects in the vicinity of AFRH-W, would result in long-term, minor, adverse, cumulative impacts to the geologic, soil, and topographic conditions in the project area. Development in the Georgia Avenue – Petworth Area along with development of the McMillan Reservoir and the Washington Hospital Center would cumulatively add to the impacts of AFRH-W development. Like AFRH-W, these developments would be required to comply with erosion and sediment control requirements to mitigate impacts.

Mitigation Measures

Under the proposed action, soil suitability would be determined and appropriate building foundation specifications would be developed. A detailed erosion and sedimentation control plan would be developed prior to construction, based on the requirements of the Watershed Protection Division of the DC Department of Environment. Development of this plan would ensure that appropriate soil erosion and sediment control measures are enacted during construction to minimize soil erosion.

4.1.2 Water Resources

4.1.2.1 Groundwater Hydrology and Quality

Development of any site results in an increase in impervious area, which reduces the land available for recharging groundwater. The total area available for water percolation through the soil to underlying aquifers is reduced by the addition of impervious areas. Impervious areas include parking lots, roofs, roadways, and walkways. Groundwater quality also can be affected by improper turf maintenance, which could result in groundwater percolation of suspended solids from erosion or of chemical contaminations such as pesticides or nutrients. Increases in suspended solids from erosion or chemical contaminations through rapid runoff from impervious surfaces, can also impact groundwater quality. Groundwater quality can also be affected by leaks or spills that cause contamination.

No Action Alternative

Under the No Action Alternative, impacts to groundwater quality and hydrology from the existing on-site development at AFRH-W would still occur. Groundwater quality and hydrology may also be affected by ongoing turf maintenance or runoff from impervious surfaces at AFRH-W. However, because no new construction would occur at AFRH-W, no additional impacts would occur.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct and Indirect Impacts

There would be no direct impacts to groundwater hydrology or quality under the Master Plan Alternatives. Groundwater is not used for either potable or industrial purposes at AFRH-W, nor would it be used for such purposes under the proposed action.

Because the region within the watershed is entirely urbanized, the increase in impervious surfaces from the proposed development at AFRH-W would add a minor amount to the total surfaced area (see Table 4-2). In addition, a large amount of pervious vegetated surface, particularly in the region of the golf course at AFRH-W, would not be developed, allowing for groundwater recharge. Therefore, the increase in impervious surface area at AFRH-W under the Master Plan Alternatives would have an indirect, long-term, negligible, adverse impact on recharge of groundwater aquifers.

Cumulative Impacts

Past development and future projects such as the McMillan Reservoir redevelopment increase impervious surfaces and have cumulative impacts on groundwater recharge. However, because AFRH-W Master Plan Alternatives maintain a large area of open space, the proposed project would add a minor amount to the impact of other development resulting in a long-term, minor, adverse, cumulative impact on groundwater recharge and quality in the project area.

Mitigation Measures

Proper precautions would be taken to prevent transport of contaminants during construction and excavation activities. The amount of mowed lawns would be minimized and integrated pest management techniques would be used during landscaping and turf maintenance practices to reduce the potential for altering groundwater quality.

Mitigation for the increase in impervious area would be achieved by the use of infiltration devices to capture stormwater runoff and divert it to the subsurface. Such devices must be located at sites capable of percolating the water from the surface to the subsurface and designed in compliance with applicable stormwater management regulations. Soils at potential infiltration device locations must be tested for their ability to accept water.

Table 4-2: Impervious Area By Alternative

	Existing Impervious Area (Acres)	Impervious Area Post-Development (Acres)
Alternative 2		
the AFRH Zone	17.6	28.4
Zone A1	30.4	40.6
Zone A2 & B	3.5	16.6
Zone C	0.6	4.2
Total Disturbance		89.7
Alternative 3A		
the AFRH Zone	17.6	28.4
Zone A	33.9	43.0
Zone B	0.0	3.5
Zone C	0.6	8.2
Total Disturbance		86.6
Alternative 3B		
the AFRH Zone	17.6	28.4
Zone A	33.9	46.5
Zone B	0.0	3.5
Zone C	0.6	8.2
Total Disturbance		86.6
Alternative 3C		
the AFRH Zone	17.6	28.4
Zone A	33.9	43.0
Zone B	0.0	3.5
Zone C	0.6	8.2
Total Disturbance		86.6
Alternative 4		
the AFRH Zone	17.6	28.4
Zones A & B	33.9	49.8
Zone C	0.6	8.0
Total Disturbance		86.3

4.1.2.2 Surface Water

Direct impacts to water resources occur when a stream is directly altered so that the surface water hydrology is changed; water quality is degraded; or aquatic habitat is diminished or lost. Examples of direct impacts include when a stream is placed in a culvert under a road; thus, a portion of the natural stream bottom and banks are replaced with concrete.

Indirect impacts to water resources result from the creation of impervious surfaces, such as parking lots and rooftops, when development occurs. Impervious surfaces increase the volume of surface water runoff during precipitation events and decrease the area available for water infiltration into the ground. As a result, peak flows in area streams are higher and base flows are lower. Extremely high flows can cause erosion of stream banks and scouring of the streambed.

Additionally, surface water runoff from parking lots and rooftops raises in-stream water temperatures (thermal loading) and transports fine sediments and pollutants into streams. Surface water runoff from roads and parking lots may transport oils, greases, heavy metals, and deicing agents to streams, all of which degrade water quality.

No Action Alternative

Under the No Action Alternative, the proposed development under the Master Plan at the AFRH-W would not take place. Surface water would continue to be diverted into the paved channels, the stormwater retention pond, and the fishing ponds that exist at the site. Surface water would continue to contain chemicals common in stormwater runoff or chemicals obtained from impervious surfaces, such as roadways or rooftops. However, under the No Action Alternative, no additional impacts would occur that would affect surface water hydrology, floodplains, water quality, or aquatic resources.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

Under the Master Plan Alternatives, surface water features on AFRH-W site may be directly affected. Under all of the alternatives, concrete channelized streams may need to be diverted, and relocation of the channelized streams would have a direct, short-term, minor, adverse impact on surface water resources. No construction is proposed in the region of the fishing ponds, located in the southwestern portion of the site.

Site development on AFRH-W campus would result in temporary impacts to stormwater quality. Disturbance of soils on the site increase the potential for sediment and contaminants to be transported off of the site during a storm. This impact would be temporary, lasting the duration of construction, and would be mitigated by the use of sediment and erosion control measures (see Mitigation Measures). Therefore, a direct, short-term, minor, adverse impact is anticipated.

Indirect Impacts

The construction of the development zones at AFRH-W would increase the impervious area in the project area as described in Section 4.1.1, Geology, Topography and Soils. As discussed above, impervious areas increase the amount and temperature of runoff, which may increase the peak discharges and temperatures in the receiving paved channels, the stormwater retention pond, and the fishing ponds. Higher discharges in a stream can cause erosion and flooding problems downstream. These indirect, long-term, moderate, adverse impacts would affect the paved channels, the stormwater retention pond, and the fishing ponds at AFRH-W.

For each of the alternatives under the Proposed Action, the amount of imperviousness of the site would increase, thus increasing the amount of runoff generated by the site. Table 4-3 presents estimated pre- and post-development values for percent imperviousness of the six development zones for each alternative. The percent impervious area was calculated using percent imperviousness values from the *Natural Resources Conservation Service Technical Release 55, June 1986*. These values are based on land use. For zones containing more than one land use type, a weighted average was calculated using square footage information within each zone.

Table 4-3: Percent Impervious Area

	the AFRH Zone	Zone A	Zone B	Zone C
Pre-Development	60%	60%	0%	5%
Alternative 2 Post-Development	75%	75%	70%	66%
Alternative 3A Post-Development	75%	75%	70%	66%
Alternative 3B Post-Development	75%	75%	65%	70%
Alternative 3C Post-Development	75%	80%	65%	70%
Alternative 4 Post-Development	75%	67%	67%	65%

Stormwater management, quantity

For each of the alternatives, because of substantial increases in impervious area, there would be a subsequent increase in stormwater runoff. Therefore, the developed sites would be subject to stormwater management requirements pursuant to DCMR Title 21, Sections 538 through 545. Stormwater management quantity requirements dictate that controls must be put in place to ensure that the post-development peak runoff is equal to or less than the pre-development runoff for the 15-year storm event. Table 4-4 presents approximate peak runoff flows from the six proposed development zones for 2- and 15-year storm events, as well as water quantity storage requirements for each of the alternatives.

Table 4-4: Post Development Runoff and Required Water Quantity Storage

	2-year Runoff (Cubic Feet per Sec.)	15-year Runoff (Cubic Feet per Sec.)	Req'd. Quantity Storage (Cubic Feet)
Alternative 2			
the AFRH Zone	159	228	16,828
Zone A1	223	312	22,701
Zones A2 & B	87	124	19,391
Zone C	91	130	21,805
Alternative 3A			
the AFRH Zone	159	228	16,828
Zone A	289	406	34,336
Zone B	21	31	2,682
Zone C	47	68	8,042
Alternative 3B			
the AFRH Zone	159	228	16,828
Zone A	289	406	34,336
Zone B	21	31	2,682
Zone C	49	70	8,643
Alternative 3B			
the AFRH Zone	159	228	16,828
Zone A	289	406	24,336
Zone B	21	31	2,682
Zone C	49	70	8,643
Alternative 4			
the AFRH Zone	159	228	16,828
Zones A & B	254	361	39,288
Zone C	46	66	13,506

These storage requirements may be satisfied with an underground sand filter structures that can be designed to provide both water quality and quantity management for a limited area. It is anticipated that most of the required water quantity management volume will be provided by two stormwater management ponds. The pond for the east drainage system would be situated in the

open space immediately north of Pershing Drive and adjacent to the crescent road. The pond for the west drainage area would be located in the area west of First Street north of Pershing Drive. If all of the quantity management requirements within a drainage area can be met by smaller localized BMP measures, then the stormwater management pond serving that drainage area would need only to serve for quantity management then the structure would be designed as a dry detention base. If both water quality and quantity goals are to be met by the ponds, then it would most likely be a wet detention or retention pond, or a combination pond and wetland.

Stormwater management, quality

As previously discussed, the first half-inch of runoff generally contains between 85 and 90 percent of the pollutants in the initial runoff volume. The District of Columbia's management strategy for treating stormwater is to capture and isolate the first-flush runoff from impervious surfaces within the contributing drainage area. Post-development land use characteristics and projected future activities of the impervious area determine the depth of runoff that must be held for water quality treatment. Table 4-5 presents the approximate impervious area and required water quality storage volume required for the six proposed development zones for each alternative.

Table 4-6 illustrates the annual pollutant levels that would be expected to leave the site assuming stormwater management ponds are employed to address effluent water quality for each of the alternatives. Removal rates for the pollutants vary depending on the Best Management Practice (BMP) used and the type of pollutant. In addition, removal rates for stormwater management ponds represent the approximate mean of all types of BMPs. Approximate removal rates can be found in the DC Storm Water Management Guidebook. These pollutant loads are determined by using the Simple Method for a developed site and then applying the expected pollutant removal factors for this type of water quality strategy.

Existing stormwater conveyance systems may be used for post-development runoff. Where possible, the open channel systems on AFRH-W should be utilized to alleviate additional loads on the combined sanitary/stormwater sewer system. With implementation of stormwater management practices and the reduction in potential contaminant sources, it is anticipated that development would have indirect, long-term, minor, adverse impacts on the quality of the stormwater runoff when compared to the existing conditions at the site.

Cumulative Impacts

The proposed action, when added to past and future projects in the vicinity of AFRH-W, would result in the possibility of increased levels of sedimentation, pollutants, and thermal loading in streams in the project area resulting in a long-term, moderate, adverse, cumulative impact to surface water quality.

Development and increased impervious surface area would cumulatively affect stormwater runoff. However, the application of stormwater controls with AFRH-W Master Plan Alternatives, as well as stormwater management required for other future development in the area, would mitigate the impact on the combined sanitary/stormwater sewer system and reduce combined sewer overflow pollution.

Table 4-5: Water Quality Detention Volume Requirements

	Impervious Area (Sq. Ft.)	Water Quality Detention Vol. (Cu. Ft.)
Alternative 2		
the AFRH Zone	1,237,757	41,258
Zone A1	1,766,794	58,893
Zone A2& B	722,660	24,089
Zone C	687,115	22,904
Alternative 3A		
the AFRH Zone	1,237,757	41,258
Zone A	2,024,234	67,474
Zone B	176,418	5,881
Zone C	358,935	11,965
Alternative 3B		
the AFRH Zone	1,237,757	41,258
Zone A	2,024,234	67,474
Zone B	176,418	5,881
Zone C	375,052	12,502
Alternative 3C		
the AFRH Zone	1,237,757	41,258
Zone A	2,024,234	67,474
Zone B	176,418	5,881
Zone C	375,052	12,502
Alternative 4		
the AFRH Zone	1,237,757	41,258
Zone A & B	2,169,288	72,310
Zone C	348,262	11,609

(Source: DC Storm Water Management Guidebook, 2003)

Table 4-6: Estimate of Total Annual Pollutant Loads (lbs/yr)

	Total Suspended Solids	Total Phosphorous	Total Nitrogen	Zinc
Alternative 2				
the AFRH Zone	4,755	176	1,810	69
Zone A1	4,469	264	2,721	12
Zones A1 & B	1,900	96	990	5
Zone C	2,640	87	892	4
Alternative 3A				
the AFRH Zone	4,755	176	1,810	69
Zone A	5,220	262	2,690	13
Zone B	596	19	199	1
Zone C	1,358	45	465	2
Alternative 3B				
the AFRH Zone	4,755	176	1,810	69
Zone A	5,220	262	2,690	13
Zone B	596	19	199	1
Zone C	1,358	45	465	2
Alternative 3C				
the AFRH Zone	4,755	176	1,810	69
Zone A	5,220	262	2,690	13
Zone B	596	19	199	1
Zone C	1,358	45	465	2
Alternative 4				
the AFRH Zone	4,755	176	1,810	69
Zones A & B	5,536	279	2,857	14
Zone C	1,358	44	453	2

(Source: DC Storm Water Management Guidebook, 2003)

Mitigation Measures

As required by law, on-site stormwater management controls would be provided to limit the amount of storm runoff leaving the site during a storm event and to reduce the amount of contaminants in that runoff. Stormwater quantity and quality management practices required by DCMR would ensure no increase in post-development runoff peak flow and would mitigate the impacts of increased stormwater runoff on the combined sewer system.

The stormwater storage requirement for the site can be satisfied with stormwater management ponds, underground sand filter structures for both quality and quantity control, and a variety of urban Best Management Practices (BMPs). These include bioretention devices, water quality catch basins, manufactured water quality BMP's, and green roofs. The layout and sizing of each individual BMP will be fitted to the requirements of the local structure, road, or parking area it serves. In order to minimize the problem of "combined sewer overflow pollution," low impact best management practices may be employed to reduce the effects of stormwater. In addition, available green spaces may be used as a place to discharge stormwater from rooftops, parking lots, and streets to take advantage of infiltration and reduce stormwater loads on the combined sewer system.

To reduce the effects of construction on stormwater runoff, DCMR Title 21, Sections 538 through 545 requires the use of sediment and erosion control practices that would minimize the amount of sediment leaving the site. The practices are included in the DC Erosion and Sediment Control Handbook and are specified as part of an engineered plan. When these practices are implemented correctly, the amount of sediment leaving the site would be within acceptable tolerances. The Watershed Protection Division has the responsibility to enforce the maintenance of these temporary protective devices.

Under Alternative 3A, the developer of Zone A, which is the only zone for which a developer has been selected, anticipates providing most of the required water quantity management volume by a series of three storm water management ponds. The ponds for the east drainage system will be situated in the southern portion of the open space immediately north of Pershing Drive and adjacent to the north-south crescent-shaped road in the developer's plan. The pond for the west drainage area will be located in the area north of Pershing Drive near the western boundary of Zone A.

If all of the water quantity management requirements within a drainage area can be met by smaller, Best Management Practices (BMPs) that are designed to serve individual buildings or paved areas, then the stormwater management pond serving that drainage area may be designed

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. The series of ponds in Zone A will likely be wet ponds with surrounding constructed wetlands areas.

Where possible, existing stormwater conveyance systems may be used for post-development runoff. The Zone A conveyance system north of the series of ponds will likely include open channel systems that are designed to provide stormwater quality benefits prior to discharging runoff into the wet pond system.

4.1.2.3 Wetlands

Wetlands are regulated under the Clean Water Act of 1972, as amended (33 USC s/s §1251-1387, *et seq.*). The purpose of the Clean Water Act is to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." Executive Order 11990 furthers the purposes of NEPA by directing federal agencies to "…avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative…" The USACE has been charged with evaluating federal actions that result in the potential degradation of the waters of the U.S. and issuing permits for actions consistent with the Clean Water Act.

No Action Alternative

The National Wetland Inventory map shows two recreational fishing ponds and three stormwater management ponds located on AFRH-W site. The two recreational fishing ponds and possibly the stormwater management pond located adjacent to Pershing Drive may be considered palustrine open water wetlands (POW) and may be placed under the USACE's jurisdiction. The D.C. Department of Environment may assert jurisdiction over the two isolated stormwater management ponds located on the golf course. If these ponds are indeed jurisdictional wetlands, then indirect impacts to them under the No Action Alternative would still occur. Runoff, due to impervious surfaces from AFRH-W, would continue to affect these receiving wetlands. However, because construction would not occur, no additional indirect or direct impacts would occur to the ponds.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct and Indirect Impacts

The Master Plan Alternatives may affect the stormwater management pond located adjacent to Pershing Drive, which would create a minor, adverse, long-term, direct impact. No other wetland areas would be impacted by the Master Plan Alternatives.

Under the proposed action, the increase in impervious surfaces could increase erosion and sedimentation, which could have an indirect, long-term, moderate, adverse impact on the potential wetlands at AFRH-W. The vegetation in the stormwater management pond and the fishing ponds in the project area could experience scouring, loss of sediments and loss of herbaceous vegetation. Increased flooding could expand the potential wetland boundary in some areas. Increased erosion due to scouring would increase sediment load in the tributaries, which could increase sedimentation and facilitate the conversion of the potential wetlands to uplands. Effective stormwater management and erosion control would minimize indirect impacts.

Cumulative Impacts

Past, present, and future development in the area could result in loss of wetland acreage. Cumulative impacts to wetlands and streams from on- and off-site development could result in increases in flooding, erosion, and sediment loads. Federal and DC regulations require replacement of wetlands to mitigate for project impacts. Therefore, development could have minor to moderate, adverse, long-term, cumulative impacts.

Mitigation Measures

Best Management Practices (BMPs) would be utilized to mitigate indirect and cumulative impacts to wetlands associated with the proposed action. Development in wetland areas is regulated by the USACE pursuant to the Clean Water Act (as implemented by 33 CFR 320-329, March 28, 2000, and 33 CFR 330, March 28, 2000). In the District of Columbia, development in wetlands or streams requires a permit from the USACE, Baltimore District issued pursuant to Section 404 (b) (1) guidelines of the Clean Water Act.

4.1.3 Biological Resources

4.1.3.1 Terrestrial Biota

No Action Alternative

Under the No Action Alternative, no new construction would occur on AFRH-W, and there would be no impacts to vegetation or wildlife.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

Due to AFRH-W's proximity to highly developed residential and urban areas, wildlife within the project area is limited to those species adjusted to human disturbance. Under the Master Plan Alternatives, impervious surfaces on AFRH-W would increase between 34 and 37 acres. Approximately 182 to 188 acres or 67 to 70 percent of AFRH-W would remain in open space and continue to provide wildlife habitat. Wildlife species would only be impacted by construction noise and activities. The Master Plan Alternatives would have direct, short-term, minor, adverse effects to wildlife.

Under all of the Master Plan Alternatives, portions of forested areas, mature trees, and meadow habitats could be replaced with developed areas. Within the AFRH Zone, portions of mature forested areas could be removed and replaced with residential housing. Within parts of the Zone A and Zones B and C, mature trees and meadow areas could be replaced with development. The impact to vegetation on AFRH-W would be direct, long-term, moderate, and adverse depending on how these buildings are sited in these zones.

Indirect Impacts

Development on AFRH-W would increase the amounts of airborne pollutants that are harmful to vegetation resulting in an indirect, long-term, minor, adverse effect to vegetation. Sulfur dioxide (resulting from burning fossil fuels for energy or heating) and ozone (resulting from a combination of atmospheric nitrogen and oxygen with unburned hydrocarbons from automobile exhausts) can cause dieback and general decline in vegetated areas. On-site habitats could be affected by these pollutants.

Cumulative Impacts

The proposed action, when added to past and reasonably foreseeable future projects in the vicinity of AFRH-W - such as the Washington Hospital Center, has the potential to have a cumulative long-term, moderate, adverse effect on forests and wildlife in the region. Located in an urban environment, AFRH-W is surrounded by development and is one of only a few areas of substantial landscaped green space remaining in the vicinity. Development of the McMillan Reservoir would further decrease the limited amount of plant and wildlife habitat available in the area resulting in a moderate long-term, adverse, cumulative impact to wildlife.

Mitigation Measures

Mitigation measures for effects to vegetation and wildlife primarily consist of maintaining large green space to provide for wildlife habitat and movement corridors. Adequate amounts of forest would be retained under all the proposed action alternatives to provide similar habitat to that which exists today. Revegetation of removed or damaged vegetation, as a result of construction activities, would also mitigate impacts to terrestrial biota. Careful siting of new buildings within zones noted above would help mitigate potentially adverse impacts.

When replacing historic plant material, use of the same species, or, if not available, a similar species that resembles the vegetation would occur. When rehabilitating or modifying the landscape resources, respect the historic relationship between the built and natural resources to endure the preservation of the landscape design would occur. AFRH is completing a landscape plan and will be replacing a number of trees that have been destroyed or damaged. The developer will need to use construction methods that avoid damage to tree roots and will be replacing historic trees along Pershing Drive and other historic stands that are damaged in construction or not in good shape today.

4.1.3.2 Aquatic Biota

Surface water runoff from parking lots and rooftops raises in-stream water temperatures (thermal loading) and transports fine sediments and pollutants into streams. Warmer stream temperatures can adversely affect some temperature-intolerant species. A buildup of fine sediments in the stream bed may smother fish eggs and larvae as wells as benthic macro invertebrates, which inhabit the interstitial spaces between the coarser gravel and cobble sediments. Increased levels of fine sediments may also negatively affect aquatic organisms (both fish and invertebrates) by

clogging the organisms' gills. Surface water runoff from roads and parking areas may transport oils, greases, heavy metals, and deicing agents to streams. These substances degrade water quality and are lethal to aquatic organisms when present in significant quantities. These substances can also coat gravel substrates, making them unfit for fish and benthic macro invertebrate eggs.

Indirect and cumulative impacts to aquatic resources result from increased amounts of surface water, sedimentation, and pollutants associated with the creation of impervious surfaces such as buildings and roads, as well as landscaped areas that receive pesticide and fertilizer applications, both from on-site and off-site sources.

No Action Alternative

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not take place. AFRH-W would continue to restock the fishing ponds. No construction would occur that would impact aquatic biota.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct and Indirect Impacts

No construction would take place directly in the fishing ponds. However, there would be a direct, short-term, major, adverse impact to water quality and thus to aquatic biota in the fishing ponds during the construction process from sediment and erosion. After construction, the pond water quality would gradually return. Under all of the alternatives, a loss of forested areas and open spaces would occur. Such vegetative loss would result in a decrease in the removal of pollutants associated with stormwater runoff, which would potentially enter the ponds. This reduction in vegetative cover would result in reduced input of outside nutrients and increased exposure to sunlight. A reduced input of nutrients to streams decreases the available food source for macro-invertebrates and fish. Increased exposure to sunlight typically produces indirect impacts such as increased water temperature, decreased dissolved oxygen, and increased algal growth. As vegetation matures around the new development, these negative impacts would be reduced.

With the creation of additional impervious surfaces and increased stormwater runoff, sedimentation, and pollutants there would be an indirect, long-term, minor, adverse effect on aquatic biota that exist in the ponds.

Cumulative Impacts

The proposed action, when added to past and future projects in the vicinity of AFRH-W, would have a negligible, long-term, adverse, cumulative effect on aquatic biota. Development in the Georgia Avenue – Petworth Area along with development of the McMillan Reservoir and the Washington Hospital Center would cumulatively add to the impacts of AFRH-W development. Like AFRH-W, these developments would have to comply with stormwater management requirements to mitigate impacts.

Mitigation Measures

Mitigation measures as described in Section 4.1.2.2, Surface Water would be taken to minimize the impacts to these onsite ponds during and after construction.

4.2 Social Environment

4.2.1 Population and Housing

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. There would be no direct, indirect, or cumulative impacts to population or housing under this alternative, as there would not be a displacement of population or elimination of housing stock.

Existing trends in population and housing would not be affected. Growth in area population would be incremental, based on normal growth factors, as new development occurs in the Metropolitan area in general and in Washington, DC in particular.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

There would be a direct impact to population and housing under Alternatives 2, 3A, 3B, 3C, and 4. New residential development would be constructed under all the Master Plan Alternatives. Under Alternative 2, 992,000 gsf of new residential development would be added; under Alternative 3A, 4,018,234 gsf would be added; under Alternative 3B, 4,781,819 gsf would be

added; under Alternative 3C, 4,189,331 gsf would be added; and under Alternative 4, 4,967,000 gsf would be added (see Table 4-7, Proposed Residential Development). This increase in housing stock would have a direct, long-term, moderate, beneficial impact on housing stock in the region.

Under the preferred alternative, Alternative 3A, there would be a direct, long-term, major beneficial impact through the increase in affordable housing. The developer of Zone A, the only zone for which a developer has been selected, would institute an affordable housing plan. The developer would construct affordable housing units as part of the development of parcels that include residential apartments and condominiums. Fifteen percent of the units would be available and affordable to households earning, as a maximum, between 60 and 80 percent of the Area Median Income. The affordable units would be the same size as the market-rate units for the unit type (i.e. one, two, and three bedroom units). The mix of unit types for affordable housing would be 60 percent one-bedroom, 30 percent two-bedroom, and 10 percent three-bedroom.

In addition, under Alternative 3A, there would be a 100-bed facility for veterans in transition from homelessness. This facility would not be a homeless shelter, and the operator would be require sobriety and participation in job training and/or employment as a condition of occupancy by veterans.

Table 4-7: Proposed Residential Development

Master Plan Alternative	Population Increase	Proposed Residential Development (gsf)			
		the AFRH Zone	Zone A	Zone B	Zone C
2	1,488	42,000	--	--	950,000
3A	6,027	42,000	2,346,234	880,000	750,000
3B	7,173	42,000	3,109,819	880,000	750,000
3C	6,284	42,000	2,517331	880,000	750,000
4	7,451	42,000	4,500,000		425,000

Population figures were projected based on an average housing unit size of 1,000 gsf with occupancy of approximately 1.5 persons per unit (ULI, 1994). It is expected that individuals would relocate into the area to occupy these housing units, resulting in an increase in population.

Approximately 1,488 individuals would relocate to AFRH-W under Alternative 2; approximately 6,027 individuals under Alternative 3A; approximately 7,173 individuals under Alternative 3B; approximately 6,284 individuals under Alternative 3C; and 7,451 under Alternative 4. Therefore, a long-term, minor, beneficial direct impact to population would occur.

Indirect Impacts

Implementation of the proposed Master Plan could indirectly affect the population and housing in the immediate vicinity of AFRH-W. The residential development planned in Zone C would be directly across from the Park View neighborhood. This new development would change the views from the established neighborhood from open space to additional residential development. This indirect impact would be long-term, moderate, and adverse from the perspective of those residents who may prefer to look out on open space, and positive for those residents who favor houses on both sides of the streets and the perceived sense of security and community that can accompany an urban design scheme.

It is not anticipated that substantial numbers of employees of the proposed commercial and institutional uses would relocate their residence to the vicinity of AFRH-W. Normal trends in DC's population and housing stock are anticipated to occur whether or not the Master Plan is implemented. The Master Plan Alternatives would have indirect, long-term, negligible, adverse impacts on the availability of housing outside of AFRH-W.

Cumulative Impacts

New residential development on AFRH-W, when added to past, present, and proposed residential development would have a cumulative, long-term, beneficial effect on the housing stock in Washington, DC by increasing the types, value, and availability of housing in the region. Development in the Georgia Avenue – Petworth area along with development of the McMillan Reservoir and Washington Hospital Center would add additional housing to the area.

Mitigation Measures

No mitigation measures for impacts to population and housing are proposed.

4.2.2 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, 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 and low-income populations. The Presidential Memorandum that accompanied the Executive Order recognizes the importance of procedures under NEPA to identify and address Environmental Justice concerns. The memorandum states that "each federal agency shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by [NEPA]."

The process followed by AFRH to identify potential disproportionate impacts associated with the proposed action and to ensure compliance with this directive was as follows:

- Identification of the potentially affected population in the study area;
- Characterization of the study area with respect to minorities and low-income populations;
- Determination of potentially significant adverse impacts of the proposed action and alternatives; and
- Evaluation of the potential for disproportionately high and adverse impacts on minority and low-income populations in the study area.

No Action Alternative

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be developed. As a result, no construction would occur that would impact minority and low income populations.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct and Indirect Impacts

There are minority groups and low-income populations in the vicinity of AFRH-W. The minority population within the study area is slightly higher in proportion to the total minority population in the District of Columbia as a whole. Also, the percentage of residents living below the poverty level in Census Tract 23.02, which includes AFRH-W, and Census Tract 32 is slightly higher than DC as a whole, and the percentage of residents living below the poverty level in Census Tracts 23.01 and 24 is slightly lower than the District of Columbia as a whole.

The implementation of AFRH-W Master Plan has the potential to affect the following resources and conditions, and thus impact the residential neighborhoods in the area:

- Land use and zoning – There would be no changes in zoning in the community surrounding AFRH-W. Changes in land use in Zone C would affect the views of persons living in Census Tracts 23.1,32, and to a lesser extent Census Tract 24. These changes may be viewed as long-term, moderate, adverse impacts. The type of development proposed in Zone C would be designed to be compatible with the existing design guidelines for the proposed development. On August 2, 2007, GSA signed an MOU with the DC Office of Planning and NCPC to establish a hybrid approach for controls over the mixed use redevelopment of a portion of AFRH_W. Under the MOU, once the Master Plan is approved by NCPC the DC Zoning Commission will consider that Master Plan. Development covered by the MOU will be the subject of a map amendment case brought by the DC Office of Planning so as to bring that development within the matter of right provisions of the DC Zoning Regulations (11 DCMR).

- Population and housing – New residential development would increase the available housing stock in the area. No adverse impacts on population or housing levels are anticipated.

- Community facilities and services – Impacts to community facilities and services would be moderate as persons living in the vicinity of AFRH-W would have access to new stores and open space within Zone A.

- Economy, employment, and income - Impacts to economy, employment, and income would be minor and beneficial and would have a positive impact on persons living in the vicinity of AFRH-W.

- Transportation - Impacts to transportation would be major. However, these impacts would not disproportionately affect persons living in the vicinity of AFRH-W as the majority of the impacts would be on primary street systems and all users of the roadways would be affected similarly.

- Air quality – There would be a major impact to air quality under the Master Plan Alternatives. However, this impact would be regional and would not disproportionately affect persons living in the vicinity of AFRH-W.

