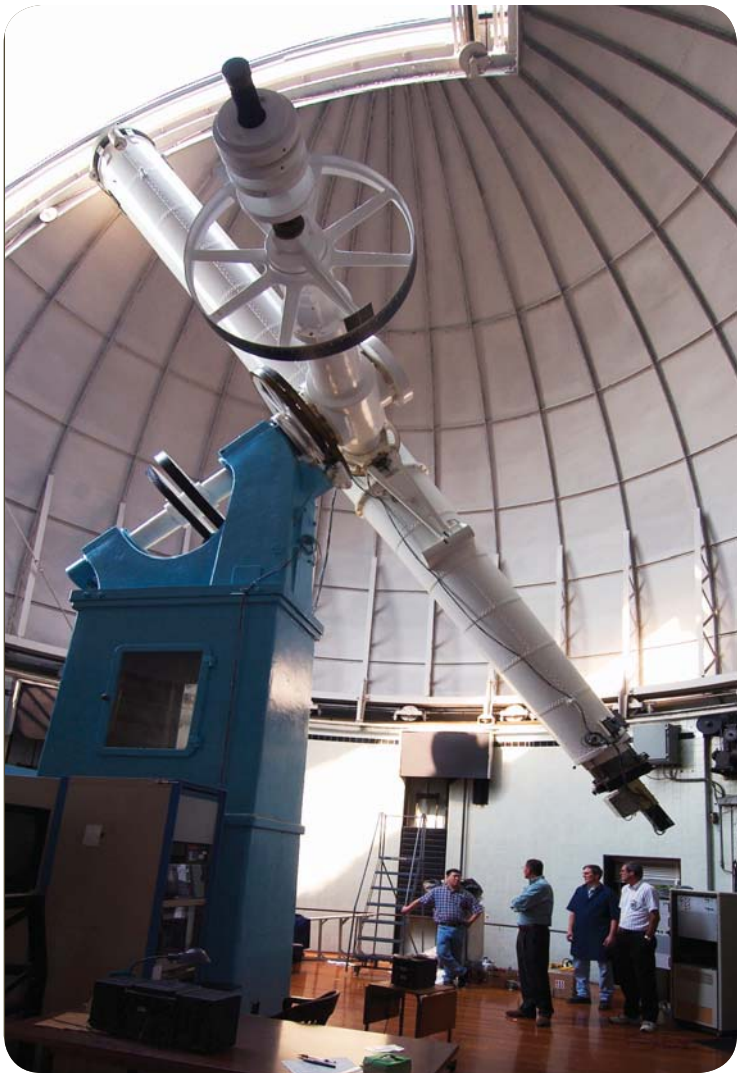
NSF Naval Observatory

Installation Master Plan

Naval District Washington

NAVAL FACILITIES ENGINEERING COMMAND

NSF Naval Observatory
Installation Master Plan



January 2014

Prepared for:

NAVFAC
Naval Facilities Engineering Command

Prepared by:

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Acronyms and Abbreviations

ARPA	Archaeological Resource Protection Act
AT/FP	Anti-terrorism/Force Protection
CCSD	Conventional Construction Standoff Distance
CFR	Code of Federal Regulations
CNO	Chief of Naval Operations
DCOP	District of Columbia Office of Planning
DCHPO	District of Columbia Historic Preservation Office
DoD	Department of Defense
EIFS	Exterior Insulation and Finish Systems
ESQD	Explosive Safety Quantity Distance
EPA	U.S. Environmental Protection Agency
FRES	Facility Readiness Evaluation Agency
ft	feet
FY	Fiscal Year
IFOM	Installation Figure of Merit
IAP	Installation Appearance Plan
ICRMP	Integrated Cultural Resource Management Plan
iNFADS	internet Navy Facilities Assets Data Store
GIS	Geographic Information System
HVAC	Heating, Ventilating, and Air Conditioning
lf	linear feet
m	meter
MILCON	Military Construction
NAVFAC	Naval Facilities Engineering Command
N/A	Not Applicable
NCPC	National Capital Planning Commission
NDW	Naval District Washington
NEPA	National Environmental Protection Agency
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NSA	Naval Support Activity
NSF	Naval Support Facility
NSV2035	Navy Shore Vision 2035
NW	Northwest
PWD	Public Works Department
RDT&E	Research, Development, Testing, and Evaluation
RIMP	Regionally Integrated Master Program
sf	square feet
UFC	Unified Facilities Criteria
USC	United States Code
USNO	United States Naval Observatory
USSS	United States Secret Service
VP	Vice President
WASA	District of Columbia Water and Sewer Authority

The 26-inch "Great Equatorial" refracting telescope is located on the grounds of NSF Naval Observatory and supports the USNO's astronomical mission.