- Noise – The proposed development under the Master Plan Alternatives would generate minor noise increases and therefore would not adversely affect persons living in the vicinity of AFRH-W.

Based on the analysis of impacts above, there would be no disproportionately high or adverse impacts on minority or low-income populations and impacts to these populations would not differ from impacts to the population as a whole. In addition, there would also be direct, long-term, major beneficial impacts to low-income populations through the creation of affordable housing and to homeless veterans as transitional housing would be provided within the AFRH Zone.

Mitigation Measures

AFRH-W is working with the community to develop appropriate design guidelines for the proposed development including development in Zone C and these guidelines will be part of the final Master Plan. Some residents and governmental entities are interested in having all or most of Zone C as public open space. AFRH is willing to entertain offers for that concept if funds are available to compensate it adequately for setting aside land for that purpose and if there is an entity responsible for the costs and maintenance of that open space.

4.2.3 Community Facilities and Services

No Action Alternative

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. As a result, no new construction would occur and there would not be an increased need for community facilities and services.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

Police and Public Safety

The Master Plan Alternatives would increase the number of daytime and evening occupants on AFRH-, which has the potential to result in more calls for service (Grant, 2005). Therefore, a direct, long-term, minor, adverse impact to police and public safety could occur.

Fire Protection

New development would result in a direct, long-term, minor, adverse impact due to an increase in the building density of AFRH-W, which has the potential to result in more fire protection calls. However, there would also be a beneficial impact on fire protection due to the new and

renovated up-to-code buildings, as well as new fire protection devices on site. In addition, the extension of water mains and the addition of new or renovated up-to-code buildings would have a direct positive impact on operability and response for fire protection services at AFRH-W.

Emergency Medical Services

The Master Plan Alternatives would result in additional residents and employees at the AFRH-W. The addition of this population would create a minor additional need for EMS resources and have a direct, long-term, minor, negative impact on the DCFD EMS department.

Hospitals

With the additional daytime and evening persons at AFRH-W, there would be a direct, long-term, negligible, adverse impact on hospital and hospital personnel in the District.

Schools

Development of AFRH-W would create additional demand for schooling. DCPS is expected to have the time and means to prepare for and meet future demands. For the purpose of this EIS, the number of school-age residents in the proposed development has been estimated based on Census 2000 data showing the number of children by age in the immediate area surrounding AFRH-W as well as sample areas of the District of Columbia and its near suburbs comparable in density and nature of residential development to what would be found at AFRH-W after development. On the basis of these data, it is estimated that 12.1 percent of the total resident population at AFRH-W would be less than 18 years of age[29]. Under Alternative 2, approximately 180 new residents would be under 18 years of age; 729 new residents under Alternative 3A; 868 new residents under Alternative 3B; 760 new residents under Alternative 3C; and 902 new residents under Alternative 4. According to the DCPS, the schools within Planning Areas E, F, and H, surrounding AFRH-W have capacity to serve additional students. No significant impacts to DCPS's resources would occur in the project area. A direct, long-term, minor, adverse impact on the school system would occur.

[29] Average of populations ages 0-17 in the census tracts analyzed in the EIS with other census tracts with comparable density to what is being considered at AFRH-W (CT 51 [Downtown, between 15th and 9th, Mass and NY Ave, NW]; CT 57.01[Foggy Bottom, east of 23d Street]; CT 56 [Foggy Bottom, west of 23rd Street]; CT 13.02 [Connecticut NW: Cleveland/Van Ness]; CT 54.01 [Downtown, between NH, Penn, 19th]; CT 5.01 [Kalorama/Woodley Park]; and CT 7048.02 and 7056.02 [Bethesda area, Montgomery County]).

Recreational and Other Community Resources

Existing community services such as libraries, social services organizations, community organizations, and churches would likely benefit from the increase in tax base and local population caused by the development of AFRH-W.

The U.S. Postal Service may need to increase the number of mail carriers designated for the new development depending on the number of cluster boxes on the site (U.S. Postal Service, 2005). The volume of mail generally does not impact the number of postal workers. Impacts to the U.S. Postal Service are expected to be direct, long-term, minor, and adverse.

Under the preferred alternative, Alternative 3A, there will be direct, long-term, major beneficial impacts to the public through the creation of publicly accessible bicycle paths, pedestrian paths, two pocket parks, two large open meadows, and a green buffer around the entire perimeter of Zone A. Within Zone A, for which AFRH has selected a developer, a park of more than 20 acres and smaller open spaces will be created. Centrally located, the large park will serve the new population and existing neighbors. Access to the park will be improved with a new sidewalk on Irving Street.

Indirect and Cumulative Impacts

It is not anticipated that substantial numbers of new employees associated with the development at AFRH-W would relocate to the neighborhoods surrounding AFRH-W. Therefore, no indirect or cumulative impacts are expected on the community facilities in the area.

Mitigation Measures

No mitigation measures are proposed for impacts to community facilities and services.

4.2.4 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 each of the alternatives.

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be developed. As a result, land use and zoning would remain unchanged. Therefore, no direct, indirect or cumulative impacts would occuro

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Regional Land Use and Planning

As described in Section 3.2.4.1 Regional Land Use Planning and Zoning, the Federal and District of Columbia Elements of *The Comprehensive Plan for the National Capital* guide planning and development in the District of Columbia. Compatibility of the Master Plan Alternatives with the Federal and District of Columbia Elements of the Comprehensive Plan is described below.

Federal Elements

- **Federal Environment:** Development on AFRH-W would alter the natural and built environment. The Master Plan Alternatives would result in the use of natural resources as described in Section 4.1 of this EIS. The Alternatives would develop the site in a manner that "provid[es] a setting that benefits the local community, provides a model for the country, and is worthy of the nation's capital."
- **Parks, Open Space, and Natural Features:** The Master Plan Alternatives would have an impact on open space on AFRH-W. However, these alternatives have been developed to conserve open space on the site and promote an appropriate balance between open space resources and the built environment. In addition, under the Master Plan Alternatives studied in the EIS, approximately 182 to 188 acres or 67 to 70 percent of AFRH-W would remain in open space.
- **Preservation and Historic Features:** The Master Plan Alternatives would impact historic features including the historic landscape as described in Section 4.3 of this EIS.

These impacts would be mitigated through a Programmatic Agreement with the DC SHPO, National Park Service and ACHP.

District of Columbia Elements

- **Economic Design Element:** As described in Section 2.1 of this EIS, the Master Plan Alternatives would include retail and commercial development providing additional jobs compatible with this element of the Comprehensive Plan. In addition, construction jobs would continue for over 10 years.
- **Urban Design Element:** The implementation of any of the Master Plan Alternatives would ensure that development on AFRH-W would "complement the natural environment, provide visual orientation, enhance the District's aesthetic qualities, emphasize neighborhood identities, and be functionally efficient." Design guidelines are being developed as part of the final Master Plan.
- **Preservation and Historic Features Elements:** The Master Plan Alternatives would impact historic features as described in Section 4.3 of this EIS. These impacts would be mitigated through a Programmatic Agreement with the DC HPO, NPS and ACHP.

Project Area Land Use and Zoning

Implementation of any of the Master Plan Alternatives would expand the mix of uses on the site. Development on the site, if done by the Federal government, is not subject to zoning.

Under Alternative 2, the land uses would be expanded from primarily open space and Federal institutional/residential use to Residential, Institutional, Hotel/Conference Center, Research and Development, Retail, and Medical. the AFRH Zone would be developed with moderate in-fill development for institutional uses compatible with AFRH-W operations. the AFRH Zone would be developed with new residential units for AFRH-W use, lease, or sale. This development would replace open and forested space. Zone A would be developed with educational, research and development, office, retail, and hotel uses. This development would replace AFRH facilities located along North Capital Street. Open space would be replaced with medical uses compatible with the Washington Hospital Center Development south of Irving Street. Within Zone B, open space would also be replaced with medical uses compatible with the Washington Hospital Center Development south of Irving Street. Within Zone C, open space would be replaced with residential development compatible with the residential development west of Rock Creek Church

Road. This zone would also potentially include retail development to serve the residential areas, publicly available open space and reuse of all historic buildings.

Through Alternative 3A/3B/3C, the land uses would be expanded from primarily open space and Federal institutional/residential uses to Residential, Institutional, Hotel/Conference Center, Retail, Medical, and Office/Research and Development. Development in the AFRH Zone would be the same as described for Alternative 2. Zone A would be developed with residential, office, retail, and hotel uses. This development would replace AFRH facilities located along North Capital Street. In addition, open space would be replaced with office buildings, commercial buildings, and residential areas compatible with surrounding development. Within Zone B, open space would be replaced with residential development. Under Alternative 3A, open space within Zone C would be replaced with institutional and residential development.

Through Alternative 4, the land uses would be expanded from primarily open space of Federal institutional/residential use to Residential, Institutional, Retail, and Office. Development in the AFRH Zone would be the same as described for Alternative 2. Zones A and B would be developed with residential, office, and retail uses. This development would replace AFRH facilities located along North Capital Street and open space along Irving Street. Within Zone C, open space would be replaced with residential development.

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

AFRH-W is zoned GOV, Government and therefore is not subject to local zoning regulations unless portions of the site are sold to private parties. Implementation of the Master Plan would result in a considerable change to zoning on the site if segments of AFRH-W are sold. As noted above, there is a MOU among AFRH, DC Office of Planning and NCPC whereby the DC Zoning Commission will consider the AFRH Master Plan. Development covered by the MOU will be the subject of a map amendment case to be brought by the DC Office of Planning so as to bring that development within the matter of right provisions of the DC Zoning Regulations.

If the property is rezoned due to a sale, an application would be made to the DC Zoning Commission for an amendment to the District of Columbia's zoning map. A map amendment is required because the land is currently zoned GOV-Government. Typically, the Commission

looks at the zoning designations of surrounding properties in deciding the conformance of a map amendment. An application for a PUD would also be completed. A PUD is an overlay district that permits flexibility of development. The DC Zoning Commission can approve height and bulk requirements more or less stringent than those in the underlying zone.

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

At the local level, the DC Office of Planning, Development Review Division, is responsible for reviewing the development plan, and the DC Zoning Commission prepares, adopts, and amends the zoning regulations and zoning maps. The final approval authority at the local authority rests with the DC Zoning Commission if any segments of the site are sold. On Aug 2, 2007, GSA signed a Memorandum of Understanding (MOU) with the DC Office of Planning and NCPC to establish a hybrid approach for controls over the mixed use redevelopment of parts of the campus that would be developed by other Federal entities. Under the MOU, once the Master Plan is approved by NCPC, the DC Zoning Commission will consider that Master Plan. Development covered by the MOU will be the subject of a map amendment case brought by the DC Office of Planning so as to bring that development within the matter of right provisions of the DC Zoning Regulations (11 DCMR).

Indirect Impacts

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.

Cumulative Impacts

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, including development in the Georgia Avenue – Petworth area along with development of the McMillan Reservoir and the Washington Hospital Center would likely be consistent with current land use and zoning designations in the area.

Mitigation Measures

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

4.2.5 Economy, Employment, and Income

This section analyzes the potential for impacts to the economy and employment for the No Action Alternative and each of the alternatives.

No Action Alternative

Direct Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. A direct, long-term, major, adverse economic impact to AFRH-W would occur because sufficient funding would not be generated to support AFRH-W for future generations.

Indirect Impacts

As a result of insufficient funding, AFRH would be forced to close and the number of employees would be reduced, services offered to residents of AFRH-W would be reduced, and capital improvements for new services or to repair aging buildings would not be feasible. Therefore, indirect, long-term, major, adverse impacts to economy and employment would occur.

Cumulative Impacts

No cumulative impacts are expected under the No Action Alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

With the implementation of the Master Plan for AFRH-W, regional economic activity would increase as construction firms are hired for the project. The purchase of building materials, construction supplies and construction equipment, as well as spending by the construction workers, would add income to the economy. Direct impacts to employment may also occur from jobs related to construction on-site. Therefore, construction would have a direct, short-term, moderate, beneficial impact on employment and the economy.

In addition, moderate, long-term, beneficial, direct impacts would occur from increases in employment on AFRH-W property associated with the planned office, research and

development, institutional, retail, hotel, and medical uses under each of the Master Plan Alternatives. Table 4-8 provides a summary of potential increases in employment for each of the Master Plan Alternatives. This estimate is based on the following factors: 0.7 employees per 1,000 square feet for institutional and hotel/conference center; 2.5 employees per 1,000 square feet for retail; and 3.0 employees per 1,000 square feet for office/research and development, and medical.

Table 4-8: Potential Increase in Employment

Number of Employees/ 1,000 sq. ft. (ULI, 1994)	Institutional 0.7	Hotel/ Conference Center 0.7	Office/ Research & Development 3	Retail 2.5	Medical 3	Total
Alternative 2	1,785	140	9,600	325	4,800	**16,678**
Alternative 3A	245	86	4,151	609	723	**5,814**
Alternative 3B	245	154	2,076	604	750	**3,585**
Alternative 3C	245	140	2,100	1,177	0	**6,383**
Alternative 4	273	0	0	750	0	**3,123**

Under the preferred alternative, Alternative 3A, a developer has been selected for development of Zone A. The developer is committed to a policy of equal opportunity and non-discrimination in all of its procurement activities in accordance with public laws including:

- Public Law 95-507 (October 24, 1978) Amendment to the Small Business Investment Act of 1958 and the Small Business Act of 1958
- Public Law 99-661, Section 1207, 1987 National Defense Authorization Act
- Public Law 100-180, Section 806, 1987
- Public Law 103-355 (October 13, 1994) Federal Acquisition Streamlining Act, Title VI – Small Business and Socioeconomic Laws
- Public Law 105-135 (December 2, 1997) Small Business Reauthorization Act of 1997
- Public Law 106-50 (August 17, 1999) To provide technical, financial, and procurement assistance to veteran owned small businesses, and for other purposes.

In support of that commitment, the developer would engage in affirmative action in the conduct of purchasing and contracting practices so as to provide business opportunities for small, small disadvantaged, women-owned small, HUBzone, veteran-owned small and service disabled

veteran-owned small businesses. This plan would be included in all contracts with subcontractors, professional service providers, and suppliers of goods and services for the project, and each would be expected to exert reasonable good faith efforts to implement and abide by the terms of the plan and to impose the same commitment upon their subcontractors and vendors. Prior to the dissemination of policy and implementation of the plan, the requirements may be modified or amended to include other requirements contractually assigned or determined by the developer to be necessary in furtherance of the goals of this plan.

This plan would be communicated internally through workshops, seminars, and at project staff meetings, and externally through conferences, trade fairs, news media and company publications to subcontractors, vendors and suppliers, and small, minority, women-owned and veteran-owned business trade associations and advocacy groups.

In addition, the developer of Zone A would promote the growth of skilled craft labor by supporting the use of registered apprenticeship programs. The term "registered apprenticeship program" is a program that is registered with the United States Department of Labor or State Apprenticeship Council under 29 CFR Part 29 and/or the District of Columbia Apprenticeship Council.)

Indirect Impacts

Daily spending by new employees on-site would positively affect the area. These expenditures commonly include gasoline, automobile servicing, food and beverages, laundry, and other retail purchases undertaken in the immediate area because of convenience and access during the course of the business day. Therefore, an indirect, short-term, moderate, beneficial impact would occur.

Cumulative Impacts

Past, present, and future development in the vicinity of AFRH-W would result in a moderate, long-term, beneficial, cumulative impact on the economy, employment, and revenues of the region. Development in the Georgia Avenue – Petworth Area along with development of the McMillan Reservoir and the Washington Hospital Center would result in additional beneficial impacts to the area's economy and employment conditions. These impacts would cumulatively add to the beneficial impacts of AFRH-W development.

Mitigation Measures

No mitigation measures for impacts to economy, employment or income are proposed under the Master Plan Alternatives.

4.2.6 Taxes and Revenue

This section analyzes impacts to real property taxes, personal property taxes, corporate franchise and unincorporated franchise taxes, sales and use taxes, individual income taxes, miscellaneous revenues, and intergovernmental revenues for each of the alternatives studied in detail. These impacts are identified for the District of Columbia and the District of Columbia-Maryland-Virginia region. These impacts are estimated for one-time expenditures (initial construction) and for on-going operations and maintenance of the property.

This analysis compares the public revenues and public costs associated with development of AFRH-W. The fiscal impact analyses for the alternative AFRH-W scenarios take into account the key District of Columbia tax revenues associated with each particular alternative.

No Action Alternative

Under the No Action Alternative, the proposed development under the Master Plan at AFRH-W would not take place. Because AFRH-W facility is federally owned and exempt from taxes, revenues from AFRH Trust Fund would continue to be depleted to fund operations and improvements at AFRH-W. This would result in a direct, long-term, major, adverse effect on AFRH revenues and the sustainability of AFRH-W.

There would be no indirect or cumulative impacts to taxes and revenues under the No Action Alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

Implementation of any of the Master Plan Alternatives would result in new revenues to replenish AFRH Trust Fund. Revenues generated through the sale or lease of land on AFRH-W would result in a direct, long-term, major, beneficial impact on the Trust Fund revenues.

As a Federal government agency, AFRH would not directly contribute property tax revenues to the District of Columbia. DC Code Section 47-1005.01, which provides for the assessment and taxation of leasehold interests, possessory interests, beneficial interest, or beneficial use in property that is owned by the Federal government but occupied by a person using the property for a non-tax-exempt purpose, may be levied upon a private developer holding a ground-lease interest granted by AFRH for a non-tax-exempt use. As a result, the District of Columbia may

be able to receive new revenues from taxes assessed based on the value of improvements on the real property if a lease, and on the land and improvements if a sale. Taxes would be in accordance with the tax status of the lessee or user.

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

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

Indirect Impacts

With any of the alternatives, future build-outs consist of residential housing, hotel/conference center, research and development, retail, office space, medical, embassies, and institutional. Secondary jobs related to the increased economic activity of the project may be created. The additional retail and business employment would result from any of the alternatives, yielding additional sales and income tax revenues for the District of Columbia. New retail services and business employment may result from implementing any of the alternatives with the creation of new businesses to serve the additional employees. Increases in revenues and taxes may also occur from contractual obligations with vendors to support any of the proposed operations. Furthermore, the increase in residential housing would also contribute to additional revenues and taxes to the District of Columbia from residents using retail services. All this would create a moderate, indirect, long-term, beneficial impact.

Mitigation Measures

No mitigation measures for impacts to taxes and revenues are proposed under the Master Plan Alternatives.

4.3 Cultural Resources

4.3.1 Archeological Resources

No Action Alternative

Under the No Action Alternative, no new development would occur on AFRH-W and there would be no impacts to archeological resources.

Proposed Action

Direct Impacts

Development under the Master Plan Alternatives could result in direct, long-term, minor, adverse impacts. The potential impacts and impacted areas are defined by zone in Table 4-9.

Table 4-9: Archeological Potential per Development Zone

	Archeological Potential
the AFRH Zone	Each zone has an area with moderate archeological sensitivity for prehistoric occupation due to the presence of level, well-drained soils and proximity to a potable water source.
Zone A	Zone A has the largest acreage of the six zones in the project area, and it also impacts the greatest number of potential archeological resources. The majority of these resources are historical, only a small portion of the acreage in Zone A has moderate potential for prehistoric resources. Four areas with potential for historic archeological resources would be affected by development of Zone A: • Site of a Post-1873 cross gable frame building; • Site of the Corlis Cottage; • Site of the Former Barnes building, circa 1876; and • Site of a possible late 19th century building. Small area of moderate archeological sensitivity for prehistoric occupation due to the presence of level, well-drained soils and proximity to a potable water source.
Zone B	Two small areas of moderate archeological sensitivity for prehistoric occupation due to the presence of level, well-drained soils and proximity to a potable water source.
Zone C	Entire area has moderate archeological sensitivity for prehistoric occupation due to the presence of level, well-drained soils and proximity to a potable water source.

Indirect and Cumulative Impacts

No indirect or cumulative impacts to archeological resources are anticipated.

Mitigation Measures

As part of the process for compliance with Section 106 of the National Historic Preservation Act (NHPA), a work plan for a Phase I Archeological Subsurface Investigation of the four zones would be prepared. The Phase I survey would be designed to identify any archeological resources with the potential to be determined NRHP eligible. If any potentially eligible archeological sites are identified, a Phase II archeological study of each site would be required to determine eligibility. If any archeological sites are determined to be eligible to the National Register, AFRH will consider avoidance or mitigation measures in consultation with the District of Columbia Historic Preservation Office (DC HPO) and other interested parties.

Consultation with the DC HPO would be conducted prior to conducting any archeological investigations as outlined in Chapter 6 of AFRH Historic Preservation Plan, AFRH Historic Preservation Standard Operating Procedure Number 12. The following steps would be followed:

- AFRH will notify the DC HPO
- AFRH and DC HPO will enter into consultation
- AFRH will select an archeologist
- AFRH sill submit a permit application (if necessary)
- Consultation for identification, evaluation, and treatment would occur
- DC HPO will review work plan
- AFRH will implement work plan
- AFRH will determine eligibility
- AFRH develops and submits treatment plans
- Review and implementation of treatment plan
- AFRH submits final report

- AFRH arranges for curation of artifacts and associated records

4.3.2 Historic Properties

No Action Alternative

Under the No Action Alternative, no new development would occur on AFRH-W and there would be no impacts to the historic landscape. Because of budgetary constraints under the No Action Alternative, historic built resources that are currently underutilized may deteriorate over time resulting in indirect, long-term, moderate, adverse impact on historic resources.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct and Indirect Impacts

All of the Master Plan Alternatives have the potential to directly and indirectly affect historic resources. Figure 4-1, Development Zones and Character Areas, shows the proposed development zones overlaid on the site's character areas.

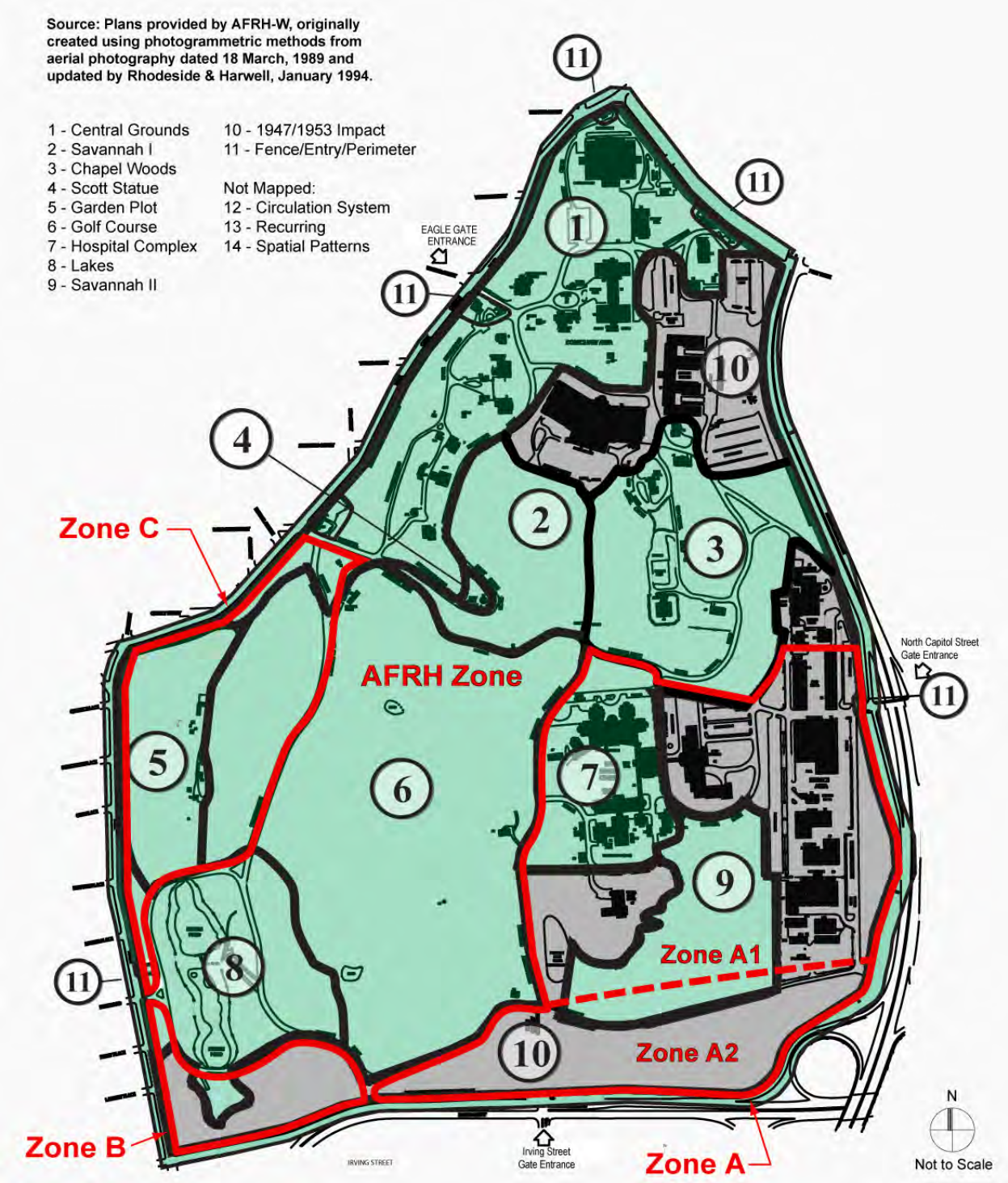


Figure 4-1: Development Zones and Character Areas

President Lincoln and Soldiers' Home National Monument (NM). No contributing features of the President Lincoln and Soldiers' Home National Monument would be demolished or physically altered under the Master Plan Alternatives. Therefore, there would be no direct impacts to this resource.

The National Monument could be indirectly affected by new construction in the AFRH Zone. Under all of the build alternatives, new construction in the AFRH Zone would be between four and 6 stories in height. New construction (up to 55 feet in height) on the existing Grant parking lot could result in a change to the existing setting. As the land adjoining the National Monument has experienced development since the initial years of AFRH-W, new construction is consistent with AFRH-W's history. However, depending on its location, density, height, scale, mass, and architectural articulation, the character of new construction could change the setting and views of the National Monument resulting in indirect, long-term, moderate, adverse impacts. Given that, the preferred alternative locates most of the new construction in the AFRH Zone to the easternmost side of the zone, away from the National Monument and in most cases, behind existing buildings. Construction of a building on the site of the demolished Sheridan Building would be of a scale and in keeping with the character of that building; its construction would recreate the quadrangle located near the National Monument area.

U.S. Soldiers' and Airmen's Home National Historic Landmark (NHL) and National Register Listed Historic District. No contributing features of the U.S. Soldiers' and Airmen's Home National Historic Landmark (NHL) and Historic District (NR-Listed) and would be demolished or physically altered under the Master Plan Alternatives. Therefore, there would be no direct impacts to this resource.

The NHL and Historic District could be indirectly affected by new construction in the AFRH Zone. Through the Master Plan and its guidelines for the preferred alternative, the NHL and Historic District would be protected from adverse impacts because development is not located within or close to the resources.

AFRH-W Historic District (NR-Eligible). All the character areas of AFRH-W Historic District could be directly affected by the Master Plan Alternatives. The 272 intact acres of AFRH-W, part of AFRH-W since 1873, would potentially be affected by the construction of new buildings and would be reduced in size by the private development of some areas of AFRH-W. Some cultural landscape features such as roads, paths, tree lines, and streams could be disrupted or lost entirely. New construction could potentially alter the historic context of individual buildings and building groups, and may obscure the relationship between buildings and the landscape. For

these reasons, the proposed undertaking would potentially have direct, long-term, major, adverse impacts on AFRH-W Historic District. The preferred alternative was designed to minimize these impacts through the Master Plan preferred for this site and its design guidelines which control critical elements such as height, massing, view protection, landscape and historic structures. Measures described herein are intended to mitigate remaining impacts.

Character Area 1: Central Grounds. This character area would be most affected by new construction in the AFRH Zone and Zone C. New construction in this character area could result in a loss of continuity among buildings, green space, and the overall campus-like feel of the Central Grounds. New construction could also obscure the historic views of the Capitol and city from this Character Area. Through the Master Plan and its guidelines for the preferred alternative, the Central Grounds are protected from adverse impacts because development is not located on or close to the Central Grounds and a substantial buffer area is required to be left undeveloped on the northern portion of Zone C.

Character Area 2: Savannah I. This character area would be most affected by new construction in the AFRH Zone and Zone A, which could create significant visual intrusions upon this historic landscape feature. The Master Plan and its guidelines for the preferred alternative set height limits and parcels in such a way to avoid or minimize impacts on the views from this Character Area and landscape guidelines will protect its natural character. The relocated golf course holes might have been located in this area but will instead be relocated within the existing footprint of the course. Development in zone would be located far from Savannah I generally and development that would be allowed in the adjacent Chapel Woods would be screened by forests which will remain untouched.

Character Area 3: Chapel Woods. This character area would be most affected by new construction in the AFRH Zone and Zone A. Historically, the Chapel Woods was a forested hillock with Rose Chapel (Building 42) at the center. New construction in this character area could result in the loss of the sense of the hillock, and the chapel amid a forest. One non-contributing resource, Building 43 (Auto Craft Shop), in this character area may be demolished under the Master Plan Alternatives resulting in a long-term, direct, moderate, beneficial impact to the Chapel Woods. Development allowed in this zone under the Master Plan will be very low scale residential and located on an existing paved are in the center of the Character Area. The forested areas will remain undeveloped.

Character Area 4: Scott Statue. The Scott Statue would be most affected by construction in the AFRH Zone. Dense construction to the south of this resource could adversely impact the view of the dome of the U.S. Capitol to the south. The planning process involved numerous view studies, including sketches and elevations, on-site balloon tests and use of a crane to check the visibility of potential building heights on views from the Scott Statue. As a result, the Master Plan height and parcel guidelines avoid or minimize view impacts, and the mitigation will further minimize those potential impacts.

Character Area 5: Garden Plot. The Garden Plot is located within Zone C. Development of Zone C would result in the destruction of this supporting resource to AFRH-W Historic District and would thus have an adverse impact on AFRH-W Historic District. Low scale development in zone under the preferred alternative and constructed in accordance with the Master Plan will minimize the impacts but they will not be completely avoided. The historic use will be relocated to the AFRH Zone.

Character Area 6: Golf Course. The Golf Course is located within the development area of the AFRH Zone and would be most affected by construction in the AFRH Zone. Although this would create an adverse impact, the relative historical significance of this area is minor due to changes in the 1950s which compromised the integrity of this character area.

Character Area 7: Hospital Complex. The Hospital Complex would be most affected by construction in the AFRH Zone and Zone A. Dense construction to the south of the complex, in particular, would adversely affect the appearance of the Hospital Complex, situated on high ground with views of open meadow to the west, south, and east. Under the preferred alternative and the Master Plan, all of the contributing buildings will be rehabilitated and adaptively used and the neighboring Pasture Character Area will remain largely intact, buffering this Character Area from development to the south. A buffer of existing tress will remain to the southeast, setting off the Character Area from development on its eastern edge.

Character Area 8: Lakes. The Lakes would be most affected by new construction in Zones B and C. As proposed, the new construction would completely surround the Lakes on the north and south, substantially diminishing the historical pastoral and park-like feeling and setting of the Lakes. New construction along Park Place may also result in the loss of the historic fence along the road. Under the preferred alternative and the Master Plan, the historic fence will be restored but openings allowed for pedestrians.

Upper stories of new construction are required to be setback to minimize the impacts on the Lakes.

Character Area 9: Savannah II. This character area, centrally located in Zone A, would be most affected by new construction in Zone A. This character area has been intact open space since the founding of AFRH. New construction in this zone would result in the loss of this resource. Under the preferred alternative and Maser Plan, much of Savannah II will remain, and natural and original topographic features will be restored, such as the currently buried stream.

Character Area 10: 1947/1953. This character area does not contribute to the historic district and impacts to this area would thus not be considered adverse to historic resources.

Character Area 11: Fence/Entry/Perimeter. This character area is a character-defining feature of the historic district. It would be affected by new construction in all Zones. Under the Master Plan, guidelines direct the restoration of the fence. However, pedestrian entries will be allowed at a few locations near Park View for access to the site by neighbors.

Character Area 12: Circulation System. The Circulation System is a supporting resource to the historic district and will be adversely affected by new construction in all zones as transportation needs and patterns will be altered. The Maser Plan includes guidelines for street types and requires that the character of certain historic sections of the system remain in place to mitigate those impacts. Materials for new streets are required to be the same as or similar to those used historically.

Character Area 13: Recurring Resources. This character area includes those secondary structures and objects throughout AFRH and are not considered significant contributing resources to the historic district. Although affected by construction in all Zones, the overall impact to the historic district would be negligible.

Character Area 14: Spatial Patterns. The Spatial Patterns will be affected by development in all Zones. New construction will alter existing historic relationships between buildings, open space, and other resources, adversely impacting several aspects of historical integrity of the historic district including setting, feeling, and association. Under preferred alternative and the Master Plan some of these impacts will be mitigated by the preservation of large areas of open space.

Adams Memorial (NR-Listed). The proposed undertaking would not directly or indirectly impact the Adams Memorial. The proposed new construction would be minimally, if at all, visible from the Adams Memorial due to the topography of the Rock Creek Church Cemetery, in which the memorial is located. Furthermore, the Adams Memorial is located far enough away from AFRH-W site that the proposed new construction would not significantly impact the setting of the memorial.

Rock Creek Church Yard and Cemetery (NR-Listed). Characterized by rolling topography, scattered plantings, and low-scale gravestones and mausoleums in a natural setting, this National Register-Listed property may be affected by new construction in the AFRH Zone, particularly along Rock Creek Church Road and Harewood Road. New construction in the AFRH Zone would be between four and six stories in height. However, depending on its location, density, height, scale, mass, and architectural articulation, the character of new construction could change the setting and views of this resource resulting in indirect, long-term, adverse impacts. Under the preferred alternative and Master Plan, development in the AFRH Zone would be located primarily to the east and away from the Church Yard and Cemetery to minimize potential impacts.

Saint Paul's Episcopal Church (Rock Creek Church) (NR-Listed). The National Register property may be affected by new construction in the AFRH Zone. However, the church is within the Rock Creek Church Yard and Cemetery at a distance sufficient to effectively mitigate the impact of the new construction on the property. Therefore, it is unlikely that the proposed action would impact this resource.

Harewood Gate Lodge and East Ground (NR-Eligible). Characterized by rolling topography and a largely untended natural landscape, this resource would be affected by new construction in Zones B and C. New construction in Zone B would be stepped up from three to six to eight stories moving from east to west and in Zone C would be no more than three to four stories in height. New construction of the proposed height and density could have an adverse effect on the property by altering its setting and further obscuring the already tenuous physical and visual relationship between AFRH-W site and the Harewood Gate Lodge and East Grounds. However, because North Capitol Street already forms a barrier between AFRH-W and the Harewood Gate Lodge and East Ground and because development under the Master Plan Alternatives would be setback from North Capitol Street, the direct, long-term, adverse impact of this development on the Harewood Gate Lodge and East Ground would be minor.

Petworth (NR-Eligible). The National Register-eligible Petworth Historic District would be affected by the proposed new construction in the AFRH Zone and Zone C. New construction in the AFRH Zone would be between four and six stories in height. New construction in Zone C would be no more then three to four stories in height. When Petworth was originally developed in the late 19th and early 20th centuries, AFRH-W was used as a park, and opened to the public. Although AFRH-W has not been accessible to the public since 1925, the introduction of new construction in Zone C would change this traditional relationship, separating the historic residential neighborhood from the natural landscape of AFRH-W. Therefore, the proposed action would have an indirect, long-term, moderate, adverse effect on the National Register-eligible Historic District. Under the preferred alternative and the Master Plan, there is no new construction proposed in the AFRH Zone that would impact this relationship. Under the preferred alternative and Master Plan, in Zone C, low scale residential is proposed along with park land which could make the site once again accessible to the public. Parkland in Zone A will also be open to the public.

Park View (NR-Eligible). The National Register-eligible Park View Historic District would be affected by the proposed new construction in Zones A through C. New construction in Zone C would be no more then three to four stories height with residential and retail uses. New construction in Zone A and B would be between four and six stories in height. When Park View was originally developed in the late-19th and early 20th centuries, AFRH-W AFRH-W was used as a park, and opened to the public. AFRH-W was likely the park referenced in the name "Park View." Although AFRH-W has not been accessible to the public since 1925, the introduction of new construction in Zones B and C would permanently change this traditional relationship, separating the historic residential neighborhood from the natural landscape of AFRH-W. Therefore, the proposed action would have an indirect, long-term, moderate, adverse effect on the National Register-eligible Historic District. Under the preferred alternative and the Master Plan, there is no new construction proposed in the AFRH Zone that would impact this relationship. Under the preferred alternative and Master Plan, in Zone C, low scale residential is proposed along with park land which could make the site once again accessible to the public, a buffer along Zone C and open and wooded land on the northern and southern portions of the zone will remain, minimizing the impacts. Park land in Zone A will also be open to the public.

United States Soldiers' and Airmen's Home National Cemetery (NR-Eligible). Characterized by rolling topography, scattered plantings, and low-scale gravestones in a natural setting, this National Register property would be affected by new construction in the AFRH Zone. Proposed new construction in the AFRH Zone would be between four and six stories in height. New

construction in the AFRH Zone, particularly along Harewood Road and in the east portion of the AFRH Zone, would have the greatest impact on the National Register property. Depending upon the location, density, height, scale, mass and architectural articulation of new construction in these sensitive areas, the proposed new construction could have an adverse effect on the National Register property. Under the preferred alternative and Master Plan, development in the AFRH Zone would be located primarily to the east and away from the Church Yard and Cemetery to minimize potential impacts.

Cumulative Impacts

The multiple impacts of the proposed Master Plan Alternatives on historic resources would result in long-term, adverse, cumulative impacts. Past projects in the vicinity of AFRH-W, such as the widening of North Capitol Street have adversely affected historic resources. The McMillan Reservoir is eligible for listing on the National Register of Historic Places and is listed on the DC Inventory of Historic Sites. Future development of the Reservoir would alter and thus impact this historic resource. When added to other past and reasonably foreseeable future actions that have altered historic properties on and in the vicinity of AFRH-W, the proposed Master Plan Alternatives would contribute to long-term, major, adverse, cumulative impacts. It will also have positive impacts under the Master Plan and preferred alternative. Most significantly, all historic structures are slated to remain and rehabilitation and adaptive use of them is encouraged or required. Additional revenues to AFRH form development will allow AFRH to be a better steward of its historic and cultural resources.

Mitigation Measures

AFRH has initiated consultation through the Section 106 process with the DCHPO and the ACHP. As a result of this consultation, a programmatic agreement is being developed that identifies mitigation measures to be implemented as well as preservation design guidelines for the defined character areas in AFRH-W. These design guidelines have been incorporated into the final AFRH-W Master Plan. Recommended possible mitigation measures include the following:

Specific Actions to be Undertaken by AFRH

1) AFRH will retain the services of a Cultural Resources Manager (CRM) to assist AFRH in the implementation of the 2007 Historic Preservation Plan (HPP). The CRM will be retained within 12 months of NCPC's approval of AFRH-W Master Plan.

2) AFRH will plant additional trees to replace those required for the relocation of two golf holes due to the Zone A development. Trees will be replaced on a 1-to-1 basis in accordance with AFRH Treatment Recommendations for Landscape Resources in Chapter 6 of the 2007 HPP at the time the golf holes are relocated.

3) AFRH will develop and implement a Historic Preservation Maintenance Program (HPMP) designed to identify and prioritize the maintenance needs of the contributing historic (built, natural and designed landscape, and archeological) resources. This plan will be developed and implemented within 2 years of NCPC's approval of AFRH-W Master Plan.

4) AFRH will integrate AFRH-W Resource Inventory/Cultural Resource Management Database into AFRH-W's proposed Computerized Maintenance Management System (CMMS) at the time the new CMMS is brought online. It is anticipated that this system will be brought on line within 2 years.

5) AFRH will develop a landscape Master Plan for the AFRH Zone and Zones B and C of the campus. This plan would be developed within one 1 year of the approval of AFRH-W Master Plan. Implementation of the landscape Master Plan will begin within one 1 year of commencement of rent payments from the Zone A development.

6) AFRH will complete an update to an August 2007 tree survey to include Zones B and C within 1 year of commencement of rent payments from the Zone A development.

7) AFRH will complete specific landscape projects as follows:

a. Scott/Sheridan Promenade Project within 3 years from AFRH MP approval,

b. Scott Building Tree Planting Program will be completed as part of the landscape Master Plan developed in item #5 above

8) AFRH will perform a condition assessment of the historic fence along the western perimeter of the site, and perform stabilization activities. The assessment will be conducted within 2 years of AFRH-W Master Plan approval.

Specific Actions to be Undertaken for Zone A

1) The developer for Zone A will rehabilitate and adaptively use, in conformance with the Secretary of Interior's Standards for Rehabilitation (36 C.F.R. 67) and its associated Guidelines the following buildings in Zone A:

a. Barnes Building (Building 52)

b. Forwood Building (Building 55)

c. King Hall (Building 59)

d. Viewing Stand (Building 50)

e. Bandstand (Building 49)

f. Mess Hall (Building 57)

g. Mess Hall Corridor (Building 58)

h. Hostess House (Building 53)

i. Quarters 47 (Building 47)

The developer will develop a stabilization and maintenance plan of the buildings and structures listed above no later than 120 days after the effective date of the Master Lease for Zone A. Rehabilitation for these buildings and structures listed above will commence in accordance with the Project Schedule submitted as part of the Project Plan for the first non-infrastructure phase of development.

2) The developer will rehabilitate historic landscape resources in Zone A:

a. Forwood Building Grounds to the extent grounds are located in Zone A and controlled by developer. (LaGarde and secured grounds remaining within the AFRH Zone are excluded until such time LaGarde is leased to the developer);

b. Pershing Drive Street Trees, south and east: Developer will preserve the historic orientation of Pershing Drive and shall preserve, to the maximum extent possible, the allee of trees bordering Pershing Drive. If it is not possible to save all the trees, the developer will replant trees of the same species, or, if not available, a similar species that resembles the vegetation, with the intent of restoring the historic allee.

c. Hospital Complex Quadrangle to the extent grounds are located in Zone A and controlled by developer. (LaGarde and secured grounds remaining within the AFRH Zone are excluded until such time LaGarde is leased to the developer);

d. Specimen Trees in Hospital Lawn. If it is not possible to save all trees, the developer will replant trees of the same species, or, if not available, a similar species that resembles the vegetation in an agreed upon location within the Hospital lawn; and

e. Pasture Recreation: The developer will preserve to the maximum extent possible the orientation, unaltered topography, and configuration of the Historic Pasture in Zone A. Also, historic trees in the northwest section of the pasture will be preserved to the maximum extent possible. If it is not possible to save all trees, the developer will replant trees of the same species, or, if not available, a similar species that resembles the vegetation, in an agreed upon location within the Historic Pasture.

3) The developer will devise and implement an educational interpretation program including signage focusing on the history of AFRH and AFRH-W.

4) The Developer will complete a tree-planting program and the maintenance of historic trees in accordance with the approved AFRH Master Plan and local DC law.

Specific Actions to be Undertaken for Zone B

As a condition of development for Zone B, the selected developer will be required to complete the following specific mitigations:

1) Restoration of historic iron fence along the western perimeter of Zone B.

Specific Actions to be Undertaken for Zone C

As a condition of development for Zone C, the selected developer will be required to complete the following specific mitigations:

1) Restoration of the historic iron and masonry and iron fences along the western perimeter of Zone C.

2) Relocation of Community Gardens from Zone C to the AFRH Zone.

3) Undertake specific landscaping to screen Quarters 90 (Randolph Street Gatehouse, Building 90) from the northernmost development on Zone C.

4.4 Transportation

No Action Alternative

The No Action Alternative includes future anticipated peak hour traffic volumes for roadways near the site. These volumes are the sum of the existing traffic volumes, plus the background growth in the area and the approved, un-built developments in the study area. Under this scenario, new development would not occur on AFRH-W property. Traffic study intersections are shown on Figure 4-2.

The area surrounding AFRH-W is fairly well built-out. In addition, the Washington Hospital Center (WHC) and the Children's National Medical Center (CNMC) have been approved for expansion. Projected traffic from the CNMC was assigned to roadway network. However, the WHC has been approved for growth from approximately 5,600 employees today to a projected employee total of 7,700 in the year 2015. In conjunction with this expansion, changes to parking and access around the hospital are anticipated to significantly affect the assignment of trips in the immediate vicinity of the hospital center, particularly along Irving Street. Information from the MedStar/Washington Hospital Center Rezoning Application (O.R. George & Associates, 2000) was used to subtract existing WHC traffic from the network and then add back 2015 traffic for the built-out WHC with the altered trip assignment.

Traffic data for assessing recent trends in traffic growth in the study area were only available through 2002 from DDOT, and show generally zero to negative traffic growth in the area. The Traffic Impact Analysis for the CNMC (O.R. George, 2006) indicates that traffic along Michigan Avenue south of the hospital increased at an average rate of 3 percent annually between 2000 and 2006. However, there was no indication that such a growth rate would apply to Irving Street, North Capitol Street, or other roadways in AFRH-W study area. Furthermore, the 3 percent rate was only applied in the CNMC report for traffic growth between 2006 and 2007. It is assumed that a 3 percent growth rate, if present in AFRH-W study area, would be sustained all the way to the 2020 projected build-out year for AFRH-W.

Consequently, the traffic volumes in the study area intersections were projected to Year 2020 using a 1 percent annual growth rate, which is a conservative rate for this area. Levels of Service were calculated at these intersections using Synchro and HCM methodology. Signal timings at all intersections were optimized using Synchro.

The intersection of North Capitol Street at Michigan Avenue is expected to operate at level of service F during both the AM and PM peak hours. The intersections of Irving Street/1st Street

and North Capitol Street/Fort Drive are expected to operate at acceptable LOS during the AM peak; however, they are expected to operate at LOS E during the PM peak hour. All other intersections are expected to operate at LOS D or better during both the AM and PM peak hours. Figures 4-3a and 4-3b present the LOS results which are summarized below in Table 4-10.

At North Capitol Street at Michigan Avenue, left turns were previously prohibited from eastbound Michigan Avenue onto northbound North Capitol Street. Changes have been made in recent years to allow this movement, but it does not appear that the WHC study anticipated this change, which improves access but degrades intersection level of service. It was investigated whether reinstituting this left turn restriction would produce an adequate level of service for the design year. However, the assumed background growth between WHC completion in 2015 and AFRH-W build out in 2020 would still result in LOS F during the PM peak hour.

Geometric improvements at several intersections would allow them to operate at LOS D. **It should be noted that these improvements are needed under the No Action Alternative and are not a result of the proposed action. Therefore AFRH does not propose undertaking these improvements as part of the Master Plan Alternatives studied in the EIS.**

North Capitol Street/Michigan Street

- Construct dedicated right turn lanes on all approaches and construct an additional westbound left turn lane on the westbound Michigan Avenue approach.

Irving Street/1st Street NW

- On the northbound approach, provide one shared left and right turn lane, and two exclusive right turn lanes.

North Capitol Street/Fort Drive

- On the westbound approach, provide one shared left and right turn lane, and one exclusive right turn lanes.

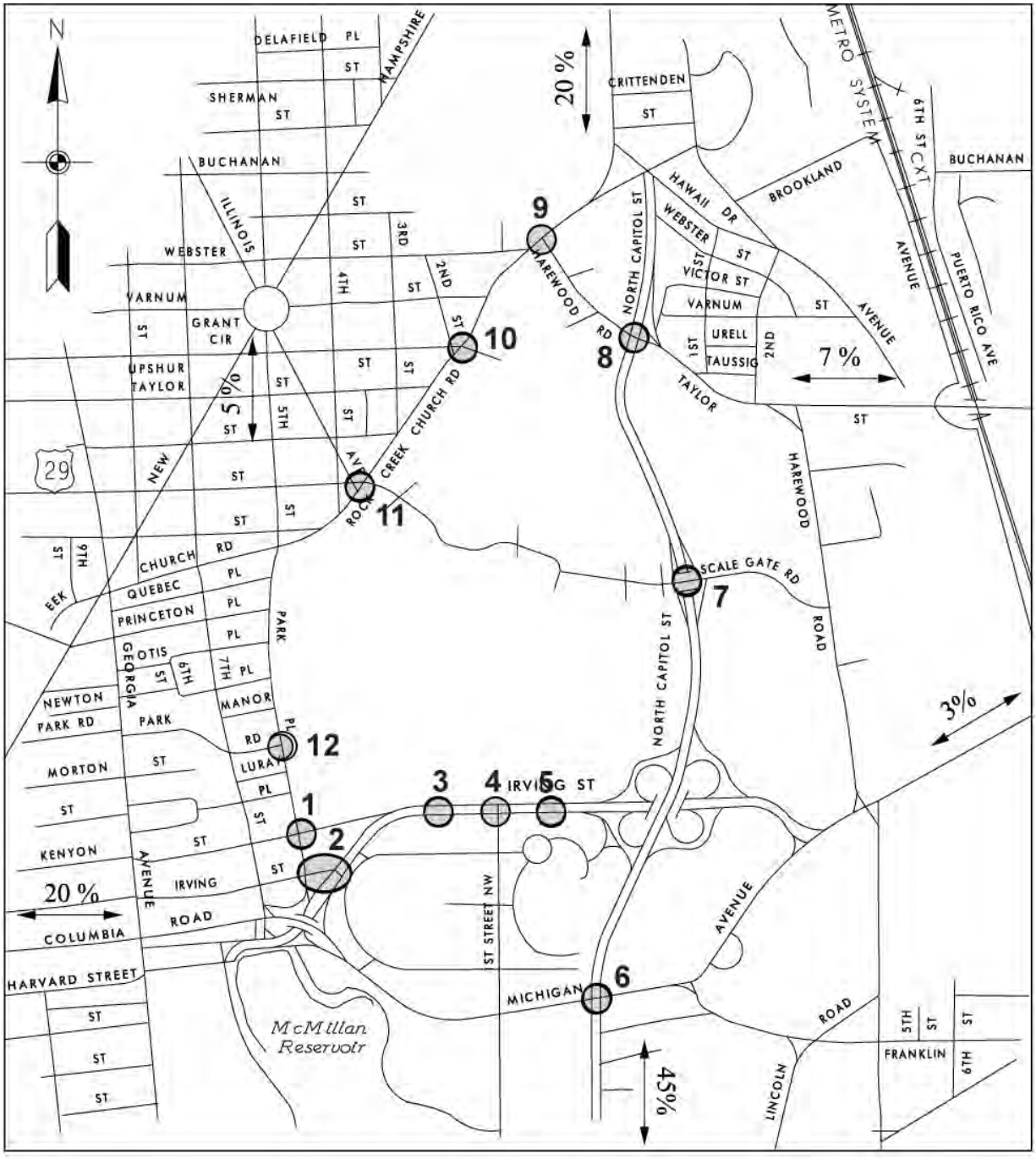


Figure 4-2: Trip Distribution Percentages - No Action Alternative

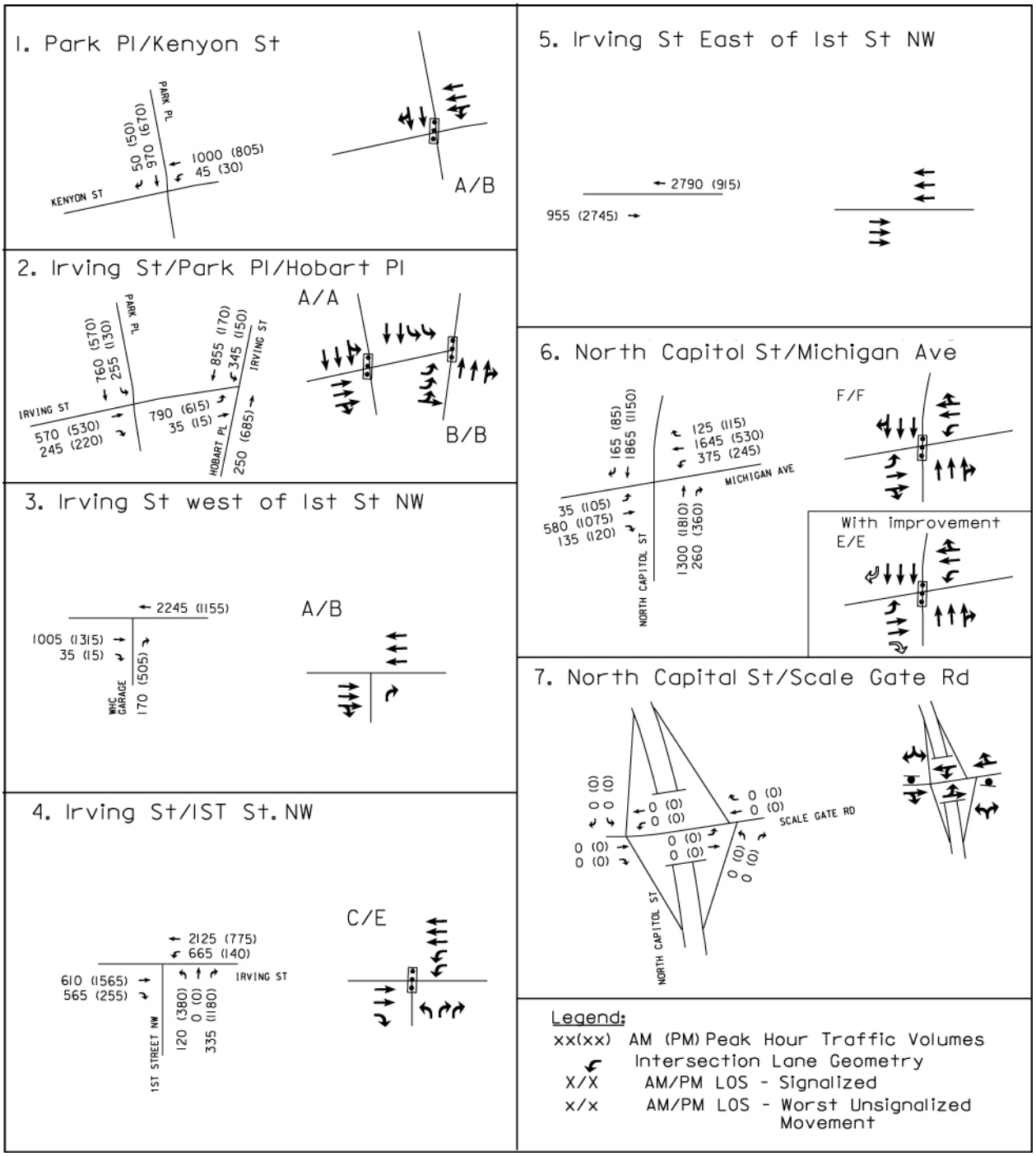


Figure 4-3a: No Action Alternative Peak Hour Traffic Volumes, LOS, & Lane Geometries

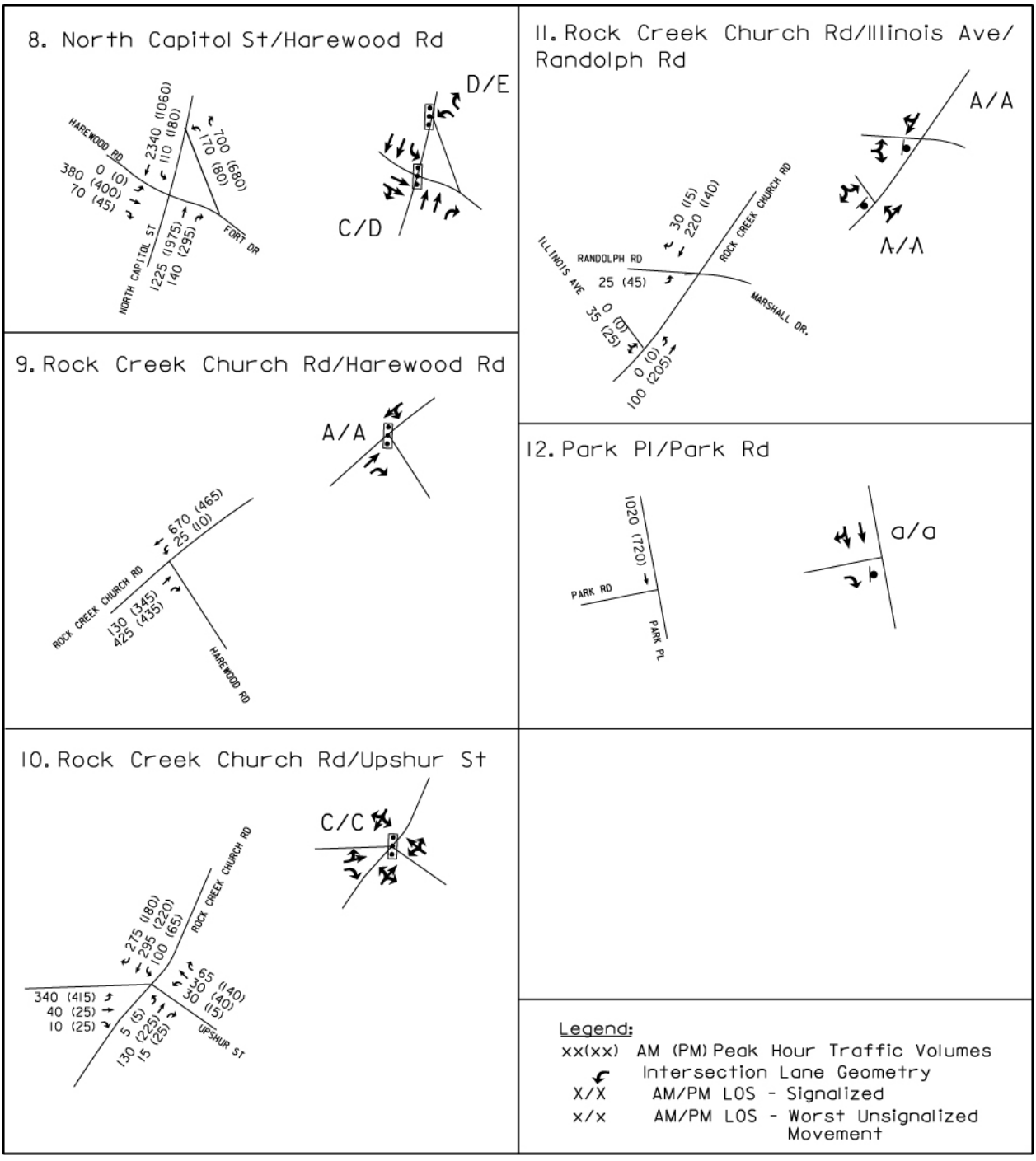


Figure 4-3b: No Action Alternative Peak Hour Traffic Volumes, LOS, & Lane Geometries

Table 4-10: No Action Levels of Service

Intersection	AM (sec of delay)	PM (sec of delay)
Park Place/Kenyon Street	A (10.0)	B (12.3)
Park Place/Irving Street	A (6.1)	A (7.1)
Irving Street/Hobart Place	B (13.4)	B (18.4)
North Capitol Street/Scale Gate Road	-	-
North Capitol Street/Harewood Road	C (23.1)	D (35.8)
North Capitol Street/Fort Drive	D (48.7)	E (68.9)
North Capitol Street/Michigan Avenue With southbound & eastbound right turn lanes	F (94.6) E (77.2)	F (87.8) E (74.7)
Irving Street/1st Street, N.W.	C (24.6)	E (61.8)
Rock Creek Church/Harewood Road	A (0.6)	A (0.3)
Rock Creek Church/Upshur Street	C (24.7)	C (21.4)
Rock Creek Church/Illinois Avenue/Randolph Road	a (1.0) *	a (1.3) *

* Lower-case letters indicate level of service for unsignalized intersection movement

Proposed Action

Trips generated by the recommended alternate were based on the number of parking places provided for each land use. These trips were assigned based on their proximity to the proposed access points and then distributed on the roadway network based on the existing traffic distributions.

Normally, ITE's Trip Generation Manual is used to estimate the site trips generated by a development. However, due to the restricted amount of parking that will be provided for this development, lower rates needed to be developed. Based on experience with past projects in the Washington D.C. metro region, a peak hour trip generation of 0.4 trip ends per parking space was assumed for office trips under constrained parking conditions. As a basis for comparison only, trip generation was then calculated using ITE Trip Generation. Initial estimates were made for constrained parking rates for each of the other land uses besides office, and then these

estimated rates were adjusted until trips for all land uses, for inbound and outbound trips, and for the AM and PM peak hours were found in approximately the same proportion to office trips for the ITE calculation, albeit with lower absolute values.

Internal capture and transit reductions were not used, the assumption being that the parking constraint would be more critical and mask the effects of those phenomena. Pass-by trips were assumed for three of the buildings with retail uses closest to the development's main entrances. Specifically, a PM peak hour pass-by rate of 20 percent was used for the retail space near the Scale Gate Road entrance, and a 30 percent PM peak hour pass-by rate was assumed for the supermarket in Building C near the signalized entrance at Irving Road and First Street.

Alternative 2

The proposed land uses and parking spaces proposed under Alternative 2 are shown in Table 4-11. The new trips which would be generated by this development were based on the number of parking places provided for each land use. The proposed plan had two primary access points to the site: the first was at the Irving Street/First Street intersection and the second was at Scale Road. The projected site trips were assigned based on the proximity of the parking to the proposed access points and then distributed on the roadway network based on the existing traffic distributions.

As shown in Table 4-11 under the proposed action, development is expected to generate approximately 7,962 vehicle trips during the AM peak hour and approximately 8,353 vehicle trips during the PM peak hour.

Table 4-11: Alternative 2 – Trip Generation

USE	ITE USE	AREA (GSF)	Parking Spaces	Trips / Park Space		AM Trip Ends	PM Trip Ends	Distribution			
				in AM Pk Hr	in PM Pk Hr			AM		PM	
								In	Out	In	Out
Zone A											
Hotel*	310	200,000	200	35%	60%	70	120	43	27	64	56
R & D	760	3,200,000	6,400	**39%**	**41%**	2,496	2,624	2,072	424	394	2,230
Junior college	540	2,200,000	4,400	58%	62%	2,552	2,728	1,888	664	1,582	1,146
Retail (Shopping Center)	820	80,000	200	40%	160%	80	320	49	31	154	166
						0	0	0	-	-	-
Subtotals		5,680,000	**11,200**			**5,198**	**5,792**	**4,052**	**1,146**	**2,193**	**3,599**
Zone B											
Hospital	720	1,600,000	3,200	43%	48%	1,376	1,536	922	454	507	1,029
Zone C											
Residential (Mid-Rise Apts)	223	950,000	950	30%	50%	285	475	88	197	276	200
Retail (Shopping Center)	820	50,000	125	40%	160%	50	200	31	20	96	104
the AFRH Zone											
High Scool	530	390,000	780	132%	40%	1,030	312	731	299	168	144
Residential (Mid-Rise Apts)	223	75,000	75	30%	50%	23	38	7	16	22	16
Subtotals		465,000	**5,130**			**1,053**	**350**	**738**	**315**	**191**	**159**
New Parking for Grant Building & King Hospital			**538**								
Grand Totals			**16,868**			**7,962**	**8,353**	**5,831**	**2,131**	**3,262**	**5,091**

Site Trip Distribution

The trip distribution for AFRH-W was developed using the existing traffic counts, the major roadways in the area, accessibility to the site, and discussions with DDOT. Two access points

are proposed for the site. The first is located at the intersection of Irving Street and First Street, forming the north leg of the intersection and the second will be at Scale Road.