1.0 Executive Summary

As the Navy moves into the 21st Century, efficient shore installation management must improve. Recent unprecedented employment growth is occurring resulting in the need to expand, relocate, and renovate facilities. This growth has impacts to infrastructure, buildings, environment, security, transportation, and quality of life; all of which need to be effectively managed. At first, the Naval District of Washington (NDW) developed the Regionally Integrated Master Program (RIMP), which provided broad master planning directives for the entire NDW region.

To ensure the goals of the RIMP are achieved and executed at the local-level, this installation master plan document sets the framework strategies for the efficient disposition of land and facilities. This master plan follows a unique structure and process that was developed by the Naval Facilities Engineering Command (NAVFAC) of Washington.

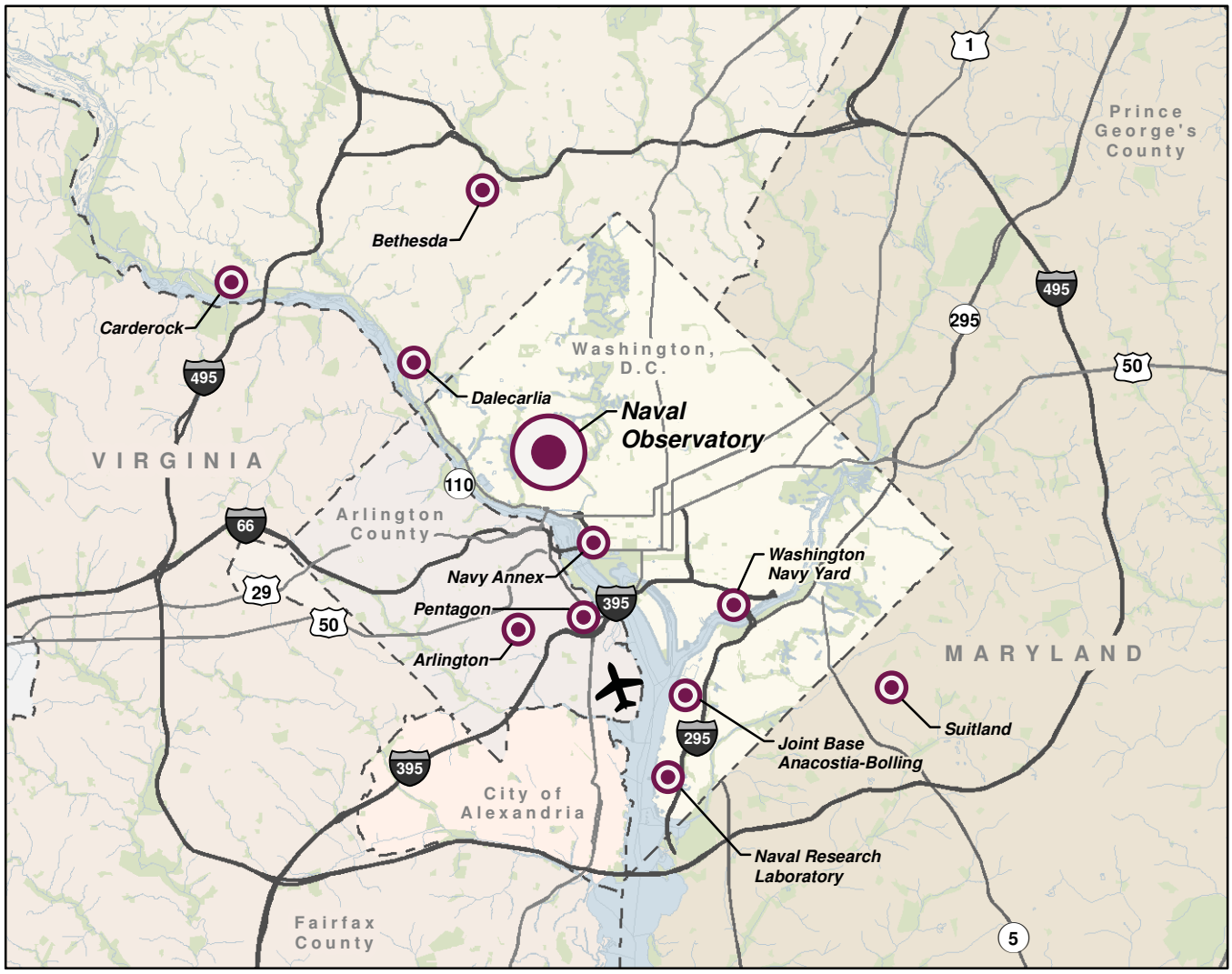
1.1 Major Tenants

Naval Support Facility (NSF) Naval Observatory supports the mission of four primary tenants:

- United States Naval Observatory (USNO)
- Oceanographer of the Navy
- United States Secret Service (USSS)
- Residence of the Vice President of the United States

Because the Residence of the Vice President of the United States is a restricted area, the master plan does not include this area in the study. Reference to facilities, infrastructure, and planning strategies for this portion of the installation is for informational purposes only. This area includes facilities used by the USSS within their internal security perimeter.