The site trip distribution percentages are presented in Figure 4-4a and they are as follows:

- 20 percent to/from the west along Irving Street/ Kenyon Street/Columbia Road
- 5 percent to/from the northwest along Park Place
- 45 percent to/from the south along North Capitol Boulevard
- 3 percent to/from the east along Michigan Avenue
- 7 percent to/from the east along Fort Drive/Harewood Road/Taylor Street
- 20 percent to/from the north along North Capitol Street

Site Trip Assignment

The trip generation estimate under Alternative 2 for AFRH-W development was distributed along the study area roadways/intersections based on the trip distribution estimates previously presented.

Overall, this development is expected to add approximately 3,700 vehicles per hour (vph) along North Capitol Street south of Michigan Avenue in the AM peak hour and PM peak hours. This development is also expected to add approximately 1,600 vph along North Capitol Street north of Harewood Road during the AM peak and approximately 1,565 vph during the PM peak. Scale Gate Road west of North Capitol Street is expected to experience an increase of between 2,100 and 2,200 vph during the AM and PM peak hours.

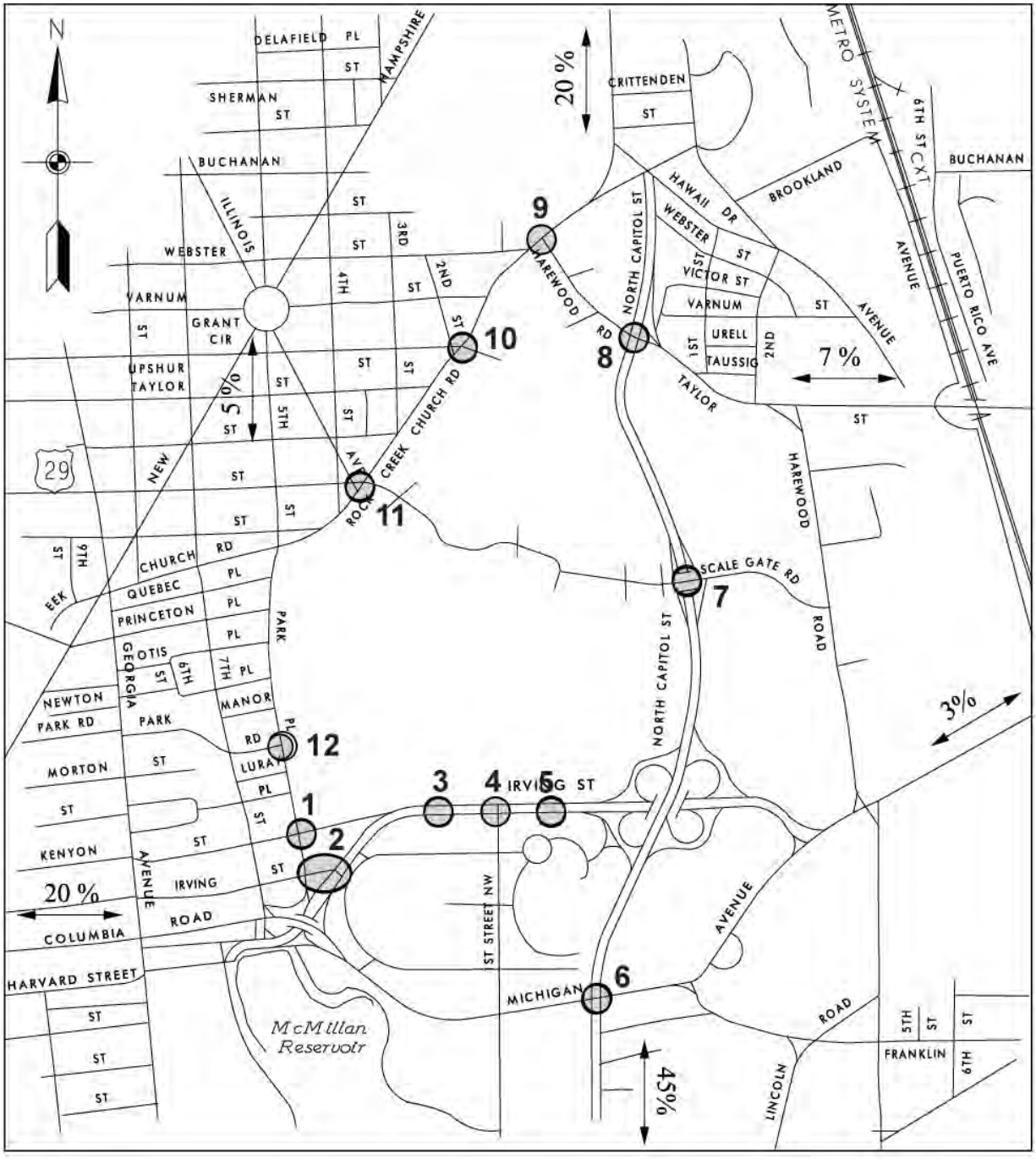


Figure 4-4a: Site Trip Assignment – Alternative 2

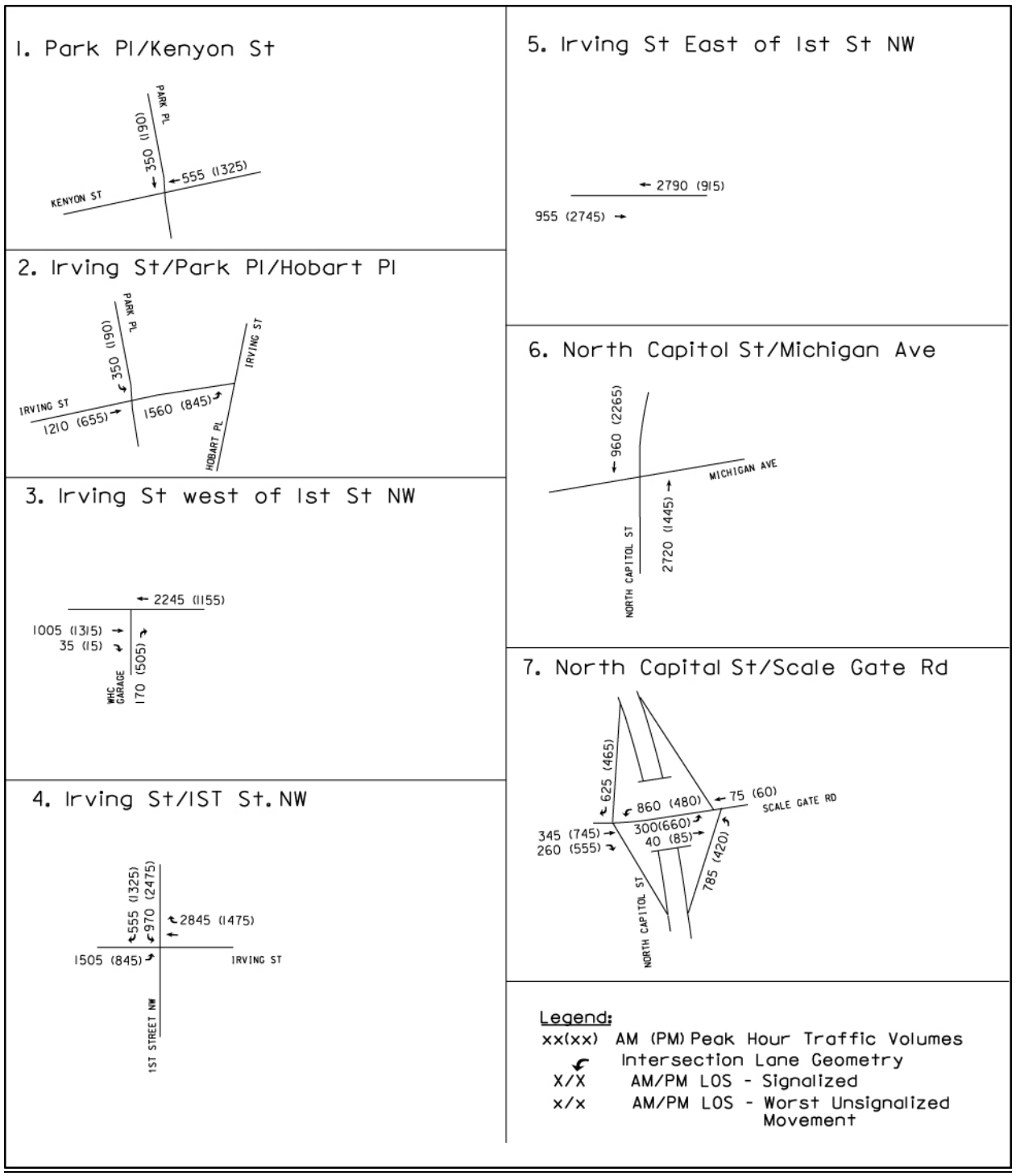


Figure 4-4b: Site Trip Assignment – Alternative 2

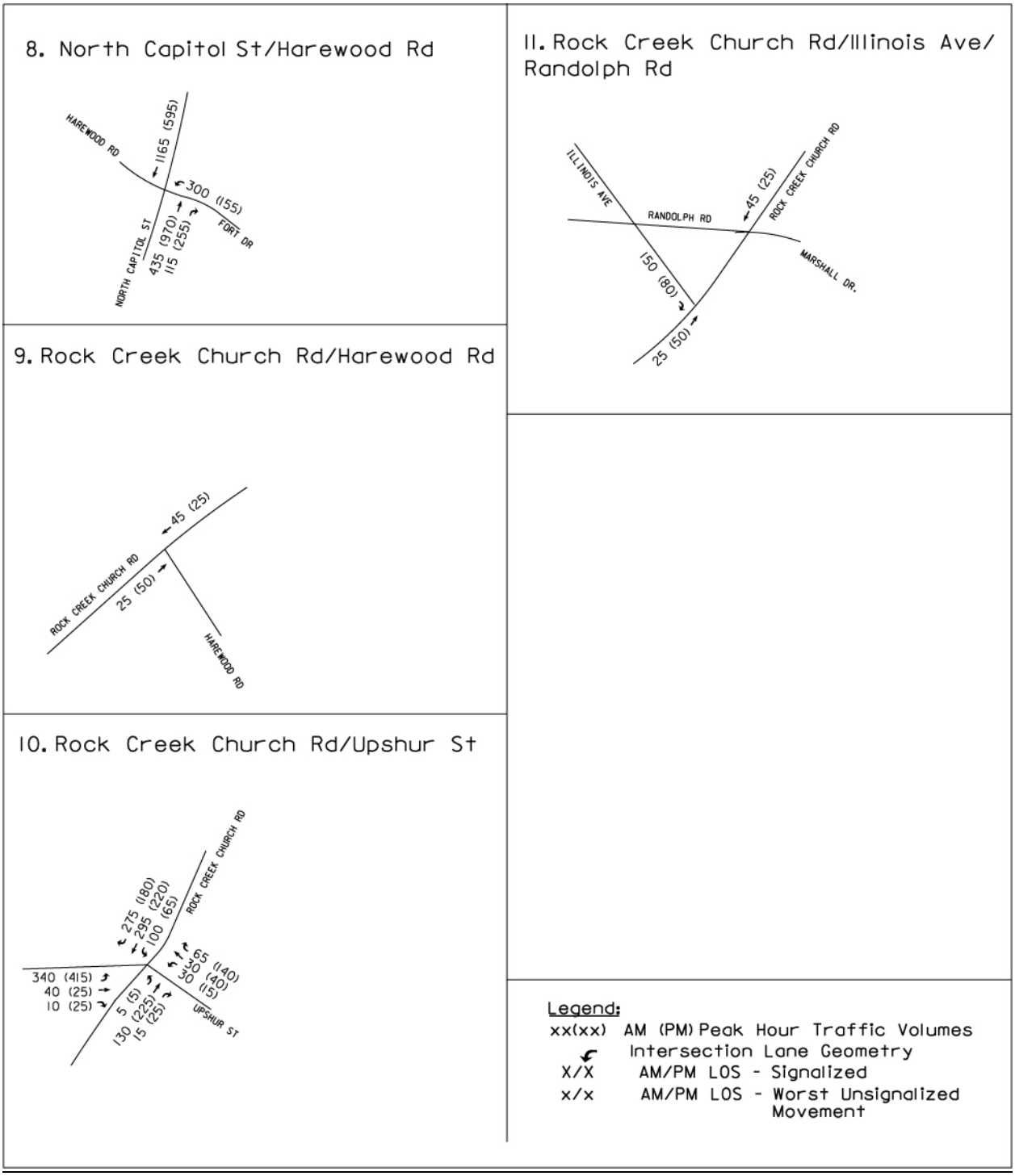


Figure 4-4c: Site Trip Assignment – Alternative 2

Traffic Operations Analysis

Total traffic volumes were determined by adding the site traffic volumes to the No Action volumes. These total traffic volumes are presented in Figure 4-5a and 4-5b. Intersection capacity analyses were performed at the study intersections and the results are also presented in Figure 4-5 and summarized in Table 4-12. With the site traffic, most intersections are expected to operate at LOS D or better during both the AM and PM peak hours, with the exception of North Capitol Street/Michigan Avenue, Irving Street/1st Street/Site Access, North Capitol Street/Fort Drive, and North Capitol Street/Harwood which would operate at unacceptable levels of service. Significant improvements to the Irving Street/1st Street NW/Site Access intersection, as shown in Figure 4-5a would accommodate the site traffic. These include a dual right turn lane on the westbound Irving Street approach, a double left turn lane on the eastbound approach, the construction of triple left turn lanes on the southbound site access, and the construction of a third eastbound through lane on Irving Street. Even with these capacity enhancements, the intersection is still expected to operate at LOS F during the peak hour.

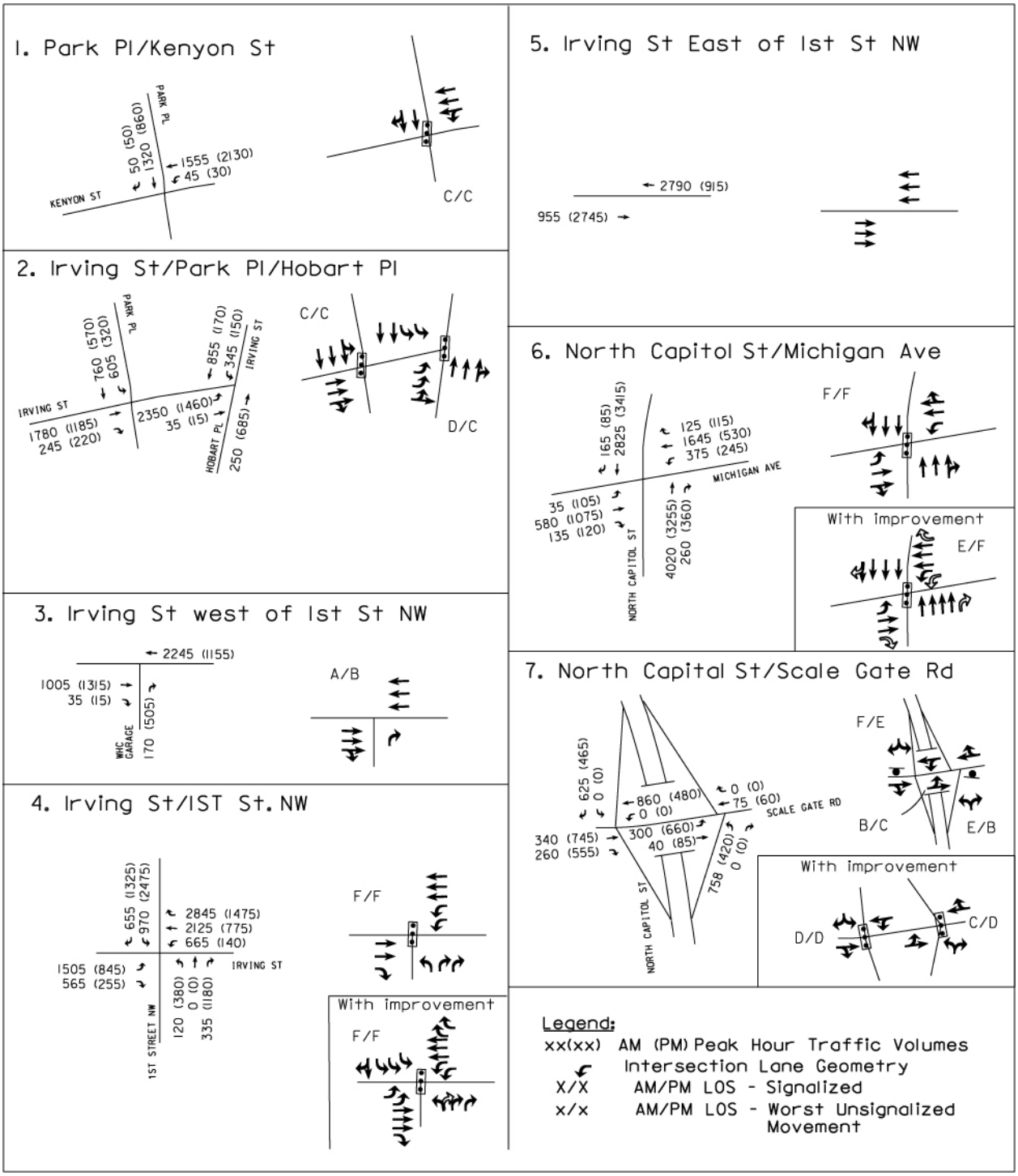


Figure 4-5a: Traffic Volumes with Improvements, LOS, and Lane Geometries - Alternative 2

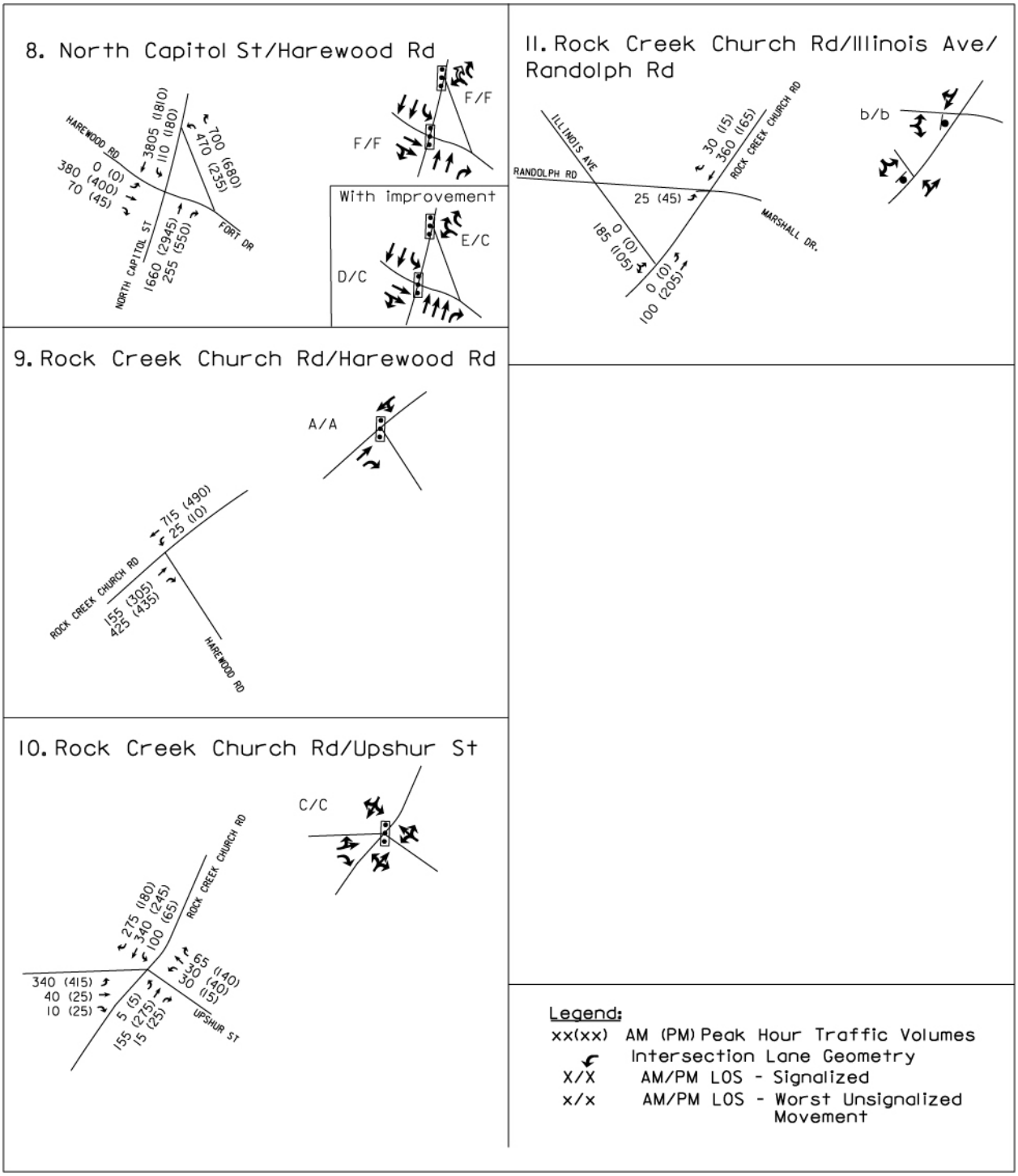


Figure 4-5b: Traffic Volumes with Improvements, LOS, and Lane Geometries - Alternative 2

Table 4-12: Alternative 2 Levels of Service

Intersection	No Action		Proposed Action	
	AM (sec of delay)	PM (sec of delay)	AM (sec of delay)	PM (sec of delay)
Park Place/Kenyon Street	A (10.0)	B (12.3)	C (26.3)	C (26.2)
Park Place/Irving Street	A (6.1)	A (7.1)	C (25.8)	C (20.9)
Irving Street/Hobart Place	B (13.4)	B (18.4)	D (35.2)	C (28.5)
North Capitol Street/Scale Gate Road Right turn from SB Off-Ramp With improvements	-	-	f (536.3) * D (40.1)	e (46.8) * D (37.3)
North Capitol Street/Scale Gate Road Left turn to NB On-Ramp With improvements	-	-	-	-
North Capitol Street/Scale Gate Road Left turn from NB Off-Ramp With improvements	-	-	e (47.8) * C (26.3)	c (15.4) * D (45.2)
North Capitol Street/Harewood Road With improvements	C (23.1)	D (35.8)	F (165.0) D (42.2)	F (102.2) C (33.0)
North Capitol Street/Fort Drive With improvements	D (48.7) C (23.0)	E (68.9) C (20.9)	F (130.8) E (70.7)	F (117.8) C (28.3)
North Capitol Street/Michigan Avenue With improvements	F (94.6) D (54.7)	F (87.8) C (29.1)	F (207.2) F (91.9)	F (200.1) E (46.8)
Irving Street/1St Street NW/Site Access 1 With improvements	C (24.6) C (24.6)	E (61.8) D (54.7)	F (675.2) F(300.9)	F (417.9) F(267.7)
Irving Street/Site Access 2	-	-	-	-
Irving Street/Site Access 3	-	-	-	-
Rock Creek Church/Harewood Road	A (0.6)	A (0.3)	A (0.9)	A (0.7)
Rock Creek Church/Upshur Street/ (AFRH Access under Prop. Action)	C (24.7)	C (21.4)	C (22.9)	C (22.6)
Rock Creek Church/Illinois Avenue/Randolph Road/ (Zone C Access under Prop. Action)	a (1.0) *	a (1.3) *	b (12.9) *	B (11.6) *

* Lower-case letters indicate lowest level of service for an unsignalized movement at the intersection

Mitigation Measures

As discussed above under the Master Plan Alternatives, a majority of the study intersections are expected to operate at LOS E or better. Alternative 2 adds significantly more traffic to the study area roadways as compared to Alternatives 3A, 3B, 3C, and 4 and consequently under Alternatives 3A, 3B, 3C, and 4 less delay is added to the study area intersections. The intersections of North Capitol Street/Fort Drive and North Capitol Street/Harewood Road are expected to operate at above capacity conditions (LOS F) during the peak hours. The provision of a northbound through lane at both these intersections would improve operations to acceptable levels at the Harewood intersection. Even with this improvement, the North Capitol Street/Fort Drive intersection would operat at LOS E during the AM peak hour. An additional westbound right turn lane at the North Capitol Street/Fort Drive intersection has already been recommended under the No-Action Conditions. The channelization island that separates the left- and right-turn lanes on the westbound approach could be reduced in size in order to provide the additional right-turn lane. Upstream of the channelization island, the left turn lane would be converted into a shared left/right turn lane, and the right turn movement would be placed under signal control.

As discussed in the previous section, the Irving Street/1st Street/Site Access 1 intersection is anticipated to operate at LOS F during the 2020 peak hours even with significant capacity expansion associated with construction of the development entrance. We do not believe that additional mitigation measures are feasible with the currently proposed distribution of land uses on AFRH-W. Much of the heavy trip-generating land uses are massed on the site near this intersection, and both the development and the Washington Hospital Center would have very high PM peak turning volumes from toward North Capitol Street to the east. Some of these trips could be shifted to the Scale Gate Road entrance. In order to improve the operations at this location, additional entrances on Irving Street and along the west side of the site should be considered. As part of any development agreement, AFRH-W would require a developer to prepare a transportation management plan detailing strategies to reduce single occupancy vehicle use such as shuttles to public transportation and incentives for carpools/vanpools.

Alternatives 3A, 3B, and 3C

Trips generated by Alternatives 3A, 3B, and 3C were based on the number of parking places provided for each land use. The differences in the trips generated were accounted for at the three entrances along Irving Street. Table 4-13 and Table 4-14 summarize the anticipated trips. These trips were assigned based on their proximity to the proposed access points and then distributed on the roadway network based on the existing traffic distributions.

As shown in Table 4-13, Alternatives 3A and 3B are expected to generate approximately 2,726 vehicle trips during the AM peak hour and approximately 3,664 vehicle trips during the PM peak hour. As shown in Table 4-14 under Alternative 3C, development is expected to generate approximately 1,906 vehicle trips during the AM peak hour and approximately 3,190 vehicle trips during the PM peak hour.

Site Trip Distribution

The trip distribution for AFRH-W was developed using the existing traffic counts, the major roadways in the area, accessibility to the site, and discussions with DDOT. Three access points are to be provided along Irving Street to serve the primary retail, office, hotel, and residential areas that comprise Zone A:

- The primary access along Irving Street, hereafter referred to as Site Access 1, is to be built opposite First Street, NW to form the fourth leg of a full-movement, signalized intersection.

- The second access point along Irving Street, hereafter referred to as Site Access 2, is to be built about midway between the First Street, NW intersection and the ramps from the North Capitol Street interchange. This intersection would have right-in/right-out access only to and from westbound Irving Street.

- The third access point along Irving Street, hereafter referred to as Site Access 3, is to be a full-movement intersection about midway between Kenyon Street and First Street.

Table 4-13: AFRH-W Trip Generation based on Parking Supply – Alternatives 3A and 3B

	USE	ITE USE	AREA (GSF)	Parking Spaces	Trips / Park Space		AM Trip Ends	PM Trip Ends	Distribution			
					in AM Pk Hr	in PM Pk Hr			AM		PM	
									In	Out	In	Out
Zone A												
Phase 2: 2009-2010												
Year 2009 (Construction Start)												
A	Hotel*	310	123,026	123	36%	50%	44	62	27	17	33	29
C	Office	710	60,000	120	39%	41%	47	49	29	18	8	41
	Retail (Grocery)	850	80,000	200	150%	300%	300	600	183	117	306	294
D	Office	710	239,426	479	39%	41%	187	196	114	73	33	163
	Retail (Shopping Center)	814	10,000	25	35%	140%	9	35	5	4	18	17
Year 2010												
E	Office	710	475,442	951	39%	41%	371	390	326	45	66	324
G	Residential (Apartment)	223	159,036	167	23%	27%	38	45	12	26	26	19
H	Residential (Condo)	232	249,833	262	18%	22%	47	58	9	38	36	22
	Retail (Shopping Center)	814	77,105	193	35%	140%	68	270	41	27	138	132
O	Residential (Apartment)	223	230,600	242	23%	27%	56	65	17	39	38	27
Phase 3: 2011-2013												
Year 2011												
I	Residential (Condo)	232	222,156	234	18%	22%	42	51	8	34	32	19
	Retail (Shopping Center)	850	16,939	42	35%	140%	15	59	9	6	30	29
Q	Residential (Apartment)	223	143,662	151	23%	27%	35	41	11	24	24	17
	Retail (Shopping Center)	933	1,700	4	35%	140%	1	6	1	1	3	3
Year 2012												
B	Assisted Living	254	240,974	253	7%	12%	18	30	12	6	13	17
J	Residential (Condo)	232	150,462	158	18%	22%	28	35	5	23	22	13
S	Office	710	170,000	340	39%	41%	133	139	117	16	24	115
	Retail (Shopping Center)	933	3,360	8	35%	140%	3	11	2	2	5	6
Year 2013												
F	Office	710	329,200	658	39%	41%	257	270	226	31	46	224
K	Residential (Condo)	232	221,375	233	18%	22%	42	51	8	34	32	19
	Retail (Shopping Center)	814	44,458	111	35%	140%	39	155	24	15	79	76
M	Residential (Apartment)	223	350,593	368	23%	27%	85	99	26	59	57	42
T	Office	710	92,044	184	39%	41%	72	75	63	9	13	62
	Retail (Shopping Center)	850	10,000	25	35%	140%	9	35	5	4	18	17
Phase 4: 2014-2015												
Year 2014												
L	Residential (Apartment)	223	114,395	120	23%	27%	28	32	9	19	19	13
	Office	710	17,461	35	39%	41%	14	14	12	2	2	12
N	Residential (Condo)	232	256,546	269	18%	22%	48	59	9	39	37	22
P	Residential (Apartment)	223	142,104	149	23%	27%	34	40	11	23	23	17
Year 2015												
R	Residential (Apartment)	223	105,472	111	23%	27%	26	30	8	18	17	13
Subtotals			4,337,369	6,215			2,096	3,002	1,330	766	1,197	1,805
* Uses parking spaces at Building Locations K, L, and G												
Zone B												
	Residential (Mid-Rise Apts)	223	880,000	880	23%	27%	202	238	38	164	148	90
Zone C												
	Residential (Mid-Rise Apts)	223	750,000	750	23%	27%	173	203	33	140	126	77
AFRH Zone												
	Junior College	540	350,000	700	35%	30%	245	210	142	103	105	105
	Residential (Mid-Rise Apts)	223	42,000	42	23%	27%	10	11	5	6	7	4
Subtotals			392,000	2,372			255	221	147	108	112	109
New Parking for Grant Building & King Hospital				538								
Grand Totals				9,125			2,726	3,664	1,548	1,178	1,582	2,082

Table 4-14: AFRH-W Trip Generation based on Parking Supply – Alternatives 3C

USE		ITE USE	AREA (GSF)	Parking Spaces	Trips / Park Space		AM Trip Ends	PM Trip Ends	Distribution			
					in AM Pk Hr	in PM Pk Hr			AM		PM	
									In	Out	In	Out
Zone A												
A	Hotel *	310	200,000	119	36%	50%	43	60	26	17	32	28
C	Office /	710	1,688,600	2,590	39%	41%	1,010	1,062	616	394	181	881
	Retail (Grocery)	850										
D	Office /	710										
	Retail (Shopping Center)	814										
G	Residential (Senior)	252	1,258,665	872	6%	8%	52	70	26	26	37	33
H	Residential (Condo) /	232	1,258,665	872	18%	22%	157	192	30	127	119	73
	Retail (Shopping Center)	814	470,763	1134	35%	140%	397	1,588	242	155	810	778
O												
Subtotals			4,876,693	**5,587**			**1,659**	**2,972**	**940**	**719**	**1,178**	**1,794**
* Uses parking spaces at Building Locations K, L, and G												
Zone B												
	Residential (Mid-Rise Apts)	223	880,000	880	25%	30%	220	264	42	178	164	100
Zone C												
	Residential (Mid-Rise Apts)	223	750,000	750	25%	30%	188	225	36	152	140	86
the AFRH Zone												
	Junior College	540	350,000	700	35%	30%	245	210	142	103	105	105
	Residential (Mid-Rise Apts)	252	42,000	42	5%	20%	2	8	1	1	5	3
Subtotals			392,000	**2,372**			**247**	**218**	**143**	**104**	**110**	**108**
New Parking for Grant Building & King Hospital				**538**								
Grand Totals				***8,497***			**1,906**	**3,190**	**1,083**	**823**	**1,288**	**1,902**

- The fourth access point along Irving Street, hereafter referred to as Site Access 4, is to be a right-in/right-out access only to and from westbound Irving Street.

Another principal access point will be via the gate at Scale Gate Road that is currently closed and where the existing diamond interchange is almost completely unutilized.

Access to the institutional and residential areas of the AFRH Zone will be provided at the existing intersection of Rock Creek Church Road and Upshur Street and via the existing intersection of Harewood Road, NW and Lincoln Drive, NW, midway between Rock Creek Church Road and North Capitol Street.

Trip distributions were determined based on the existing traffic volumes. The site trip distribution percentages are presented in Figure 4-6a and 4-8a and they are as follows:

- 20 percent to/from the west along Irving Street/ Kenyon Street/Columbia Road
- 5 percent to/from the northwest along Park Place
- 45 percent to/from the south along North Capitol Boulevard
- 3 percent to/from the east along Michigan Avenue
- 7 percent to/from the east along Fort Drive/Harewood Road/Taylor Street
- 20 percent to/from the north along North Capitol Street

Site Trip Assignment

The trip generation estimate for the proposed action for AFRH-W development was distributed along the study area roadways/intersections based on the trip distribution estimates previously presented. The site trip assignments for Alternatives 3A and 3B are presented in Figure 4-6a through 4-6c. Site trip assignments for Alternative 3C are presented in Figures 4-8a through 4-8c.

Overall, Alternatives 3A and 3B are expected to add approximately 1,125 vehicles per hour (vph) along North Capitol Street south of Michigan Avenue in the AM peak hour and approximately 1,525 vph in the PM peak hour. These alternatives would also add approximately 475 vph along North Capitol Street north of Harewood Road during the AM peak and approximately 610 vph during the PM peak. Scale Gate Road east of North Capitol Street is expected to experience an increase of approximately 100 vph during the AM peak and 160 vph during the PM peak.

Alternative 3C is expected to add approximately 555 vehicles per hour (vph) along North Capitol Street south of Michigan Avenue in the AM peak hour and approximately 470 vph in the PM

peak hour. This alternative would add approximately 144 vph along North Capitol Street north of Harewood Road during the AM peak and approximately 315 vph during the PM peak. Scale Gate Road east of North Capitol Street is expected to experience an increase of approximately 90 vph during the AM peak and 150 vph during the PM peak.

Traffic Operations Analysis

Total traffic volumes were determined by adding the site traffic volumes to the No Action volumes. These total traffic volumes for Alternatives 3A and 3B are presented in Figure 4-7a and 4-7b. These total traffic volumes for Alternatives 3C are presented in Figure 4-9a and 4-9b. Intersection capacity analyses were performed at the study intersections and the results are also presented in Figure 4-7 and 4-79 and summarized in Tables 4-15 and 4-16. As shown in Tables 4-15 and 4-16, with the site traffic, most intersections are expected to operate at LOS D or better during both the AM and PM peak hours, with the exception of Irving Street/1st Street/Site Access 1, North Capitol Street/Michigan Avenue (which also fails under the No Action Alternative), and North Capitol Street/Harewood and North Capitol Street/Fort Drive. Therefore, the proposed action would have a direct, long-term, major, adverse impact on these intersections.

Improvements would be added to the Irving Stree/1st Street NW/Site Access 1 intersection, as shown in Figure 4-7a and 4-9a. The added capacity would include a new right turn lane on the westbound Irving Street approach, the construction of double left turn lanes on the southbound site access approach, and the construction of a third eastbound through lane. Even with these capacity enhancements, the intersection is still expected to operate at LOS E during the PM peak hour. LOS D can be achieved by providing additional lanes along Irving Street; however due to the intense development along both sides of Irving and the urban nature of the corridor, LOS E may be acceptable for this intersection.

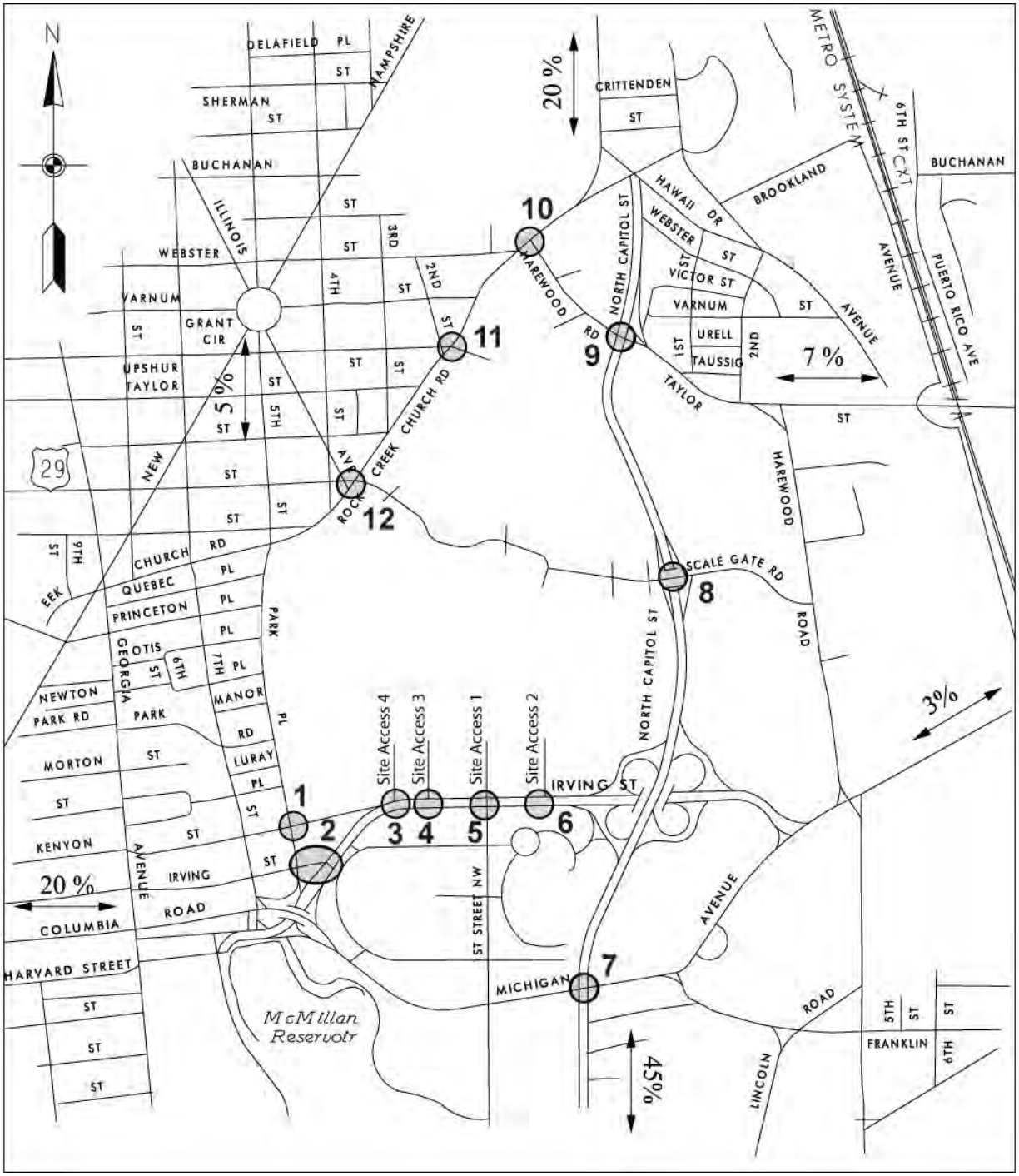


Figure 4-6a: AFRH-W Traffic Assignment - Alternatives 3A and 3B

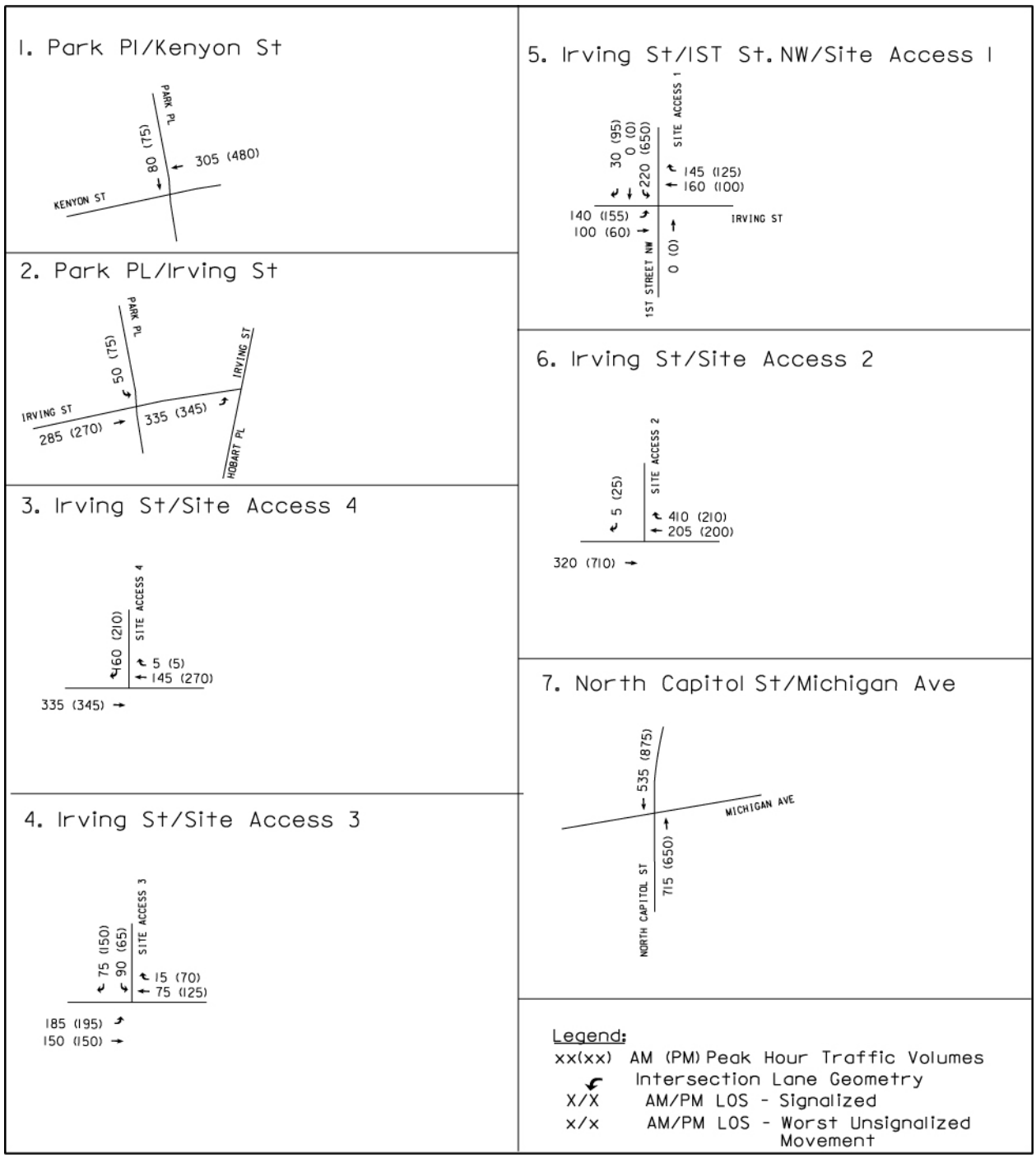


Figure 4-6b: AFRH-W Traffic Assignment - Alternatives 3A and 3B

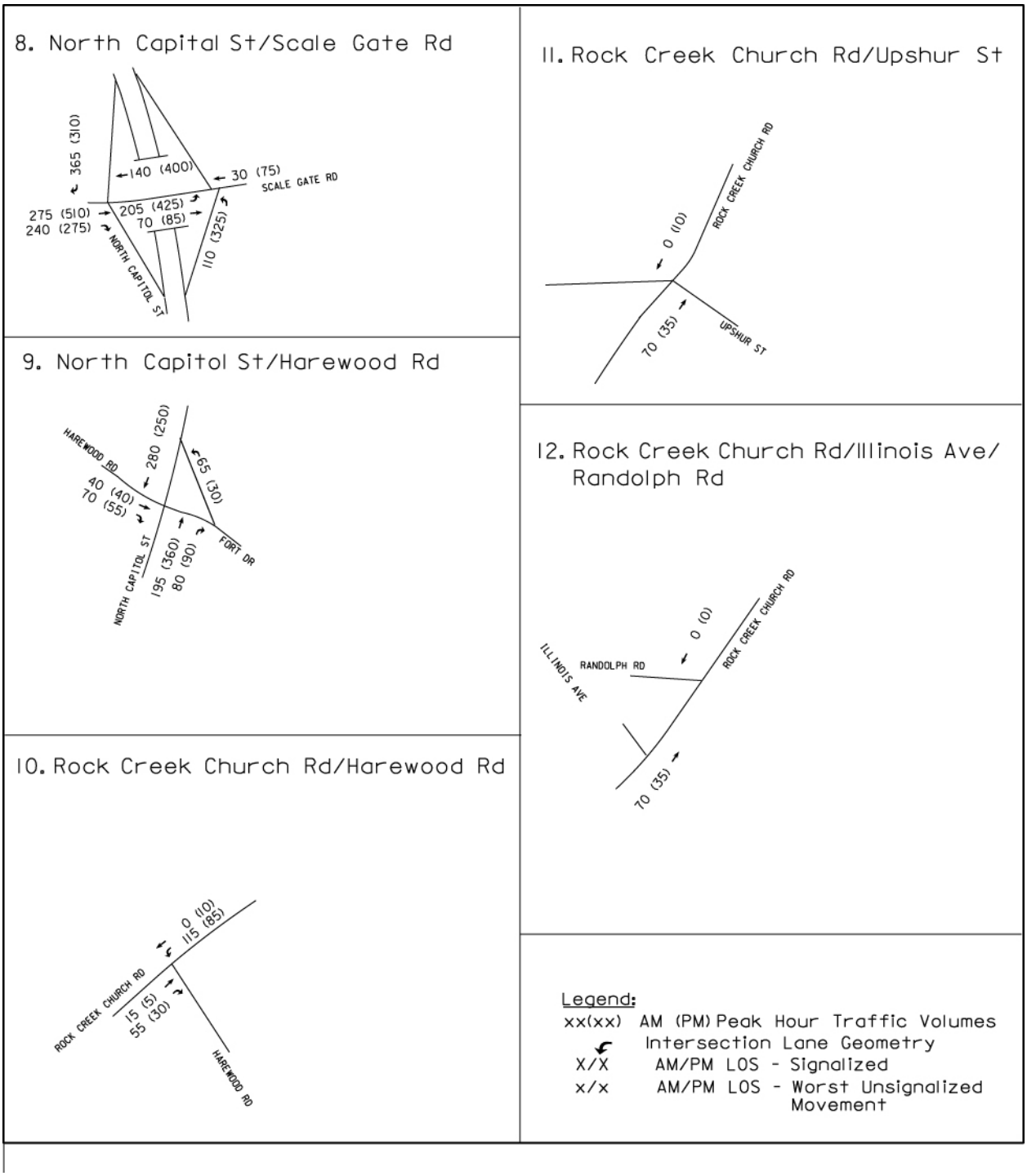


Figure 4-6c: AFRH-W Traffic Assignment – Alternative 3A and 3B

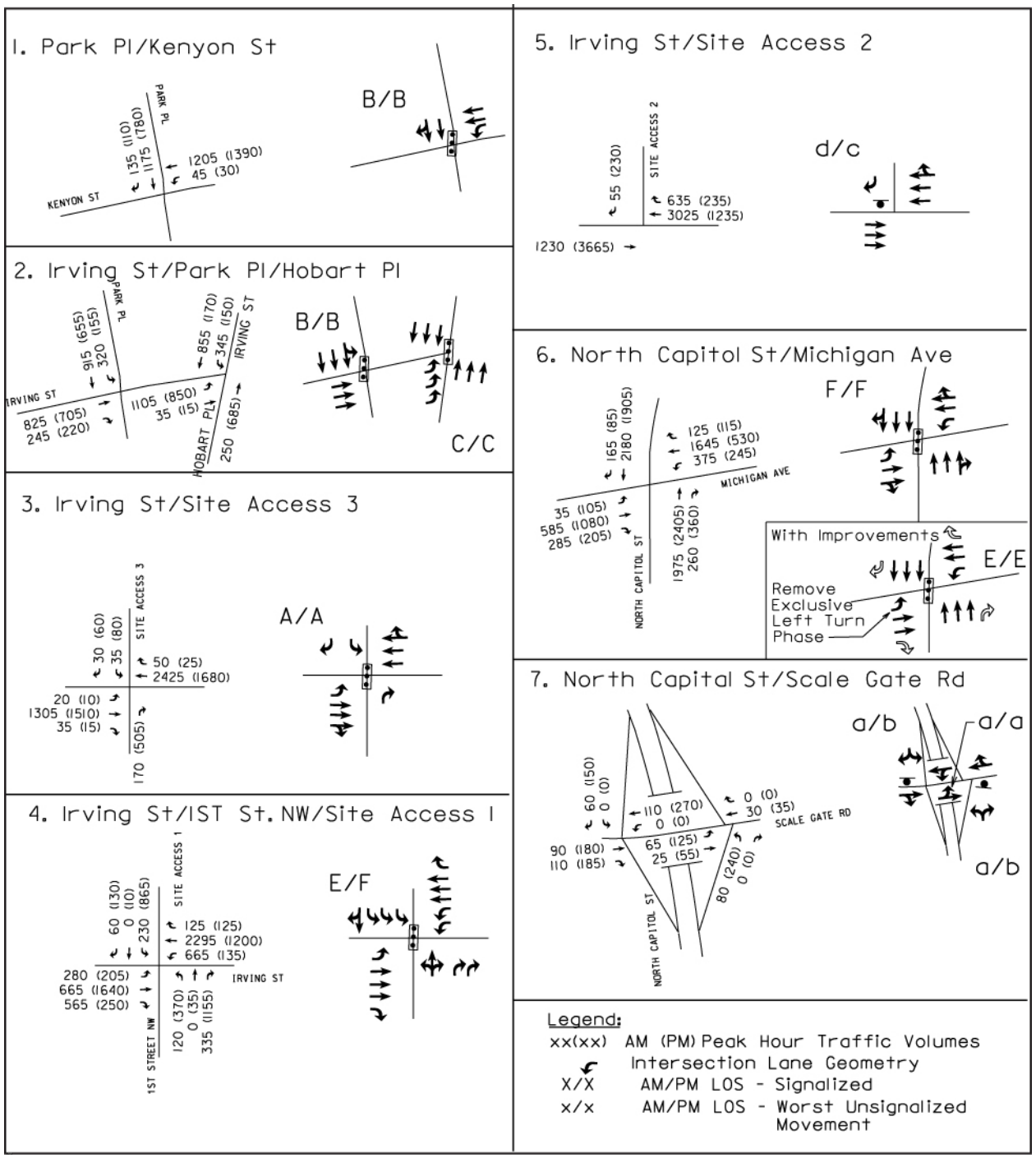


Figure 4-7a: Proposed Action Total Traffic Volumes, LOS, and Lane Geometries – Alternatives 3A and 3B

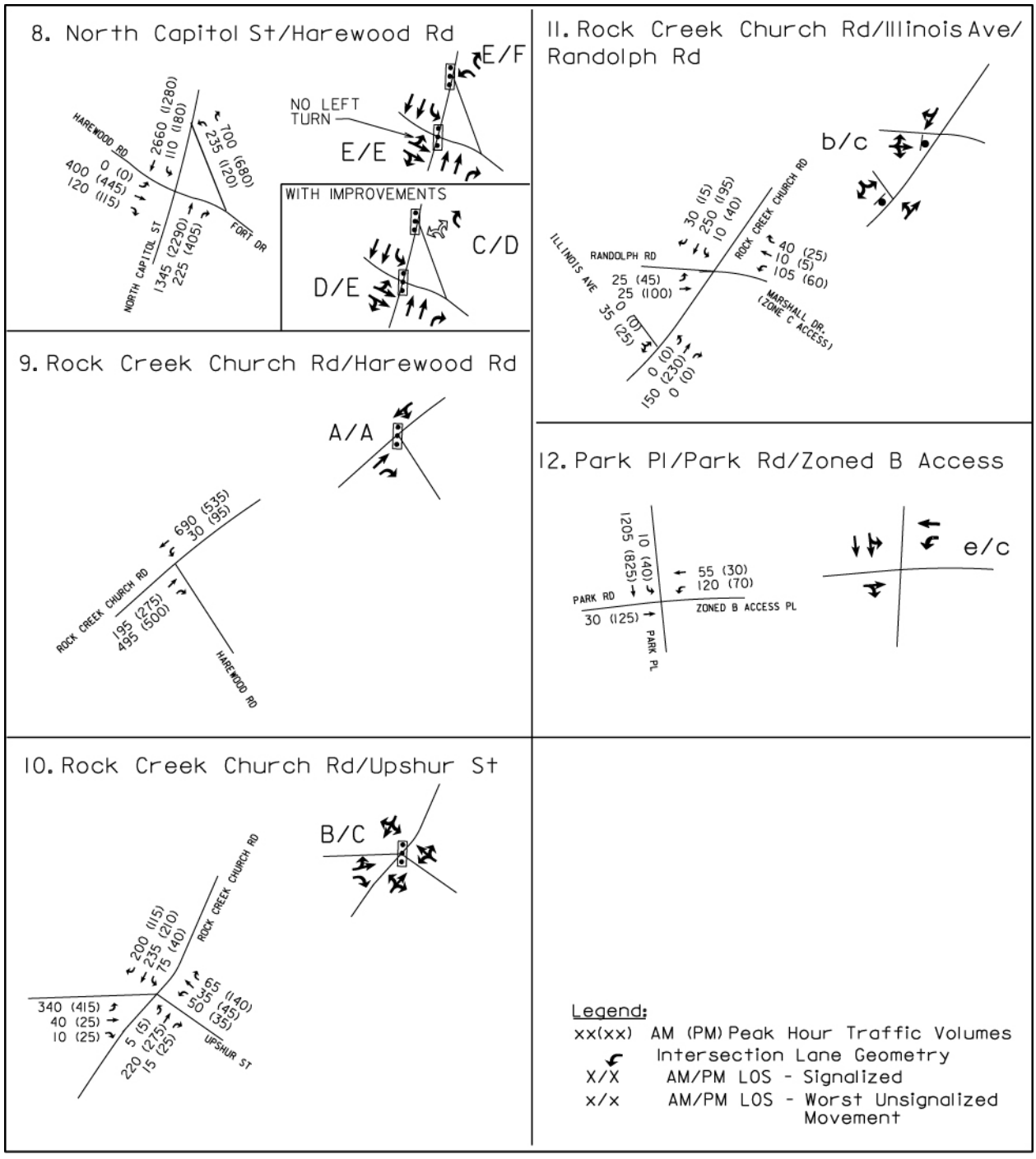


Figure 4-7b: Proposed Action Total Traffic Volumes, LOS, and Lane Geometries – lternatives 3A and 3B

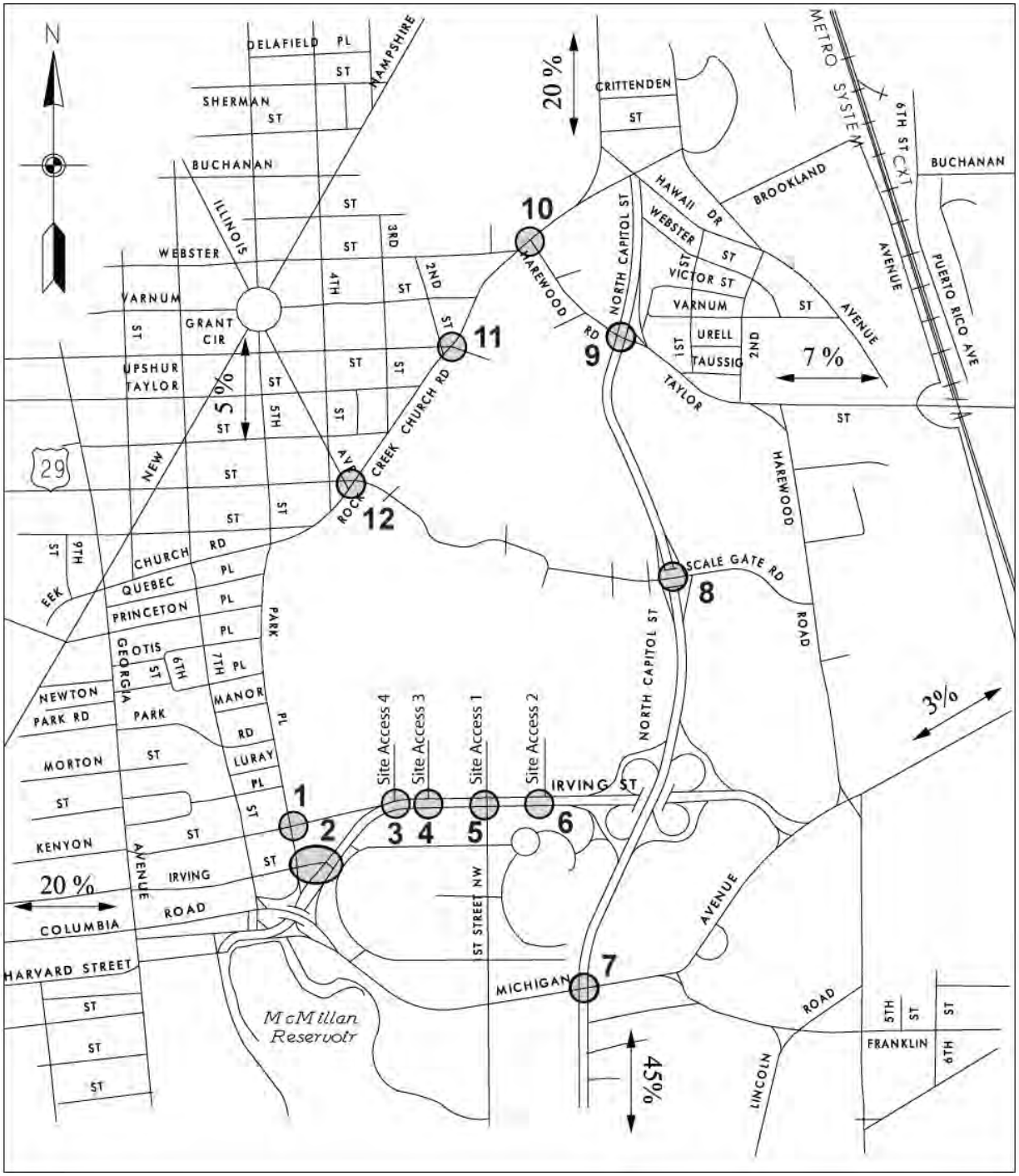


Figure 4-8a: AFRH-W Traffic Assignment - Alternatives 3C

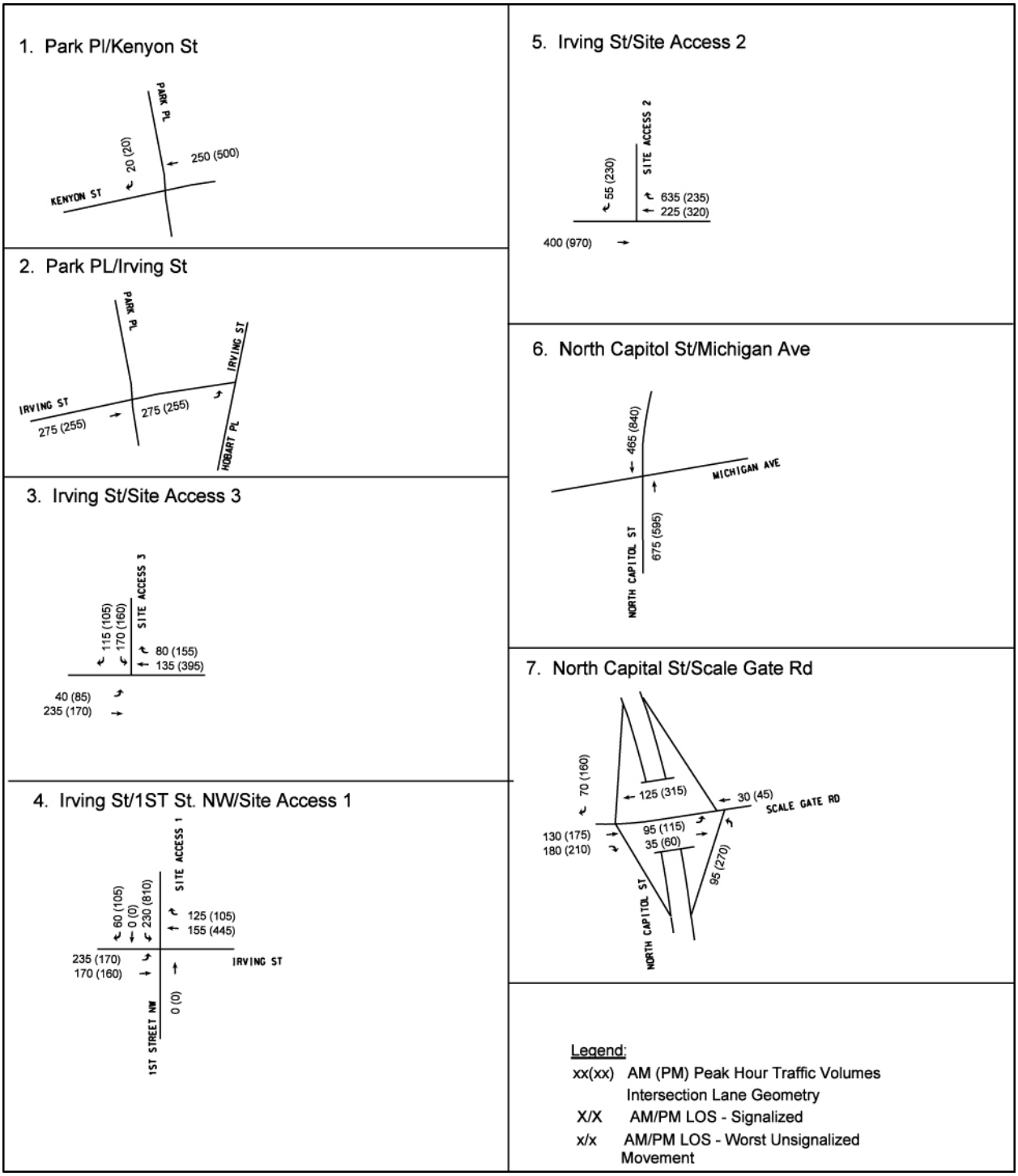


Figure 4-8b: AFRH-W Traffic Assignment - Alternatives 3C

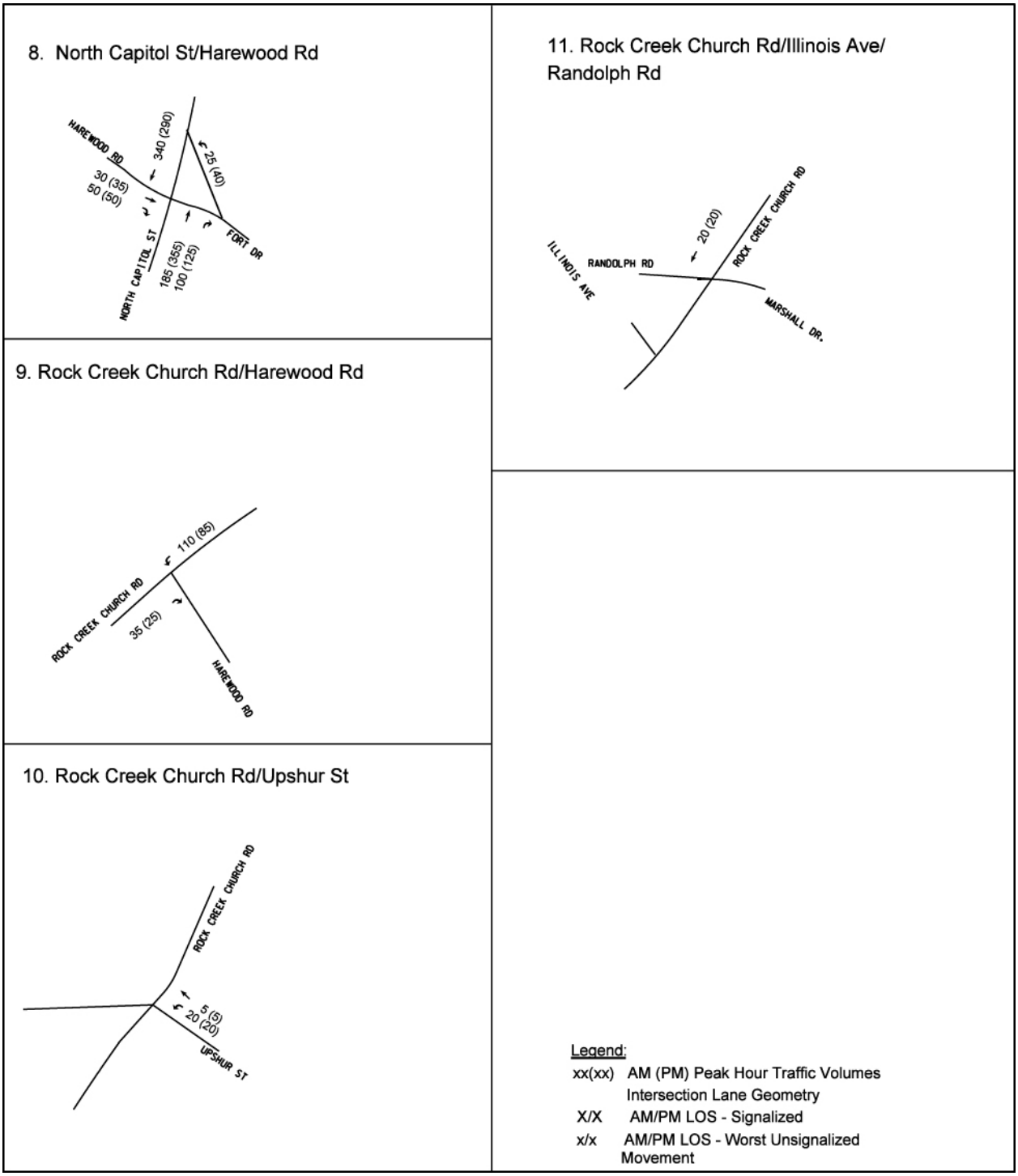


Figure 4-8c: AFRH-W Traffic Assignment - Alternatives 3C

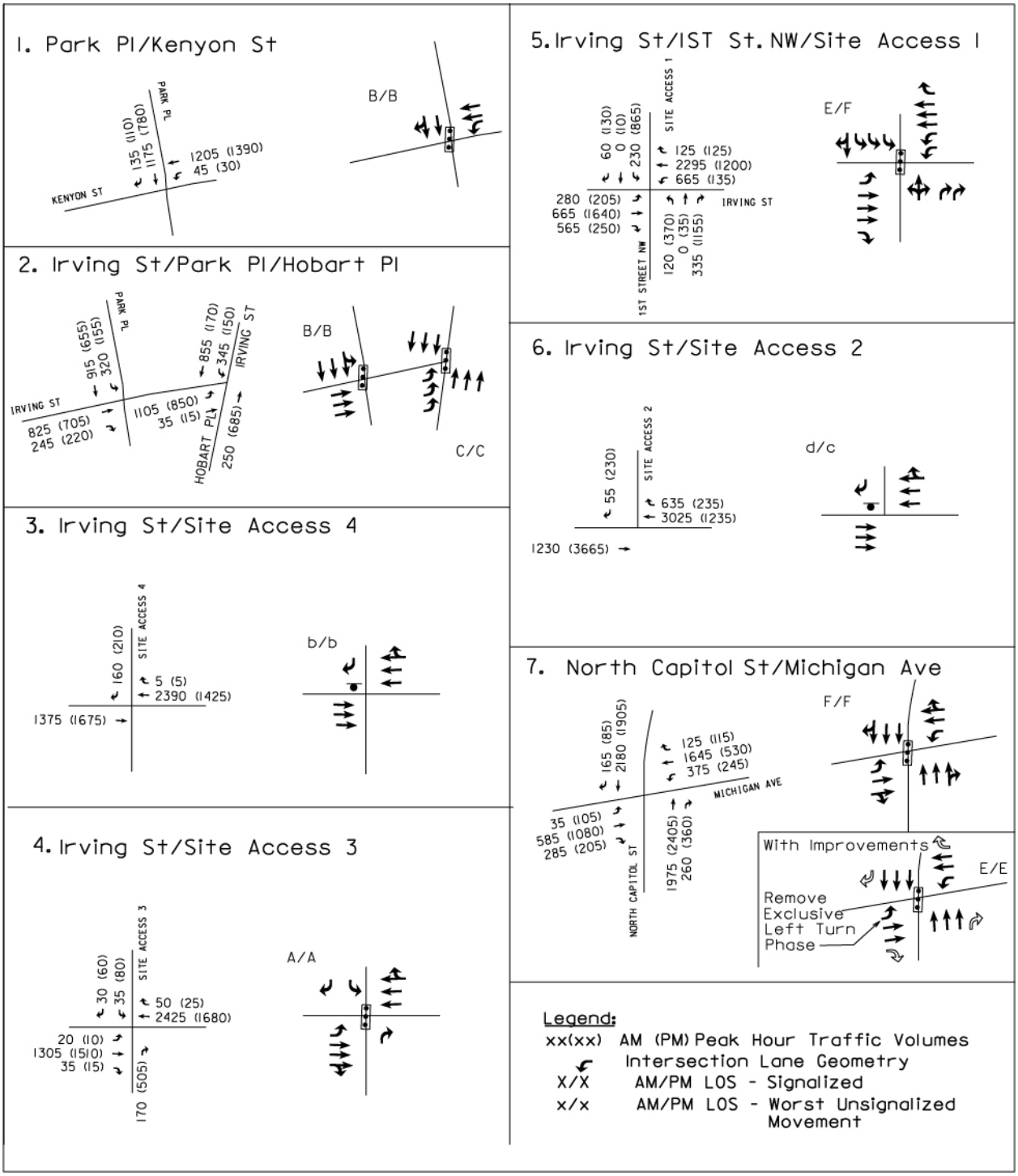


Figure 4-9a: Proposed Action Total Traffic Volumes, LOS, and Lane Geometries – Alternative 3C

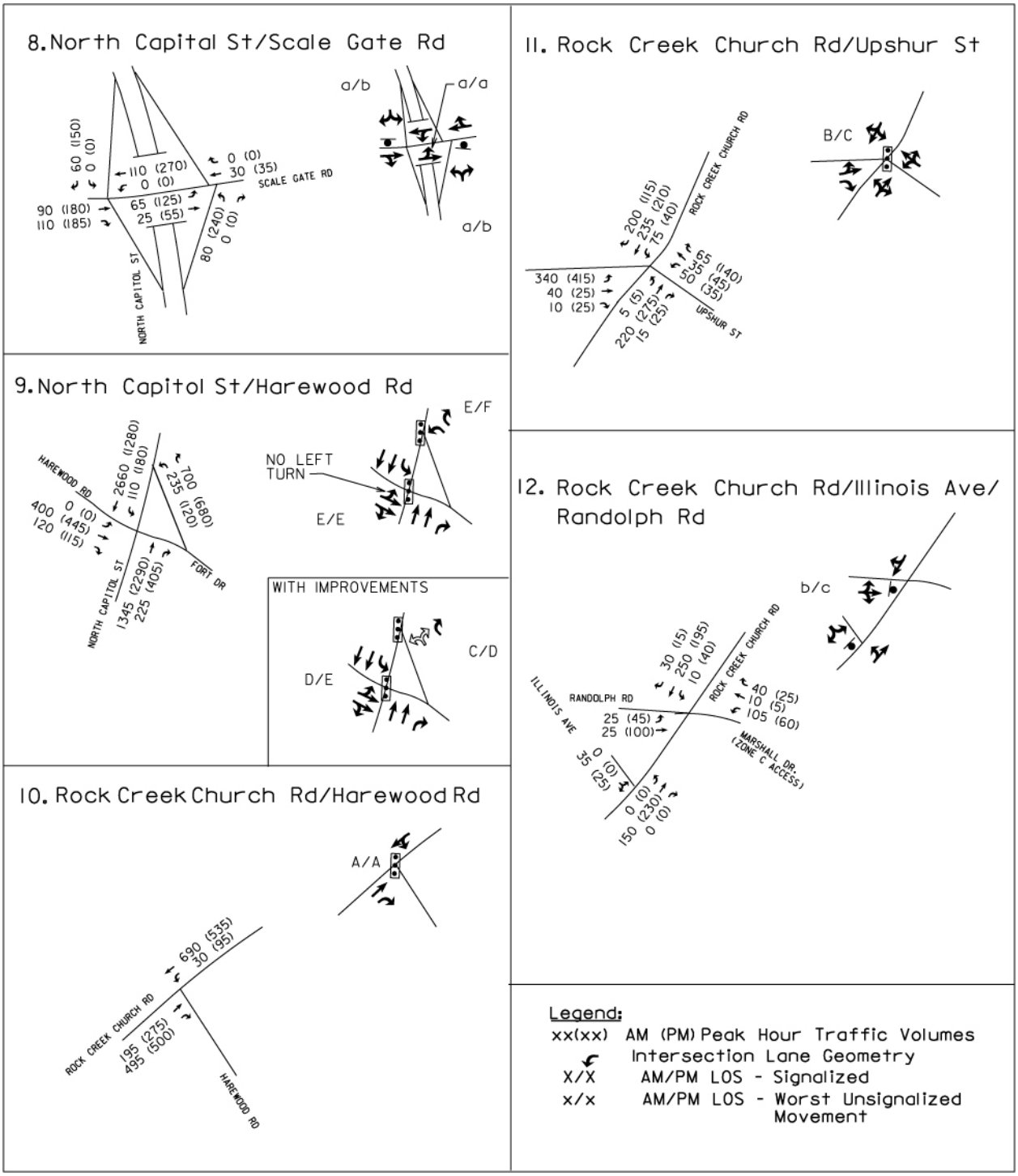


Figure 4-9b: Proposed Action Total Traffic Volumes, LOS, and Lane Geometries – Alternative 3C

Table 4-15: Proposed Action Levels of Service – Alternatives 3A and 3B

Intersection	No Action		Proposed Action	
	AM (sec of delay)	PM (sec of delay)	AM (sec of delay)	PM (sec of delay)
Park Place/Kenyon Street	A (10.0)	B (12.3)	B (19.0)	B (15.6)
Park Place/Irving Street	A (6.1)	A (7.1)	B (15.2)	B (12.2)
Irving Street/Hobart Place	B (13.4)	B (18.4)	C (21.5)	C (21.4)
North Capitol Street/Scale Gate Road Right turn from SB Off-Ramp	-	-	a (9.2) *	b (11.2) *
North Capitol Street/Scale Gate Road Left turn to NB On-Ramp	-	-	a (5.6) *	a (6.0) *
North Capitol Street/Scale Gate Road Left turn from NB Off-Ramp	-	-	a (9.2) *	b (10.6) *
North Capitol Street/Harewood Road With 2nd WB RT lane at Fort Dr.	C (23.1)	D (35.8)	E (55.8) D (46.9)	E (63.9) E (63.9)
North Capitol Street/Fort Drive With 2nd WB right turn lane	D (48.7)	E (68.9)	E (64.2) C (29.5)	F (96.0) D (39.0)
North Capitol Street/Michigan Avenue With SB & EB right turn lanes	F (94.6) E (77.2)	F (87.8) E (74.7)	F (141.5) E (77.1)	F (135.6) E (75.9)
Irving Street/1St Street NW/Site Access 1 With improvements	C (24.6) C (24.6)	E (61.8) D (54.7)	E (59.6)	F (95.5)
Irving Street/Site Access 2	-	-	d (29.9) *	b (12.6) *
Irving Street/Site Access 3	-	-	C (24.6)	A (8.0)
Irving Street/Site Access 4	-	-	b (13.8)*	b (11.1)*
Rock Creek Church/Harewood Road	A (0.5)	A (0.3)	A (0.9)	A (0.5)
Rock Creek Church/Upshur Street/ (AFRH Access under Prop. Action)	C (24.7)	C (21.4)	B (19.1)	C (33.1)
Rock Creek Church/Illinois Avenue/Randolph Road/ (Zone C Access under Prop. Action)	a (1.0) *	a (1.3) *	b (14.9) *	c (19.0) *
Park Place/Park Road/ (Zone B Access under Prop. Action)	-	-	WBL: e (43.2) *	EBTR: e (37.8) *

* Lower-case letters indicate lowest level of service for an unsignalized movement at the intersection

Table 4-16: Proposed Action Levels of Service – Alternative 3C

Intersection	No Action		Proposed Action	
	AM (sec of delay)	PM (sec of delay)	AM (sec of delay)	PM (sec of delay)
Park Place/Kenyon Street	A (10.0)	B (12.3)	B (19.0)	B (15.6)
Park Place/Irving Street	A (6.1)	A (7.1)	B (14.4)	B (12.2)
Irving Street/Hobart Place	B (13.4)	B (18.4)	C (21.7)	C (21.4)
North Capitol Street/Scale Gate Road Right turn from SB Off-Ramp	-	-	a (9.2) *	b (11.2) *
North Capitol Street/Scale Gate Road Left turn to NB On-Ramp	-	-	a (5.6) *	a (6.0) *
North Capitol Street/Scale Gate Road Left turn from NB Off-Ramp	-	-	a (9.2) *	b (10.6) *
North Capitol Street/Harewood Road With 2nd WB RT lane at Fort Dr.	C (23.1)	D (35.8)	E (55.8) D (46.9)	E (63.9) E (63.9)
North Capitol Street/Fort Drive With 2nd WB right turn lane	D (48.7)	E (68.9)	E (64.2) C (29.5)	F (96.0) D (39.0)
North Capitol Street/Michigan Avenue With SB & EB right turn lanes	F (94.6) E (77.2)	F (87.8) E (74.7)	F (139.4) E (77.1)	F (136.0) E (75.9)
Irving Street/1St Street NW/ (Site Access 1 under Proposed Action)	C (24.6)	E (61.8)	E (53.5)	F (93.9)
Irving Street/Site Access 2	-	-	d (33.1) *	c (17.1) *
Irving Street/Site Access 3	-	-	A (3.5)	A (8.4)
Irving Street/Site Access 4	-	-	b (13.8)*	b (11.1)*
Rock Creek Church/Harewood Road	A (0.5)	A (0.3)	A (0.9)	A (0.5)
Rock Creek Church/Upshur Street/ (AFRH Access under Prop. Action)	C (24.7)	C (21.4)	B (19.1)	C (33.1)
Rock Creek Church/Illinois Avenue/Randolph Road/ (Zone C Access under Prop. Action)	a (1.0) *	a (1.3) *	b (14.9) *	c (19.0) *

* Lower-case letters indicate lowest level of service for an unsignalized movement at the intersection

Mitigation Measures

As discussed above, a majority of the study intersections are expected to operate at LOS D or better. However, four intersections are expected to experience LOS E or F. It is not uncommon for intersections in highly developed/urbanized areas like Washington, D.C. to experience poor LOS during peak hours.

The intersections of North Capitol Street/Fort Drive and North Capitol Street/Harewood Road are expected to operate at capacity conditions (LOS E) during the peak hours. The provision of a northbound through lane at both these intersections would make them operate at LOS D during the peak hours. An additional westbound right turn lane at the North Capitol Street/Fort Drive intersection has already been recommended under the No-Action Conditions. The channelization island that separates the left- and right-turn lanes on the westbound approach could be reduced in size in order to provide the additional right-turn lane. Upstream of the channelization island, the left turn lane would be converted into a shared left/right turn lane, and the right turn movement would be placed under signal control.

As discussed in the previous section, the Irving Street/1st Street/Site Access 1 intersection is anticipated to operate at LOS E during the 2020 peak hours even with significant capacity expansion associated with construction of the development entrance. Much of the heavy trip-generating land uses are massed on the site near this intersection, and both the development and the Washington Hospital Center would have very high PM peak turning volumes toward North Capitol Street to the east.

As part of any development agreement, AFRH-W would require a developer to prepare a transportation management plan detailing strategies to reduce single occupancy vehicle use such as shuttles to public transportation and incentives for carpools/vanpools.

Alternative 4

Consistent with the other alternatives, trips were generated for Alternative 4 based on the number of parking places provided for each land use. These trips were assigned based on their proximity to the proposed access points and then distributed on the roadway network based on the existing traffic distributions.

As shown in Table 4-17, under Alternative 4, development is expected to generate approximately 2,500 vehicle trips during the AM peak hour and approximately 3,000 vehicle trips during the PM peak hour.

Table 4-17: Alternative 4 – Trip Generation

Building Number	USE	ITE USE	AREA (GSF)	Parking Spaces	Trips / Park Space		AM Trip Ends	PM Trip Ends	Distribution			
					in AM Pk Hr	in PM Pk Hr			AM		PM	
									In	Out	In	Out
Zone A & B												
	Office	710	700,000	1400	39%	41%	546	574	453	93	86	488
	Residential (Mid Rise Apts)	223	4,500,000	4100	22%	29%	902	1189	667	235	690	499
	Retail (Shopping Center)	820	300,000	750	25%	115%	188	862	115	73	448	414
Subtotals			5,500,000	**6,250**			**1,636**	**2,625**	**1,235**	**401**	**1,224**	**1,401**
Zone C												
	Residential (Mid-Rise Apts)	223	425,000	415	22%	28%	91	116	28	63	67	49
AFRH Zone												
	High Scool	530	390,000	780	94%	32%	733	250	520	213	135	115
	Residential (Mid-Rise Apts)	223	75,000	75	22%	28%	17	21	5	12	12	9
Subtotals			465,000	**1,270**			**750**	**271**	**526**	**224**	**147**	**124**
New Parking for Grant Building & King Hospital				**538**								
Grand Totals				**8,058**			**2,477**	**3,012**	**1,789**	**688**	**1,438**	**1,574**

Site Trip Distribution & Assignment

The trip distribution percentages presented under the discussion for Alternative 2 were also applied for this alternative. The trips generated for Alternative 4 were distributed to the roadway network per the previously described percentages (see Figure 4-10a through 4-10c).

Overall, this development is expected to add approximately 1,115 vph along North Capitol Street south of Michigan Avenue in the AM peak hour and approximately 1,355 vph in the PM peak hour. This development is also expected to add approximately 495 vph along North Capitol Street north of Harewood Road during the AM peak and approximately 600 vph during the PM peak.

Traffic Operations Analysis

Total traffic volumes were determined by adding the site traffic volumes to the No Action volumes. These total traffic volumes are presented in Figure 4-11a and 4-11b. Intersection capacity analyses were performed at the study intersections and the results are also presented in Figure 4-11 and summarized in Table 4-18. With the site traffic, most intersections are expected to operate at LOS D or better during both the AM and PM peak hours, with the exception of Irving Street/1st Street/Site Access 1, North Capitol Street/Michigan Avenue, and North Capitol Street/Harwood and North Capitol Street/Fort Drive. Therefore, the proposed action would have a direct, long-term, major, adverse impact on the North Capitol Street/Fort Drive, North Capitol

Street/Harewood, North Capitol Street/Michigan Avenue intersection, and Irving Street/1st Street NW/Site Access 1 intersections.

Please note that it has been anticipated that, under Alternative 4, significant capacity would be added to the Irving Street/1st Street NW/Site Access 1 intersection, as shown in Figure 4-11a. The added capacity would include a new right turn lane on the westbound Irving Street approach, the construction of triple left turn lanes on the southbound site access approach, the construction of a third eastbound through lane, and double eastbound left turn lanes. Even with these capacity enhancements, the intersection is still expected to operate at LOS E during the PM peak hour.

Table 4-18: Alternative 4 Levels of Service

Intersection	No Action		Proposed Action	
	AM (sec of delay)	PM (sec of delay)	AM (sec of delay)	PM (sec of delay)
Park Place/Kenyon Street	A (10.0)	B (12.3)	B (19.9)	C (23.2)
Park Place/Irving Street	A (6.1)	A (7.1)	C (21.3)	C (21.0)
Irving Street/Hobart Place	B (13.4)	B (18.4)	C (24.4)	C (27.2)
North Capitol Street/Scale Gate Road Right turn from SB Off-Ramp	-	-	e (45.1) *	b (10.1) *
North Capitol Street/Scale Gate Road Left turn to NB On-Ramp	-	-	a (7.3) *	c (15.4) *
North Capitol Street/Scale Gate Road Left turn from NB Off-Ramp	-	-	c (15.6) *	a (9.5) *
North Capitol Street/Harewood Road With improvements	C (23.1)	D (35.8)	E (57.0) B (15.7)	E (68.3) D (51.5)
North Capitol Street/Fort Drive With improvements	D (48.7) C (23.0)	E (68.9) C (20.9)	F (102.0) E (63.4)	B (18.6) B (16.4)
North Capitol Street/Michigan Avenue With improvements	F (94.6) D (54.7)	F (87.8) C (29.1)	F (111.2) F (91.9)	E (61.4) E (55.3)
Irving Street/1St Street NW/Site Access 1 With improvements	C (24.6) C (24.6)	E (61.8) D (54.7)	D (45.4) D (41.9)	F (117.4) E (79.9)

Rock Creek Church/Harewood Road	A (0.6)	A (0.3)	A (0.9)	A (0.7)
Rock Creek Church/Upshur Street/ (AFRH Access under Prop. Action)	C (24.7)	C (21.4)	C (22.9)	C (22.6)
Rock Creek Church/Illinois Avenue/Randolph Road/ (Zone C Access under Prop. Action)	a (1.0) *	a (1.3) *	b (12.9) *	b (11.6) *

* Lower-case letters indicate lowest level of service for an unsignalized movement at the intersection

Mitigation Measures

The intersections of North Capitol Street/Fort Drive and North Capitol Street/Harewood Road are expected to operate at or above capacity conditions (LOS E or F) during the peak hours. The provision of a southhbound through lane at both these intersections would make them operate at LOS D during the peak hours. An additional westbound right turn lane at the North Capitol Street/Fort Drive intersection has already been recommended under the No-Action Conditions. The channelization island that separates the left- and right-turn lanes on the westbound approach could be reduced in size in order to provide the additional right-turn lane. Upstream of the channelization island, the left turn lane would be converted into a shared left/right turn lane, and the right turn movement would be placed under signal control.

Due to geometric constraints, improvements at the North Capitol Street/Irving Street intersection may not be feasible. Even with improvements, this intersection is expected to operate at LOS F during the AM peak hour and LOS E during the PM Peak hour. However, these improvements will decrease overall intersection delay.

As discussed in the previous section, the Irving Street/1st Street/Site Access 1 intersection is anticipated to operate at LOS E during the PM peak hours even with significant capacity expansion associated with construction of the development entrance. With the improvements suggested, this intersection is expected to operate at LOS D ruing the AM peak hour and LOS E during the PM peak hours.

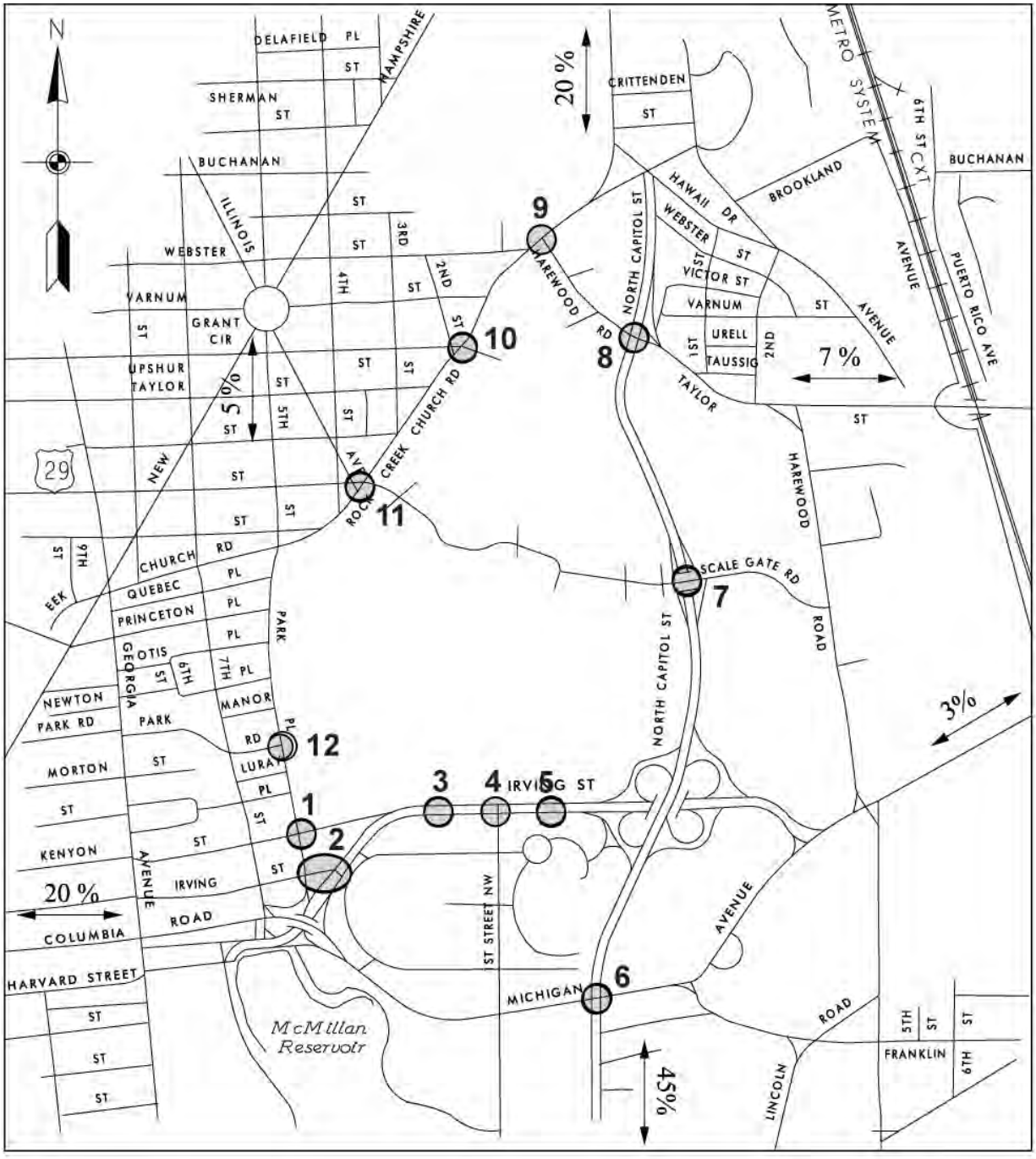


Figure 4-10a: Site Trip Assignment -Alternative 4

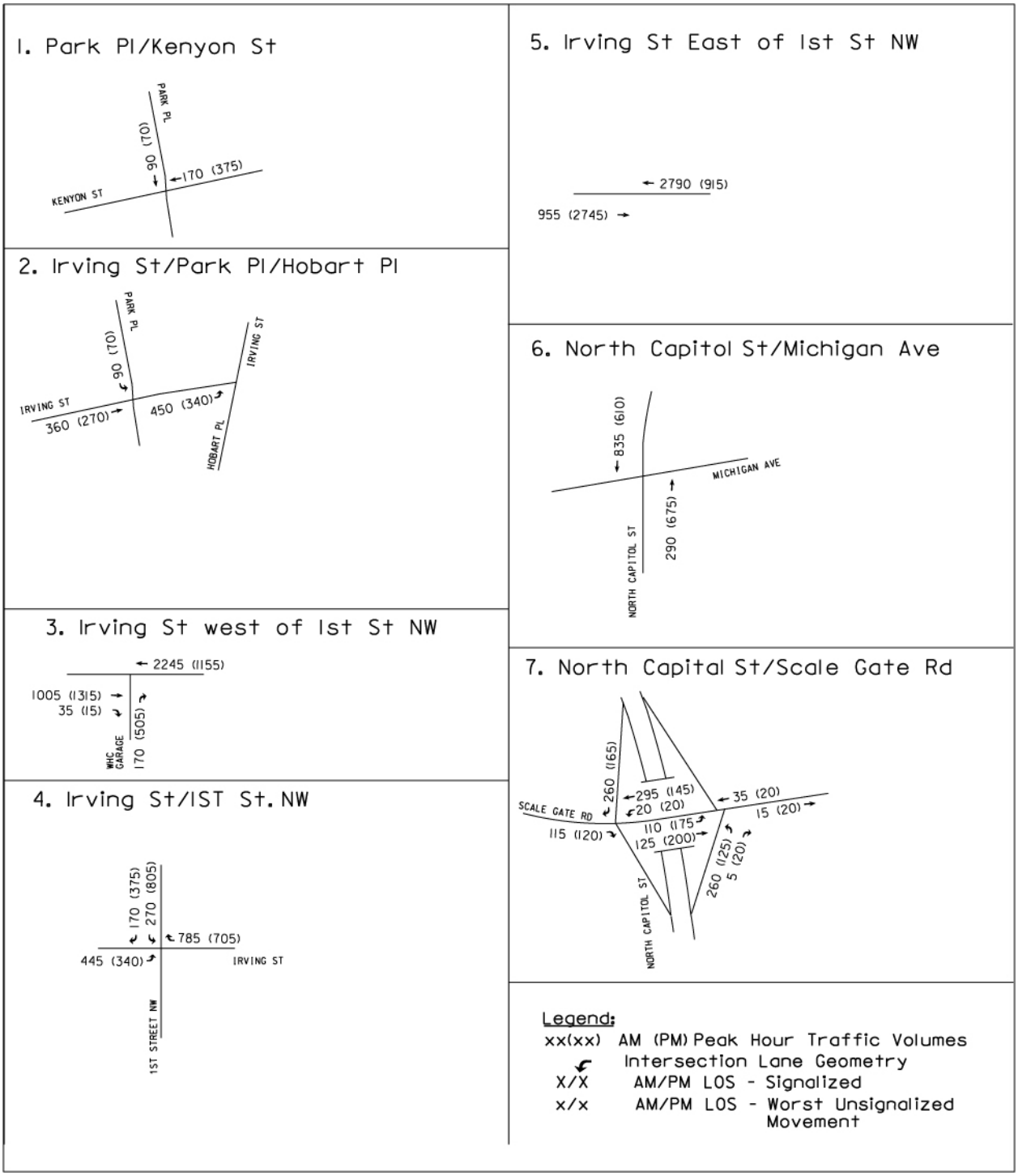


Figure 4-10b: Site Trip Assignment -Alternative 4

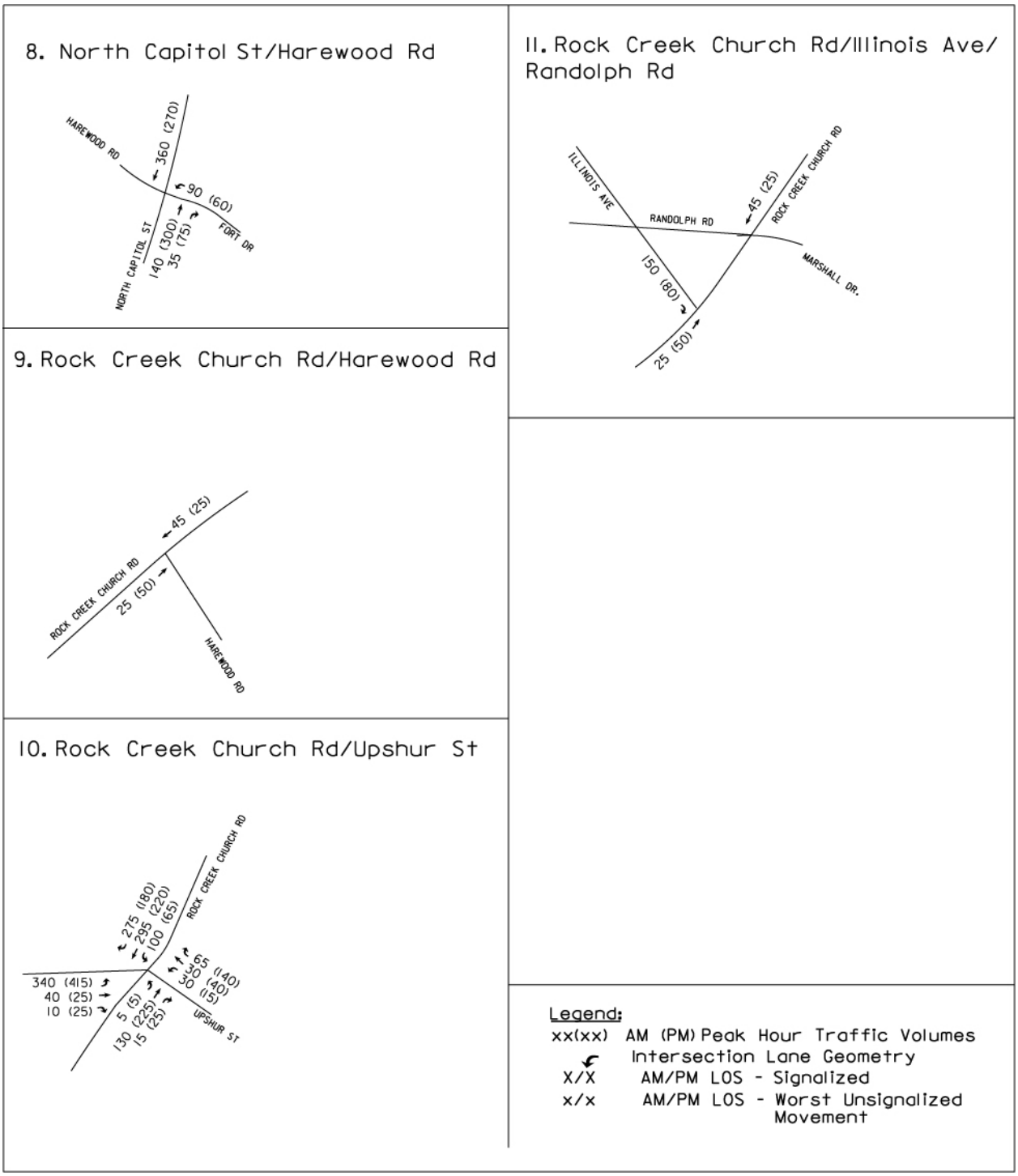


Figure 410c: Site Trip Assignment -Alternative 4

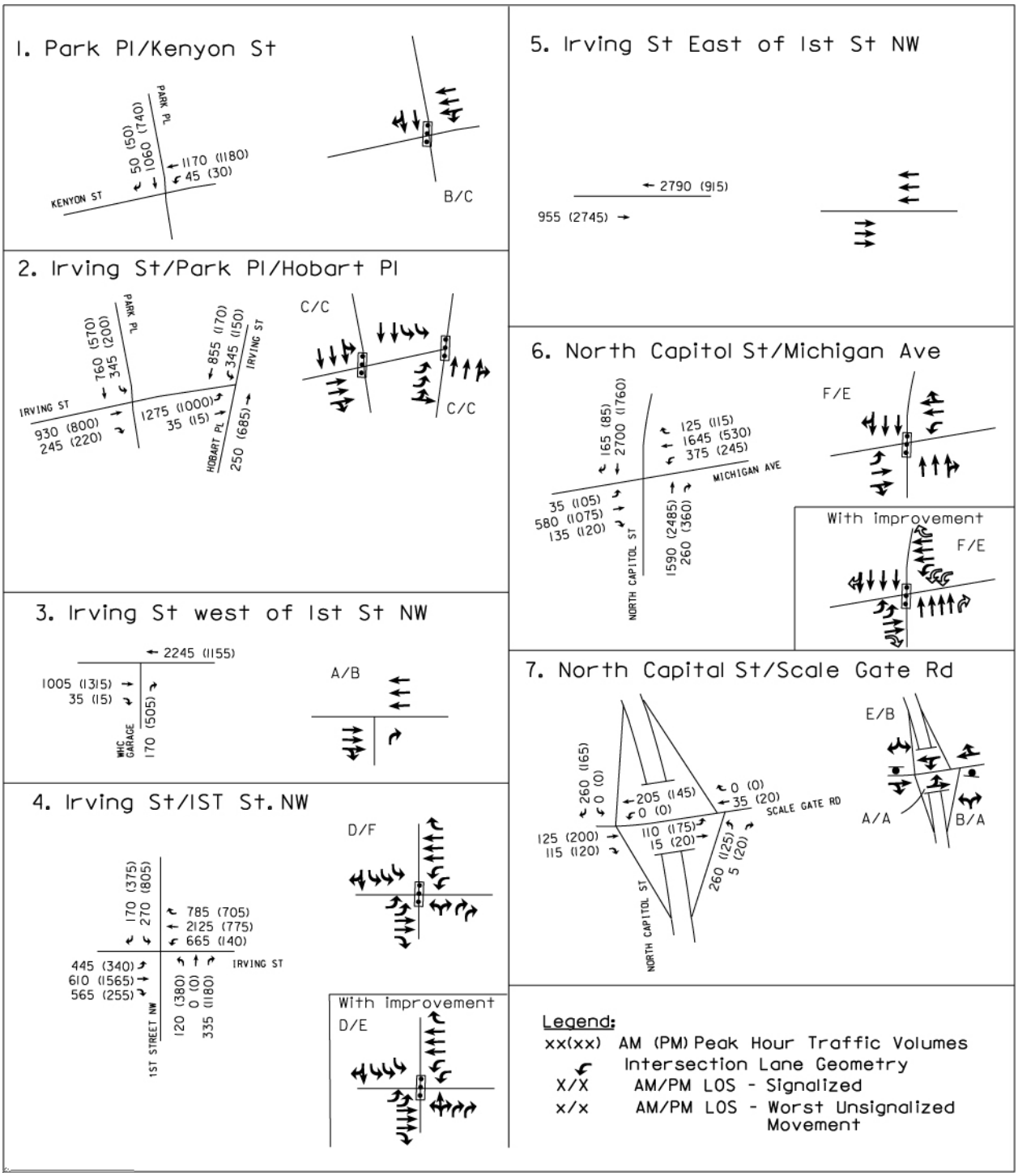


Figure 4-11a: Total Traffic Volumes, Lane Geometries, and LOS Results - Alternative 4

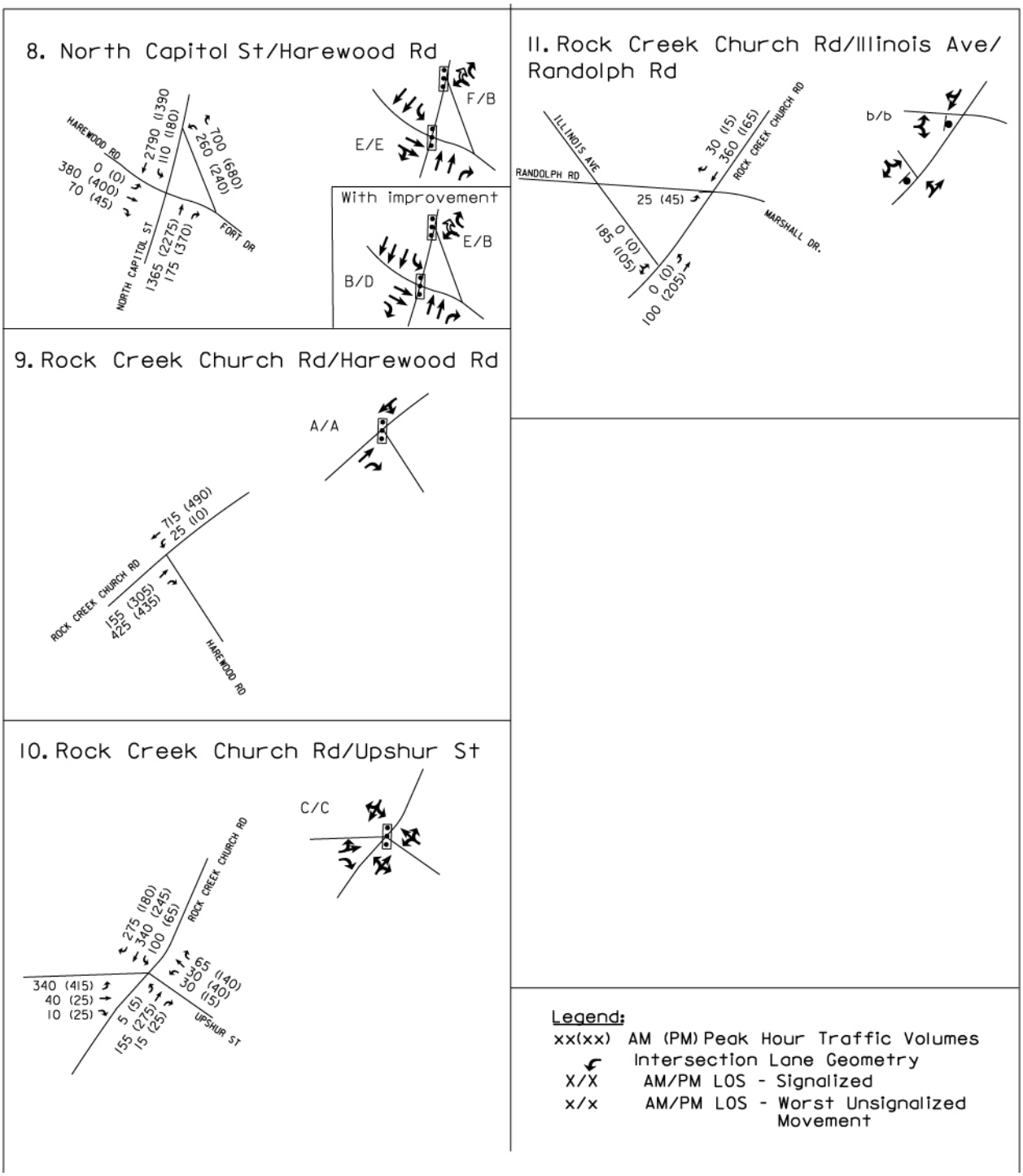


Figure 4-11b: Total Traffic Volumes, Lane Geometries, and LOS Results - Alternative 4

4.5 Air Quality

4.5.1 No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, AFRH-W would maintain its current operations and no changes in air emissions would occur. Therefore, there would be no direct, indirect, or cumulative impacts to air quality resulting from the No Action Alternative.

4.5.2 Proposed Action – Alternatives 2, 3A, 3B, 3C, and 4

The air quality analysis for AFRH-W was performed in accordance with guidelines set forth by 23 CFR Part 771, 49 CFR Part 622, the CAA, the NEPA, and the *Guidance for the Analysis of Air Quality Studies Performed as a result of the Environmental Impact Screening Form Process* (DCDOH 2003), as they appropriately apply. The analysis addresses both mobile and stationary sources of air pollutant emissions anticipated to change as a result of development of the Master Plan Alternatives. Additional information is included in Appendix B, Air Quality Assessment.

4.5.2.1 Direct Impacts

Mobile Source Analysis

The analysis of mobile sources for AFRH-W focuses on CO because it is localized and directly relates to traffic volumes and patterns which will be affected by future site development. This analysis was prepared in accordance with guidance set forth by the U.S. Environmental Protection Agency (EPA) *A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections* (EPA 1995). Fourteen air quality receptor locations were selected to represent sensitive air quality locations near the intersection of North Capitol Street and Michigan Avenue. This intersection, without any improvements, represents the worst-case intersection because of it would operate at a Level-of-Service F in 2020 for the Build Alternatives.

The mathematical model used to estimate future CO concentrations is the current version of the EPA's CAL3QHC dispersion model, released in June 1993. The CAL3QHC dispersion model is a microcomputer-based modeling methodology developed to predict the level of CO or other inert pollutant concentrations for motor vehicles traveling near roadway intersections.

The CAL3QHC program requires that roadways be modeled as series of straight segments with a constant width and traffic volume; these segments are referred to as links. Links can be either

free-flow links for vehicles moving at a constant velocity or queue links for idling vehicles. The required inputs for free-flow links are the coordinates of the endpoints, traffic volume, the emission factor, source height, and mixing zone width. Required inputs for queue links are the endpoints, approach traffic volume, emission factor, average signal cycle length, average red time length, number of travel lanes, clearance lost time, source height, signal type (pre-timed, actuated, or semi-actuated), and arrival rate. CAL3QHC also requires the input of meteorological factors. These factors are average timing, surface roughness coefficient, settling velocity, deposition velocity, wind speed, mixing height, stability class, and wind angle range. The values used for these factors are summarized in Table 4-19**.**

Table 4-19: CAL3QHC Modeling Assumptions

Input Variable	Assumption and/or Value
Intersection	North Capitol Street and Michigan Avenue
Averaging Time	60 minutes
Surface Roughness	175 cm
Settling Velocity	0 cm/s
Deposition Velocity	0 cm/s
Source Height	0 m (at grade)
Emission Factors	15.055 for queue links 5.473 for free flow links for 3 pm – 7 pm and 7 am – 10 am (based on 410 mph) 3.877 for free flows links for 7 pm – 7 am 4.946 for free flow links for 10 am – 3 pm
Signal Type	1 for Pretimed
Average Signal Length	140 seconds
Average Red Signal Length	50 seconds for the Northbound and Southbound directions 70 seconds for the Westbound direction 80 seconds for the Eastbound direction
Clearance Lost Time	5 seconds (all directions)
Arrival Rate	2 (below average progression)
Saturation Flow	1600

Input Variable	Assumption and/or Value
Wind Speed	1.0 m/s
Wind Direction	0^o
Atmospheric Stability Class	D(4)
Mixing Height	1000 m
Background Concentration	3.2 for 1-hour ; 2.3 for 8-hour
Multiple Wind Directions	Yes
Wind Direction Increment Angle	5^o
First Increment Multiplier	0
Last Incremental Multiplier	72

Using CAL3QHC, both the 1-hour and 8-hour CO levels were predicted near the North Capitol Street and Michigan Avenue intersection, and the results were compared to the NAAQS for CO. The maximum 1-hour CO concentrations were modeled using the AM and PM peak hour traffic volumes. To determine the maximum 8-hour average CO concentration, the hourly traffic volumes were calculated by using the AM and PM peak-hour traffic volumes and daily traffic distributions by hour (diurnal curve). The hourly time segments were analyzed at each receptor to determine the CO concentrations for each hour. The highest eight consecutive hourly concentrations were averaged to obtain the 8-hour average CO concentration. None of the maximum CO concentrations for the peak AM and PM hours would exceed the NAAQS of 35 ppm for 1-hour emissions. Likewise, none of the eight hour averages would exceed the NAAQS of 9 ppm for 8-hour emissions. Although the CO emissions near the intersection of North Capitol Street and Michigan Avenue would not exceed NAAQS, the Build Alternatives would cause an increase in localized CO emissions. Therefore, mobile sources would have direct, minor impacts on air quality.

Stationary Source Analysis

Additional site development at AFRH-W under the Master Plan Alternatives would increase energy demands and air pollutants emitted by on-site facilities required to accommodate this demand. According to *The Master Plan, Steam System Evaluation* (February 2005), approximately 50 percent of the existing AFRH-W boiler system capacity is available to

accommodate the increased demand; however, it would be insufficient to serve the needs of all of the development proposed under the Master Plan Alternatives. Therefore modifications to the system, primarily increased boiler capacity, would be required.

New Source Review (NSR)

Under provisions of the Clean Air Act, new major stationary sources of air pollution and major modifications to major stationary sources must have an air pollution construction permit. The process for obtaining the permit is called New Source Review (NSR). Under the NSR process, permits for sources located in attainment areas are referred to as Prevention of Significant Air Quality Deterioration (PSD) permits; while permits for sources located in non-attainment areas are referred to as Non-Attainment Area (NAA) permits. As the Washington DC area does not meet NAAQS for ozone, and based on the calculated emission loads of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) as presented in Table 4-20, implementation of any of the Master Plan alternatives would require review of a NAA permit. Further design of the selected alternative, and implementation of emission reducing technologies may bring the calculated emissions below the *de-minimus* threshold thereby negating the need for a NAA permit.

Annual facility-wide potential-to-emit (PTE) emissions for each Master Plan Alternative were assessed using EPA AP-42 pollutant emissions factors for natural gas fired boilers. The annual PTE emissions for applicable criteria air pollutants (tons/year) are presented in Table 4-20.

Table 4-20: Annual PTE Emissions for Applicable Criteria Pollutants (tons/yr)

(Facility Wide)

Alternatives	SO_2	NO_x	CO	PM_{10}	VOC
Alternative 2	0.2	73.2	32.4	2.9	2.1
Alternative 3A	0.2	77.1	34.1	3.1	2.2
Alternative 3B	0.3	84.7	37.5	3.4	2.5
Alternative 3C	0.3	82.9	36.6	3.3	2.4
Alternative 4	0.3	83.6	37.0	3.4	2.4
New Source Review Major Source Threshold	100	100	100	100	100

None of the Master Plan alternatives would exceed the NSR threshold for NO_x and therefore none would be classified as a NSR major source. Development under these alternatives may not

require a NAA permit. Therefore, stationary sources under any of the Master Plan alternatives would have direct, long-term, moderate, adverse impacts on air quality.

Federal Air Conformity Analysis

In addition, in non-attainment areas such as Washington, DC, new stationary sources must be evaluated under the provisions of the General Conformity Rule to determine if its emissions would:

- Cause or contribute to new violations;
- Increase the frequency or severity of existing violations; or
- Delay timely attainment or interim emission reductions.[30]

As Washington, DC is non-attainment for ozone, *de minimus* levels of 25 tons per year have been established for NO_x and VOC. Federal projects that fall below the *de minimus* levels are considered to be in conformance with the Clean Air Act.

Pursuant to the General Conformity Rule, all reasonably foreseeable emissions associated with energy requirements for the Master Plan Alternatives were quantified and compared to the applicable annual *de minimus* levels to determine potential air quality impacts. The annual PTE emissions for applicable criteria pollutants (tons/year) for additional boiler capacity are presented in Table 4-21.

Table 4-21: Annual PTE Emissions for Applicable Criteria Pollutants (tons/yr) for Additional Boiler Capacity

Alternatives	NO_x	VOC
Alternative 2	59.7	1.7
Alternative 3A	57.5	1.7
Alternative 3B	63.8	1.9
Alternative 3C	63.5	1.8
Alternative 4	62.5	1.8
annual *de minimus* levels	25	25

The annual PTE NO_x emissions estimated for all the Master Plan alternatives indicate that emissions would exceed the annual *de minimus* NO_x threshold of 25 tons per year. In

[30] Air Force Center for Environmental Excellence General Conformity Rule Fact Sheet, 2000.

accordance with the General Conformity Rule, if the direct and indirect emissions of a criteria pollutant (or its precursors) are above the *de minimus* level, AFRH would prepare a formal general conformity determination for that pollutant.

The annual PTE VOC emissions estimated for all the Master Plan Alternatives indicate that emissions would not exceed the annual *de minimus* VOC threshold of 25 tons per year. Therefore, implementation of the Master Plan Alternatives is expected to have a minimal VOC air quality impact and no further analysis would be required.

4.5.2.2 Temporary Construction Impacts

Air quality may be temporarily impacted by construction activities. Fugitive dust would be generated during the demolition of existing structures, site grading, construction, wind erosion, and vehicular activities. Emissions from construction equipment including earth moving equipment, demolition equipment, and paving equipment, would generate VOCs and NO_x. Construction at AFRH could extend over a 10 year period. However, the intensity, duration, location, and type of construction activity would vary over time. Therefore, construction would have short-term, minor, adverse, impacts on air quality.

4.5.2.3 Indirect Impacts

No indirect impacts to air quality would occur under the Master Plan Alternatives.

4.5.2.4 Cumulative Impacts

Past, present, and future development within the Washington DC region will continue to produce additional traffic and new emission sources which would cumulatively affect air quality. Newer vehicles and building mechanical equipment operate with cleaner systems reducing the effect new sources of emissions have on air quality. The Master Plan Alternatives, when combined with past, present, and future development, would have a cumulative, long-term, moderate, adverse impact on air quality in the region. The Metropolitan Washington Region State Implementation Plan provides strategies for controlling the cumulative effects on regional air quality.

4.5.2.5 Mitigation

Short term construction impacts can be mitigated through the use of proper control measures including maintenance of emission controls on all construction equipment and covering/wetting exposed soils to reduce fugitive dust. Developers would be required to submit a construction management plan including plans to control impacts to air quality during construction.

The effects of increased NO_x emissions can be mitigated as follows:

Option 1: Incorporation of NO_x Emission Reduction into the Initial Engineering Design

By implementing Option 1, NO_x emissions controls can be incorporated into the initial engineering design in order to reduce annual PTE NO_x emissions to below the 25 ton per year *de minimus* threshold. By implementing this option, no formal general conformity determination would be required to be performed. Additionally, Alternative 4, including the total boiler capacity, would have annual PTE NO_x emissions reduced to be below 100 tons per year. As a result, Alternative 4 would no longer require that a major source NSR construction permit be obtained.

Potential NO_x emission control options include:

- Take limits on permitted hours of operation per year, and
- Incorporate NO_x control technology.

NO_x control technology options for boilers include low NO_x burners, selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) control technologies. Maximum control efficiencies expected from each technology are as follows:

- 80 percent for low NOx burners,

- 94 percent for SCR, and
- 70 percent for SNCR.

With the incorporation of any of these NO_x control technologies, annual NO_x PTE emissions for all the alternatives would be reduced to a level that is below the established 25 ton per year *de minimus* threshold and no major source NSR construction permit would be required.

Option 2: Perform a General Conformity Determination for NO_x for the selected alternative and obtain a Major Source NSR Permit (Alternative 4 Only)

If Option 1 is not chosen, annual NO_x PTE emissions would be above the 25 ton per year *de minimus* threshold so a formal conformity determination is required for the selected alternative. The same NO_x control measures as outlined in Option 1 above would need to be assessed. However, Alternative 4 annual PTE NO_x emissions show that it is also classified as a "major source" (i.e., annual PTE emission greater than 100 tons per year) under the NSR regulations. Therefore, an NSR major source construction permit would be required should Alternative 4 be selected and the NSR regulations would impose Lowest Achievable Emission Rate (LAER) control requirements for NO_x which is SCR control technology. LAER requirements do not have to consider economic feasibility, only technical feasibility of all possible NO_x control options.

4.6 Noise

4.6.1 No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, AFRH-W would maintain its current operations and no new noise sources would be created. Therefore, there would be no direct, indirect, or cumulative impacts to noise levels resulting from the No Action Alternative.

4.6.2 Proposed Action – Alternatives 2, 3A, 3B, 3C, and 4

In general, AFRH-W Master Plan Alternatives would alter traffic volumes and patterns. This noise analysis assesses the potential for those changes to exceed the District of Columbia Noise Regulations.

4.6.2.1 Direct Impacts

Noise level results for the Existing Conditions, No Action Alternative, and the five Master Plan Alternatives are presented below in Table 4-22. Receptors that would exceed the District of

Columbia Noise Regulations criteria are highlighted. The only area slightly above the NAC thresholds is the Park Place Row Homes. The remaining receptors are within the acceptable range for Category B locations.

Table 4-23. Noise Level Results

Receptor	Location	Alternatives						
		Existing	**No Action**	**2**	**3A**	**3B**	**3C**	**4**
1	Irving Street Entrance	67	67	67	68	68	68	67
2	Park Place Row Homes	68	68	68	70	70	70	68
3	Rock Creek Church Road Rowhomes	65	66	66	67	67	67	67
4	Scott Building Patio	51	53	55	54	54	54	54
5	Bandstand	61	62	62	63	63	63	63
6	Irving Street/ North Capitol Street Interchange	59	60	62	62	62	62	61
7	Rose Chapel	51	53	54	54	54	54	53
8	Rock Creek Church Road	62	63	63	64	64	64	64
9	Irving Street/Park Place Intersection	61	61	61	65	65	65	61
	Impacted receptors, according to FHWA Noise Regulations (23 CFR 772).							

Comparison of No Action and Master Plan Alternative Noise Levels

Under the No Action Alternative, AFRH-W would continue to operate at its current level of development. Although the property does not induce additional traffic volumes on study area roadways, there are traffic increases on study area roads from predicted general growth in the community. There is a one decibel noise level increase from 65 to 66 dB(A) at the residences along Rock Creek Church Road, resulting in impacted noise levels.

The Master Plan Alternatives do not result in additional noise impacts. Traffic increases resulting from development are predicted on North Capitol Street, but existing and proposed noise-sensitive areas are far enough removed from North Capitol Street to receive minor 1

decibel noise increases over the No Action condition. Therefore, the Master Plan Alternatives would have a direct, long-term, negligible, adverse impact on noise levels.

Construction Noise

Land uses that are sensitive to noise associated with increases in traffic would also be sensitive to construction noise. The extent and severity of the noise impact would depend upon the noise characteristics of the construction equipment in use and the time of day that construction takes place. As with any major construction project, areas around the construction site are likely to experience varied periods and degrees of noise impact. Therefore, construction associated with implementation of the Master Plan Alternatives would have direct, short-term, moderate, adverse impacts on noise levels.

Indirect Impacts

No indirect impacts to noise levels would occur under the Master Plan Alternatives.

Cumulative Impacts

Past, present, and future development within the Washington DC region will continue to produce additional traffic and noise sources which would cumulatively affect noise levels. The Master Plan Alternatives, when combined with past, present, and future development, would have a cumulative, long-term, minor, adverse impact on noise levels in the region.

Mitigation Measures

The following mitigation measures will be developed and enforced through transaction documents between AFRH and the developer through a construction management plan.

- All construction equipment powered by an internal combustion engine would be equipped with a properly maintained muffler.
- Air compressors would meet current U.S. EPA noise emission standards.
- New construction equipment would be used as much as possible since it is generally quieter than older equipment
- Nighttime construction activities would be minimized.
- Noise barriers around stationary noise sources would be established.
- Tools and equipment would be selected to minimize noise.

4.7 Utilities

The following section describes impacts to utilities for the No Action Alternative and for the Master Plan Alternatives.

4.7.1 Water Service

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, AFRH-W would maintain its current operations and subsequent water demand. There would be no direct, indirect, or cumulative impacts to water service systems resulting from the No Action Alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

For each of the alternatives under the Proposed Action, the increase in the estimated average daily demand and peak demand for domestic water service in the six proposed development zones was determined using flow factors established by the Washington Suburban Sanitary Commission (WSSC) for planning purposes. The proposed land uses for development space and their concurrent flow factors for each alternative are provided in Table 4-23.

Table 4-23: Domestic Water Demand Flow Factors

Development Space	Flow Factor for Determining Avg. Daily Water Demand
Institutional	Gross Square Feet x 0.093 = Gallons Per Day (GPD)
Residential	Dwelling Units x 0.178 = GPD (Assume 1,000 sq.ft./unit)
Hotel/Conference Ctr.	Gross Square Feet x 0.256 = GPD
Research & Development	Gross Square Feet x 0.167 = GPD
Retail	Gross Square Feet x 0.048 = GPD
Medical	Gross Square Feet x 0.175 = GPD
Office	Gross Square Feet x 0.093 = GPD
Embassies	Gross Square Feet x 0.093 = GPD

(Source: WSSC Water & Sewer Design Manual, 1993)

The resulting average daily demands and peak demands for each of the six proposed development zones for the alternatives are presented in Table 4-24. DC Water and Sewer

Authority (WASA) has adequate capacity to meet the water demand requirements. The water distribution system on AFRH-W would be designed to ensure adequate capacity to supply the average and peak hourly demands of the buildings on-site.

Table 4-24: Domestic Water Demand

Alternative 2			
	Gross Square Footage	**Avg. Daily Demand (Gallons/ Day)**	**Peak Demand (Gallons/ Min.)**
the AFRH Zone	**392,000**	**40,026**	**111**
Institutional	350,000	32,550	90
Residential	42,000	7,476	21
Zone A1	**5,680,000**	**794,040**	**2,205**
Hotel/Conference Center	200,000	51,200	142
Research & Development	3,200,000	534,400	1,484
Institutional	2,200,000	204,600	568
Retail	80,000	3,840	11
Zone A2 & B	**1,600,000**	**280,000**	**778**
Medical	1,600,000	280,000	778
Zone C	**1,000,000**	**171,500**	**477**
Residential	950,000	169,100	470
Retail	50,000	2,400	7
Alternative 3A			
	Gross Square Footage	**Avg. Daily Demand (Gallons/ Day)**	**Peak Demand (Gallons/ Min.)**
the AFRH Zone	**392,000**	**40,026**	**111**
Institutional	350,000	32,550	90
Residential	42,000	7,476	21
Zone A	**4,337,369**	**631,658**	**1,753**
Residential	2,346,234	417,630	1,160
Retail	243,562	11,691	32
Office/Research and Development	1,383,573	128,672	357
Hotel	123,026	31,495	87
Medical	240,974	42,170	117
Zone B	**880,000**	**156,640**	**435**
Residential	880,000	156,640	435

Zone C	**850,000**	**151,300**	**420**
Residential	850,000	151,300	420
Alternative 3B			
	Gross Square Footage	**Avg. Daily Demand (Gallons/ Day)**	**Peak Demand (Gallons/ Min.)**
the AFRH Zone	**392,000**	**40,026**	**111**
Institutional	350,000	32,550	90
Residential	42,000	7,476	21
Zone A	**4,513,554**	**729,576**	**2,058**
Residential	3,109,819	553,547	1,537
Retail	241,735	11,603	32
Office/Research and Development	692,000	64,356	179
Hotel	220,000	56,320	156
Medical	250,000	43,750	122
Zone B	**880,000**	**156,640**	**435**
Residential	880,000	156,640	435
Zone C	**850,000**	**151,300**	**420**
Residential	850,000	151,300	420
Alternative 3C			
	Gross Square Footage	**Avg. Daily Demand (Gallons/ Day)**	**Peak Demand (Gallons/ Min.)**
the AFRH Zone	**392,000**	**40,026**	**111**
Institutional	350,000	32,550	90
Residential	42,000	7,476	21
Zone A	**6,779,582**	**627,722**	**1,886**
Residential	2,517,331	448,085	1,245
Retail	470,763	22,597	63
Office/Research and Development	1,688,600	157,040	436
Hotel	200,000	51,200	142
Medical	0	0	0
Zone B	**880,000**	**156,640**	**435**
Residential	880,000	156,640	435
Zone C	**850,000**	**151,300**	**420**
Residential	850,000	151,300	420

Alternative 4			
	Gross Square Footage	**Avg. Daily Demand (Gallons/ Day)**	**Peak Demand (Gallons/ Min.)**
the AFRH Zone	**392,000**	**40,026**	**111**
Institutional	350,000	32,550	90
Residential	42,000	7,476	21
Zones A & B	**5,500,000**	**296,860**	**824**
Residential	4,500,000	60,520	168
Retail	300,000	3,840	11
Office	700,000	232,500	646
Zone C	**425,000**	**75,650**	**210**
Embassies	425,000	75,650	210

Sprinkler systems would be installed in new buildings for fire protection. It is anticipated that booster pumps would be required for the fire water system to operate sprinkler systems in the upper floors of buildings greater than four stories. To verify that sufficient fire flow is available, fire flow tests at the nearby fire hydrants would be needed to determine the actual pressures. The locations and sizes of the water supply connections would be established in conjunction with the design requirements of the various facilities.

The proposed development would require the installation of additional water transmission lines. Easements would be required for any new publicly maintained water lines. WASA administers the processing of water connections and stipulates the requirements for new water main design and utility easements.

Because development is confined to within AFRH-W campus and utility installation would be performed in coordination with new development and construction, no major impacts on pedestrian or vehicular traffic are anticipated as a result of water main installation. However, there is a possibility that water service will be affected due to water main construction on Irving Street, but it is determined that the existing 12-inch water lines onsite are in acceptable condition and maintained within acceptable easements by WASA no off-site improvements will be required. In addition, a direct, long-term, moderate adverse impact to water service is anticipated due to increased demand.

Indirect Impacts

The increase in water usage would result in the generation of wastewater that would indirectly impact sewage discharge. This impact is addressed in Section 4.7.2. Construction within Irving Street may create indirect, short-term, minor adverse impacts on traffic and pedestrian movement.

Cumulative Impacts

Past, present, and future development within the Washington DC region result in increased water demand. The Master Plan Alternatives, when combined with past, present, and future development, would have a cumulative, long-term, minor, adverse impact on water demand in the region.

Mitigation Measures

The following measures may be implemented to mitigate impacts related to water supply:

- Prepare a water conservation plan and policy.
- Install faucet aerators and low-flow toilets and shower heads.
- Design landscape plans for minimum water use (e.g., plant native, drought-tolerant species).
- Minimize use of lawns because of their high water consumption (and energy consumption and air emissions from mowers).
- When necessary, plan for water conservation in lawn maintenance (set mower blades high and water slowly at night no more than 1 inch per week with automatic, low-volume irrigation equipment).
- Use erosion and sediment controls during construction.

4.7.2 Sanitary Sewer

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, AFRH-W would maintain its current operations and subsequent wastewater flows. There would be no direct, indirect, or cumulative impacts to sanitary sewer service systems resulting from the No Action Alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

For each of the alternatives under the Proposed Action, the increase in the estimated average wastewater flow and peak wastewater flow in the six proposed development zones was determined using flow factors established by the WSSC for planning purposes. The base sanitary flow factors are the same as those used for domestic water demand; however, to attain average wastewater flow, a multiplier of 1.44 is applied to the domestic water demand to account for infiltration/inflow. The proposed land uses for development space and their concurrent flow factors for the alternatives are provided in Table 4-25.

Table 4-25: Sanitary Sewer Flow Factors

Development Space	Flow Factor for Determining Avg. Wastewater Flow
Institutional	Gross Square Feet x 0.13392 = Gallons Per Day (GPD)
Residential	Dwelling Units x 256.32 = GPD (Assume 1,000 sq.ft./unit)
Hotel/Conference Ctr.	Gross Square Feet x 0.36864 = GPD
Research & Development	Gross Square Feet x 0.24048 = GPD
Retail	Gross Square Feet x 0.06912 = GPD
Medical	Gross Square Feet x 0.252 = GPD
Office	Gross Square Feet x 0.13392 = GPD
Embassies	Gross Square Feet x 0.13392 = GPD

(Source: WSSC Water & Sewer Design Manual, 1993)

The resulting average wastewater flows and peak wastewater flows for each of the four proposed development zones for the alternatives are presented in Table 4-26.

Table 4-26: Sanitary Sewer Service Demand

Alternative 2			
	Gross Square Footage	**Avg. Wastewater Flow (Gallons/ Day)**	**Peak Wastewater Flow (Gallons/ Minute)**
the AFRH Zone	**392,000**	**57,637**	**160**
Institutional	350,000	46,872	130
Residential	42,000	10,765	30
Zone A1	**5,680,000**	**1,143,418**	**287**
Hotel/Conference Center	200,000	73,728	25
Research & Development	3,200,000	769,536	179
Institutional	2,200,000	294,624	80
Retail	80,000	5,530	3
Zone A2 & B	**1,600,000**	**403,200**	**104**
Medical	1,600,000	403,200	104
Zone C	**1,000,000**	**246,960**	**686**
Residential	950,000	243,504	676
Retail	50,000	3,456	10
Alternative 3A			
	Gross Square Footage	**Avg. Wastewater Flow (Gallons/ Day)**	**Peak Wastewater Flow (Gallons/ Minute)**
the AFRH Zone	**392,000**	**57,637**	**160**
Institutional	350,000	46,872	130
Residential	42,000	10,765	30
Zone A	**4,337,369**	**909,586**	**2,528**
Residential	2,346,234	601,386	1,671
Retail	243,562	16,835	47
Office/Research and Development	1,383,573	185,288	515
Hotel	123,026	45,352	126
Medical	240,974	60,725	169
Zone B	**880,000**	**225,562**	**627**
Residential	880,000	225,562	627
Zone C	**850,000**	**225,522**	**626**

Residential	850,000	225,522	626
Alternative 3B			
	Gross Square Footage	**Avg. Wastewater Flow (Gallons/ Day)**	**Peak Wastewater Flow (Gallons/ Minute)**
the AFRH Zone	**392,000**	**57,637**	**160**
Institutional	350,000	46,872	130
Residential	42,000	10,765	30
Zone A	**4,513,554**	**1,050,592**	**2,918**
Residential	3,109,819	797,109	2,214
Retail	241,735	16,709	46
Office/Research and Development	692,000	92,673	257
Hotel	220,000	81,101	225
Medical	250,000	63,000	175
Zone B	**880,000**	**225,562**	**627**
Residential	880,000	225,562	627
Zone C	**850,000**	**225,522**	**626**
Residential	850,000	225,522	626
Alternative 3C			
	Gross Square Footage	**Avg. Wastewater Flow (Gallons/ Day)**	**Peak Wastewater Flow (Gallons/ Minute)**
the AFRH Zone	**392,000**	**57,637**	**160**
Institutional	350,000	46,872	130
Residential	42,000	10,765	30
Zone A	**6,779,582**	**974,968**	**2,708**
Residential	2,517,331	645,242	1,792
Retail	470,763	32,539	90
Office/Research and Development	1,688,600	223,459	621
Hotel	200,000	73,728	205
Medical	0	0	0
Zone B	**880,000**	**225,562**	**627**
Residential	880,000	225,562	627
Zone C	**850,000**	**225,522**	**626**

Residential	850,000	225,522	626
Alternative 4			
	Gross Square Footage	**Avg. Wastewater Flow (Gallons/ Day)**	**Peak Wastewater Flow (Gallons/ Minute)**
the AFRH Zone	**392,000**	**57,637**	**160**
Institutional	350,000	46,872	130
Residential	42,000	10,765	30
Zones A & B	**5,500,000**	**1,267,920**	**3,522**
Residential	4,500,000	1,153,440	3,204
Retail	300,000	20,736	58
Office	700,000	93,744	260
Zone C	**425,000**	**56,916**	**158**
Embassies	425,000	56,916	158

There is currently a combined sewer system network on AFRH-W campus that could facilitate additional connections to support development activities. Although connection to a separate sewer system is preferable, there are no separate systems within a reasonable distance of proposed development. Thus, development on AFRH-W would contribute to the existing problems caused by the combined sewer system in DC. As stated in Section 3.7.2, when flows reach a certain level because of the combination of sewage and precipitation runoff, the flow is diverted to outfalls into the Potomac River and its tributaries.

The proposed development would require the installation of additional sanitary sewer lines and the acquisition of subsequent easements by WASA. WASA administers the processing of sanitary sewer connections and stipulates the requirements for sanitary sewer design and utility easements.

Because development is confined to within AFRH-W campus and utility installation would be performed in coordination with new development and construction, no major impacts on pedestrian or vehicular traffic are anticipated as a result of sanitary sewer installation. However, a direct, long-term, moderate, adverse impact to sanitary sewer service is anticipated due to the increase in service requirements.

Indirect Impacts

The additional development would result in additional wastewater load; however, there would be no significant impact on the quality or quantity of the wastewater that is ultimately discharged via the Blue Plains Wastewater Treatment Plant to the Potomac River. However, the use of combined sewer/stormwater lines would continue to increase flows in the existing system and contribute to combined sewer overflows during intense or prolonged storm events. An indirect, long-term, moderate, adverse impact could occur due to the increase in wastewater load.

Cumulative Impacts

Additional development and sewer service demand would continue to increase flows in the combined sanitary/stormwater sewer system. Additional development includes both development on AFRH-W and other development in the area. As stated in Section 3.7.2, when flows reach a certain level because of the combination of sewage and precipitation runoff, the flow is diverted to outfalls into the Potomac River and its tributaries. A long-term, moderate, adverse cumulative impact could occur due to the increase in sewer service demand.

Mitigation Measures

The following measures may be implemented to mitigate impacts related to sanitary sewer issues:

- Prepare a water conservation plan and policy.
- Install faucet aerators and low-flow toilets and shower heads.

4.7.3 Electric Service

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. There would be no direct, indirect, or cumulative impacts to electric services systems under this alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

PEPCO would provide electricity to the proposed development under the Master Plan Alternatives. The level of service anticipated for the site is substantially higher than current power utilization at the site. Implementation of AFRH-W Master Plan would require the extension of electrical power lines from existing on-site or adjacent services to new buildings and support facilities (e.g., parking areas), and new transformers within the site. In addition, the existing PEPCO vault would need to be expanded by at least 4,000 square meters to accommodate the new electric services required from the project development. Easements may be needed to provide access for PEPCO-owned lines and equipment. Direct, short-term, minor, adverse impacts to utilities or their capacity to provide services are expected. The relocation of and connection to power lines would be completed with the least amount of disruption possible to current users.

Indirect Impacts

During construction within street rights of way or public utility easements, traffic delays may occur. This would cause a negligible, adverse, short-term, indirect impact. The increased demand for electricity would have an indirect, long-term, minor, adverse impact on PEPCO.

Cumulative Impacts

Past, present, and future development in the area would place additional demands on electrical power. While PEPCO plans for regional growth, each future project would have to prepare studies to determine if supply is adequate. Therefore a long-term, minor, adverse cumulative impact from increases in service demands on PEPCO would occur.

Mitigation Measures

Energy conservation measures could be incorporated into building design to mitigate impacts related to power systems. Specific details as to the location of any new service distribution and connection would be coordinated with PEPCO.

4.7.4 Natural Gas Service

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. There would be no direct, indirect, or cumulative impacts to natural gas service systems under this alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

Natural gas would be used at AFRH-W site for heating purposes. The level of service anticipated for the site is substantially higher than current natural gas utilization at the site. Implementation of AFRH-W Master Plan would require the extension of gas lines from existing on-site or adjacent services to new buildings. Direct, short-term, minor, adverse impacts to utilities or their capacity to provide services are expected. The relocation of and connection to gas lines would be completed with the least amount of disruption possible to current users.

Indirect Impacts

During construction within street rights of way or public utility easements, traffic delays may occur. This would cause an indirect, short-term, minor, adverse impact. The increased demand for natural gas would have an indirect, long-term, minor, adverse impact on Washington Gas.

Cumulative Impacts

Past, present, and future development in the area would place additional demands on natural gas services. While Washington Gas plans for regional growth, each future project would have to prepare studies to determine if supply is adequate. Therefore a long-term, minor, adverse, cumulative impact from increases in service demands on Washington Gas would occur.

Mitigation Measures

Energy conservation measures would be incorporated into building design to mitigate impacts related to fuel and power systems. Specific details as to the location of any new service distribution and connection would be coordinated with Washington Gas.

4.7.5 Communication Service

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. There would be no direct, indirect, or cumulative impacts to communication service systems under this alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

Implementation of the Master Plan at AFRH-W would require the extension of communication lines for data and communication systems. Direct, short-term, minor, adverse impacts to Verizon or its capacity to provide services are expected. The relocation of and connection to communications lines would be completed with the least amount of disruption possible to current users. It is expected that Verizon will provide the capacity to meet the demand.

Indirect Impacts

During construction within street rights of way or public utility easements, traffic delays may occur. This would cause an indirect, short-term, negligible, adverse impact. The increased demand for communication services would have an indirect, long-term, minor, adverse impact on Verizon.

Cumulative Impacts

Past, present, and future development in the area would place additional demands on communication services. While Verizon plans for regional growth, each future project would have to prepare studies to determine if supply is adequate. Therefore a minor, adverse, long-term, cumulative impact from increases in service demands on Verizon would occur.

Mitigation Measures

Fiber optic technology could be used as much as possible to minimize the size and number of cables that would need to be constructed.

4.7.6 Solid Waste

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be implemented. Collection of solid and medical waste would continue at the existing facility. There would be no direct, indirect, or cumulative impacts to solid waste collection systems under this alternative.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct Impacts

The volume of solid waste disposed of from the site would increase during construction. Waste would be generated due to demolition of buildings on the property and disposal of construction materials. These impacts would be short-term, minor, and adverse.

During operation of the buildings on-site, solid and medical waste would also be generated. Private hauling services would dispose of the solid waste generated on-site. The amount of solid waste generated under the Master Plan Alternatives was estimated based on an average of 1.5 pounds of solid waste per employee per day and 2.7 pounds of solid waste per resident per day (Corbitt, 1990). Approximately 14.6 tons of waste per day would be generated under Alternative 2; approximately 12.5 tons would be generated under Alternative 3A; approximately 12.4 tons would be generated under Alternative 3B; approximately 13.3 tons would be generated under Alternative 3C; and approximately 12.5 tons would be generated under Alternative 4. All bio-medical waste would be collected and picked up by a service contractor for off-site disposal in accordance with DCMR Title 21. Commercial trash generators are required by law to separate recyclable refuse and deliver these materials to a recycling center. The increase in waste generated under the Master Plan Alternatives would have a direct, long-term, minor, adverse impact.

Indirect Impacts

Trash haulers would be instructed to remove construction debris from the site. Traffic, air emission, and fuel consumption associated with waste hauling would increase as a result of trash removal. However, these impacts would be temporary. After the Master Plan is implemented, no other indirect impacts associated with trash generation or disposal are expected.

Cumulative Impacts

Future development in the area would also affect solid waste generation and disposal.

Mitigation Measures

Impacts from the generation of waste can be mitigated through:

- Recycling of construction related debris
- Implementation of office recycling programs 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

4.8 Environmental Contamination

No Action Alternative

Direct, Indirect, and Cumulative Impacts

Under the No Action Alternative, the proposed Master Plan at AFRH-W would not be developed. An O&M program and other precautions should be implemented for the management of ACMs, LBP, PCBs, and other hazards in the vacant buildings. Abatement of these materials within the vacant buildings on-site would be conducted as necessary. Therefore, no direct, indirect or cumulative impacts would occur.

Proposed Action

Alternatives 2, 3A, 3B, 3C, and 4

Direct and Indirect Impacts

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

Mitigation Measures

The following mitigation measures were recommended in accordance with the Phase II ESA, and would be undertaken by AFRH:

- The oil-water separator at Building 76 should be removed if it is no longer needed.
- Existing operational UST systems at Buildings 52, 56, and 64 should be tightness tested to confirm that there are no current leaks. Inactive UST systems at Buildings 46 and 75 should be removed and properly closed. "Additional subsurface sampling should be completed at Buildings 26/27 and 74A, to evaluate the presence/absence of petroleum hydrocarbons in soil, where no closure data exists" (MACTEC, 2007). Closure documentation should be obtained and reviewed for the two tanks listed with an "undocumented closure" status (i.e., Building 26/27 and Building 74/74A). If the tanks are present, they should be abandoned in accordance with D.C. Department of the Environment and City regulations.
- The ash waste material located inside of the incinerator at Building 69 should be removed by a qualified contractor, and transported and disposed of off-site as a lead characteristic hazardous waste.
- The TPH-DRO concentrations detected at Building 76 (greater than the 100 mg/kg) should be reported to the District Department of the Environment (DDOE) UST Division as a release by AFRH. The DDOE UST Division is typically the regulatory agency responsible for managing non-UST petroleum release cases, and will likely require a Comprehensive Site Assessment. AFRH will prepare and provide this report to the DDOE Water Quality Division, to document reporting of the contaminants of concern detected in ground water at concentrations greater than either RBCs, MCLs or RBSLs. Any required investigation and remediation should be performed as directed by DDOE.

The following items were recommended in the Phase II ESA as part of AFRH-W due diligence:

- Additional assessment at Building 46 is recommended to delineate the lateral and vertical extent of naphthalene, PCE, TCE and related drycleaning solvents and to establish the actual source area. An active or passive soil-gas survey should be performed as the initial investigative task for this assessment, prior to additional soil and ground-water sampling.

- Wipe samples should be collected on the concrete floor in the Building 77 Pesticides Storage Room to confirm the presence/absence of pesticides and herbicides, if future occupancy or demolition is proposed.

- Additional subsurface soil sampling is recommended in the area of the hydraulic lifts at Building 76, to delineate the lateral and vertical extent of petroleum impact. No additional groundwater sampling is recommended, although the DDOE UST Division may require additional groundwater data. Petroleum contaminated soils that are removed from the ground at Building 76 or at other buildings at AFRH that cannot be used on site as approved fill (typically with a TPH less than 100 mg/kg), must be remediated or transported off site for treatment/disposal at a properly permitted facility.

- Although no further assessment is recommended at Buildings 48 and 78 (since the levels of detected pesticides were less than RBCs), future landholders should be advised that if greenhouses/structures at these sites are demolished, the interior soil will need to be characterized prior to disposal."

- All hazardous materials such as lead-based paint and asbestos containing materials would be properly remediated prior to demolition of buildings or building renovations.

4.9 Unavoidable Adverse Impacts

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

4.10 Relationship between Short-Term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

The long-term benefits of the proposed action would occur at the expense of short-term impacts in the vicinity of the project site. These short-term effects would occur during the period of construction, and would include localized noise and air pollution, as well as potential increased

sedimentation and erosion. However, these impacts are temporary and proper controls would be utilized to prevent these impacts from having a lasting effect on the environment.

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

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

4.11 Irreversible or Irretrievable Commitment of Resources

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

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

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

4.12 Summary of Mitigation Measures under the Preferred Alternative (Alternative 3A)

Geology, Topography, and Soils

- Soil suitability would be determined and appropriate building foundation specifications would be developed.
- A detailed erosion and sedimentation control plan would be developed prior to construction, based on the requirements of the Watershed Protection Division of the DC Department of Environment.

Water Resources

- A detailed erosion and sedimentation control plan would be developed prior to construction, based on the requirements of the Watershed Protection Division of the DC Department of Environment.

- The amount of mowed lawns would be minimized and integrated pest management techniques would be used during landscaping and turf maintenance practices to reduce the potential for altering groundwater quality.

- As required by law, on-site stormwater management controls would be provided to limit the amount of storm runoff leaving the site during a storm event and to reduce the amount of contaminants in that runoff. Stormwater quantity and quality management practices required by DCMR would ensure no increase in post-development runoff peak flow and would mitigate the impacts of increased stormwater runoff on the combined sewer system.

- Best Management Practices (BMPs) would be utilized to mitigate indirect and cumulative impacts to wetlands associated with the proposed action. Development in wetland areas is regulated by the USACE pursuant to the Clean Water Act (as implemented by 33 CFR 320-329, March 28, 2000, and 33 CFR 330, March 28, 2000). In the District of Columbia, development in wetlands or streams requires a permit from the USACE, Baltimore District issued pursuant to Section 404 (b) (1) guidelines of the Clean Water Act.

Biological Resources

- Mitigation measures for effects to vegetation and wildlife primarily consist of maintaining large green space to provide for wildlife habitat and movement corridors. Adequate amounts of forest would be retained under all the proposed action alternatives to comply with any applicable regulations.

- Revegetation of removed or damaged vegetation, as a result of construction activities, would also mitigate impacts to terrestrial biota. Careful siting of new buildings within zones noted above would help mitigate potentially adverse impacts.

Archeological Resources

- As part of the process for compliance with Section 106 of the National Historic Preservation Act (NHPA), a work plan for a Phase I Archeological Subsurface Investigation of the four zones would be prepared. The Phase I survey would be designed to identify any archeological resources with the potential to be determined NRHP eligible. If any potentially eligible archeological sites are identified, a Phase II archeological study of each site would be required to determine eligibility. If any archeological sites are determined to be eligible to the National Register, AFRH will consider avoidance or mitigation measures in consultation with the District of Columbia Historic Preservation Office (DC HPO) and other interested parties.

Historic Properties

AFRH has initiated consultation through the Section 106 process with the DCHPO and the ACHP. As a result of this consultation, a programmatic agreement is being developed that identifies mitigation measures to be implemented as well as preservation design guidelines for the defined character areas in AFRH-W. These design guidelines will be incorporated into the final AFRH-W Master Plan. Recommended possible mitigation measures include the following:

1) AFRH will retain the services of a Cultural Resources Manager (CRM) to assist AFRH in the implementation of the 2007 Historic Preservation Plan (HPP). The CRM will be retained within 12 months of NCPC's approval of the AFRH-W Master Plan.

2) AFRH will plant additional trees to replace those required for the relocation of two golf holes due to the Zone A development. Trees will be replaced on a 1-to-1 basis in accordance with AFRH Treatment Recommendations for Landscape Resources in Chapter 6 of the 2007 HPP at the time the golf holes are relocated.

3) AFRH will develop and implement a Historic Preservation Maintenance Program (HPMP) designed to identify and prioritize the maintenance needs of the contributing historic (built, natural and designed landscape, and archeological) resources. This plan will be developed and implemented within 2 years of NCPC's approval of the AFRH-W Master Plan.

4) AFRH will integrate the AFRH-W Resource Inventory/Cultural Resource Management Database into AFRH-W's proposed Computerized Maintenance Management System (CMMS) at the time the new CMMS is brought online. It is anticipated that this system will be brought on line within 2 years.

5) AFRH will develop a landscape Master Plan for the AFRH Zone and Zones B and C of the campus. This plan would be developed within one 1 year of the approval of the AFRH-W Master Plan. Implementation of the landscape Master Plan will begin within one 1 year of commencement of rent payments from the Zone A development.

6) AFRH will complete an update to an August 2007 tree survey to include Zones B and C within 1 year of commencement of rent payments from the Zone A development.

7) AFRH will complete specific landscape projects as follows:

a. Scott/Sheridan Promenade Project within 3 years from AFRH MP approval,

b. Scott Building Tree Planting Program will be completed as part of the landscape Master Plan developed in item #5 above

8) AFRH will perform a condition assessment of the historic fence along the western perimeter of the site, and perform stabilization activities. The assessment will be conducted within 2 years of the AFRH-W Master Plan approval.

Specific Actions to be Undertaken for Zone A

1) The developer for Zone A will rehabilitate and adaptively use, in conformance with the Secretary of Interior's Standards for Rehabilitation (36 C.F.R. 67) and its associated Guidelines the following buildings in Zone A:

a. Barnes Building (Building 52)

b. Forwood Building (Building 55)

c. King Hall (Building 59)

d. Viewing Stand (Building 50)

e. Bandstand (Building 49)

f. Mess Hall (Building 57)

g. Mess Hall Corridor (Building 58)

h. Hostess House (Building 53)

i. Quarters 47 (Building 47)

The developer will develop a stabilization and maintenance plan of the buildings and structures listed above no later than 120 days after the effective date of the Master Lease for Zone A. Rehabilitation for these buildings and structures listed above will commence in accordance with the Project Schedule submitted as part of the Project Plan for the first non-infrastructure phase of development.

2) The developer will rehabilitate historic landscape resources in Zone A:

a. Forwood Building Grounds to the extent grounds are located in Zone A and controlled by developer. (LaGarde and secured grounds remaining within the AFRH Zone are excluded until such time LaGarde is leased to the developer);

b. Pershing Drive Street Trees, south and east: Developer will preserve the historic orientation of Pershing Drive and shall preserve, to the maximum extent possible, the allee of trees bordering Pershing Drive. If it is not possible to save all the trees, the developer will replant trees of the same species, or, if not available, a similar species that resembles the vegetation, with the intent of restoring the historic allee;

c. Hospital Complex Quadrangle to the extent grounds are located in Zone A and controlled by developer. (LaGarde and secured grounds remaining within the AFRH Zone are excluded until such time LaGarde is leased to the developer);

d. Specimen Trees in Hospital Lawn. If it is not possible to save all trees, the developer will replant trees of the same species, or, if not available, a similar species that resembles the vegetation, in an agreed upon location within the Hospital lawn; and

e. Pasture Recreation: The developer will preserve to the maximum extent possible the orientation, unaltered topography, and configuration of the Historic Pasture in Zone A. Also, historic trees in the northwest section of the pasture will be preserved to the maximum extent possible. If it is not possible to save all trees, the developer will replant trees of the same species, or, if not available, a similar species that resembles the vegetation, in an agreed upon location within the Historic Pasture.

3) The developer will devise and implement an educational interpretation program including signage focusing on the history of AFRH and AFRH-W.

4) The Developer will complete a tree-planting program and the maintenance of historic trees in accordance with the approved AFRH-W Master Plan and local DC law.

Specific Actions to be Undertaken for Zone B

As a condition of development for Zone B, the selected developer will be required to complete the following specific mitigations:

1) Restoration of historic iron fence along the western perimeter of Zone B.

Specific Actions to be Undertaken for Zone C

As a condition of development for Zone C, the selected developer will be required to complete the following specific mitigations:

1) Restoration of the historic iron and masonry and iron fences along the western perimeter of Zone C.

2) Relocation of Community Gardens from Zone C to the AFRH Zone.

3) Undertake specific landscaping to screen Quarters 90 (Randolph Street Gatehouse, Building 90) from the northernmost development on Zone C.

Transportation

- The provision of a northbound through lane at North Capitol Street/Fort Drive and North Capitol Street/Harewood Road would make these intersections operate at LOS D during the peak hours.
- An additional westbound right turn lane at the North Capitol Street/Fort Drive intersection is recommended under the No -Action as well as the build conditions.
- The channelization island that separates the left- and right-turn lanes on the westbound approach could be reduced in size in order to provide the additional right-turn lane.
- Upstream of the channelization island, the left turn lane could be converted into a shared left/right turn lane, and the right turn movement placed under signal control.

- As part of any development agreement, AFRH-W would require a developer to prepare a transportation management plan detailing strategies to reduce single occupancy vehicle use such as shuttles to public transportation and incentives for carpools/vanpools.

Air Quality

- Short term construction impacts can be mitigated through the use of proper control measures including maintenance of emission controls on all construction equipment and covering/wetting exposed soils to reduce fugitive dust. Developers would be required to submit a construction management plan including plans to control impacts to air quality during construction.

Noise

The following mitigation measures will be developed and enforced through transaction documents between AFRH and the developer through a construction management plan.

- All construction equipment powered by an internal combustion engine would be equipped with a properly maintained muffler.
- Air compressors would meet current U.S. EPA noise emission standards.
- New construction equipment would be used as much as possible since it is generally quieter than older equipment
- Nighttime construction activities would be minimized.
- Portable noise barriers within the equipment area and around stationary noise sources would be established.
- Tools and equipment would be selected to minimize noise.

Utilities

- Prepare a water conservation plan and policy.
- Install faucet aerators and low-flow toilets and shower heads.
- Design landscape plans for minimum water use (e.g., plant native, drought-tolerant species).

- Minimize use of lawns because of their high water consumption (and energy consumption and air emissions from mowers).
- When necessary, plan for water conservation in lawn maintenance (set mower blades high and water slowly at night no more than 1 inch per week with automatic, low-volume irrigation equipment).
- Incorporate energy conservation measures into building design to mitigate impacts related to power systems.
- Recycle construction related debris
- Implement office recycling programs 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

Environmental Contamination

- The oil-water separator at Building 76 should be removed if it is no longer needed.
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- The ash waste material located inside of the incinerator at Building 69 should be removed by a qualified contractor, and transported and disposed of off-site as a lead characteristic hazardous waste.

The following items were recommended in the Phase II ESA as part of AFRH-W due diligence:

- Additional assessment at Building 46 is recommended to delineate the lateral and vertical extent of naphthalene, PCE, TCE and related drycleaning solvents and to establish the

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- Wipe samples should be collected on the concrete floor in the Building 77 Pesticides Storage Room to confirm the presence/absence of pesticides and herbicides, if future occupancy or demolition is proposed.

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