FIGURE 1-1 REGIONAL MAP



Interstate Highways
US Highways and Selected State Highways
County Boundary
Park/Green Space
Ronald Reagan National Airport
Navy Installation

N

0 1.5 3 6
Miles

Sources:
Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

1.2 Location

As depicted in Figure 1-1, NSF Naval Observatory is located in the northwestern quadrant of the District of Columbia, approximately one half mile west of Rock Creek. The property's configuration is defined by a 1,000-foot radius from the center of the Clock Vault, which was situated at the center of Observatory Circle to provide maximum insulation from noise and vibration.

The 72-acre Installation is surrounded by densely populated Washington, D.C., neighborhoods, with Woodley Park to the east, Georgetown to the south, Glover Park to the west, and the National Cathedral to the north. To the east, the Installation is bordered by Massachusetts Avenue, a major thoroughfare. NSF Naval Observatory is located amid numerous embassies, with the Embassy of the United Kingdom, the Embassy of New Zealand, and the Embassy of China located adjacent to the Installation.

1.3 Vision and Guiding Principles

The Naval Support Facility (NSF) Naval Observatory is envisioned as a principal center for research, development, testing, and evaluation (RDT&E) set in a unique natural environment within Washington, D.C.

This NSF Naval Observatory Master Plan will guide the framework of sustainable facilities, amenities, and services that supports the execution of the tenant missions within an urban atmosphere.

The vision statement provides an over-arching image that the Navy wishes to achieve for its installation. This image of the future state is captured within ten guiding principles that provide strategies to achieve the vision. The guiding principles were derived from stakeholder input and extracted from regulatory guidance. They include:

- Compact Development
- Infill Development
- Circulation Networks
- Horizontal Development
- Vertical Development
- Sustainable Landscape Elements
- Low Impact Development and Stormwater Management
- Configuration and Utilization
- Energy Conservation and Production
- Lifecycle/Mitigation Planning

TABLE 1-1 FACILITY ASSETS

Facility No.	Name	Area (sf)	Stories
1	ADMINISTRATION BUILDING	52,422	5
2	EQUATORIAL 26-INCH TELESCOPE HOUSE	5,948	1
3	OBSERVERS ELECTRONIC LAB	3,259	1
8	ADMINISTRATION BUILDING	2,814	1
16	BOILER HOUSE/COMPCTR/1967	10,535	3
19	USSS ADMINISTRATION BUILDING	16,889	2
25	PORTABLE TRANSIT HOUSE	137	1
34	VP GROUND MAINTENANCE SHED	230	1
35	VP GROUND MAINTENANCE SHED	48	1
36	USSS STORAGE SHED	100	1
37	EMERGENCY GENERATOR BUILDING	624	1
39	24-INCH EQUATORIAL TELESCOPE BUILDING	2,117	2
43	QUARTERS D GARAGE	460	1
44	NOB QTRS B&C GARAGE	395	1
50	ATOMIC CLOCK	5,349	1
52	ADMINISTRATION BUILDING	49,922	3
54	STANDBY GENERATOR BUILDING	400	1
56	ADMINISTRATION BUILDING	40,953	2
59	ADMIN/CAFETERIA	5,117	1
61	TRANSIENT OBSERVERS HOUSE	770	1
62	GARAGE ANNEX	1,224	1
75	PWD BUILDING	1,025	1
76	GROUNDS EQUIPMENT BUILDING	1,025	1
77	AC FACILITY (50 TC)	441	1
78	SIMON NEWCOMB LABORATORY	10,986	2
82	TECHNICAL EQUIPMENT BUILDING	986	2
83	EMERGENCY GENERATOR BUILDING	1,809	1
87	TELESCOPE BUILDING	158	1
92	GATEHOUSE BUILDING	55	1
93	GATEHOUSE BUILDING	48	1
94	GATE HOUSE	60	1
95	MORGAN LN HAZ WAST STORAGE	720	1
97	34TH GUARDHOUSE(MAIN GATE)	550	1
99	CARPORT	434	1
149	SALT STORAGE FACILITY	945	1
52A	DATA PROCESSING CENTER	11,625	3
A8	34TH & MASS AVE NW	80	1
B C	NOB QTRS B&C F&GOQ	10,400	4
B70	USSS GARAGE 1	1,920	1
B71	USSS GARAGE	5,327	1
D	NOB QTRS D F&GOQ	4,700	3
F	NOB QTRS F F&GOQ	3,258	2
F1	QUARTERS F GARAGE	541	1
F2	QUARTERS F STORAGE SHED	141	1
	Total	256,949	N/A

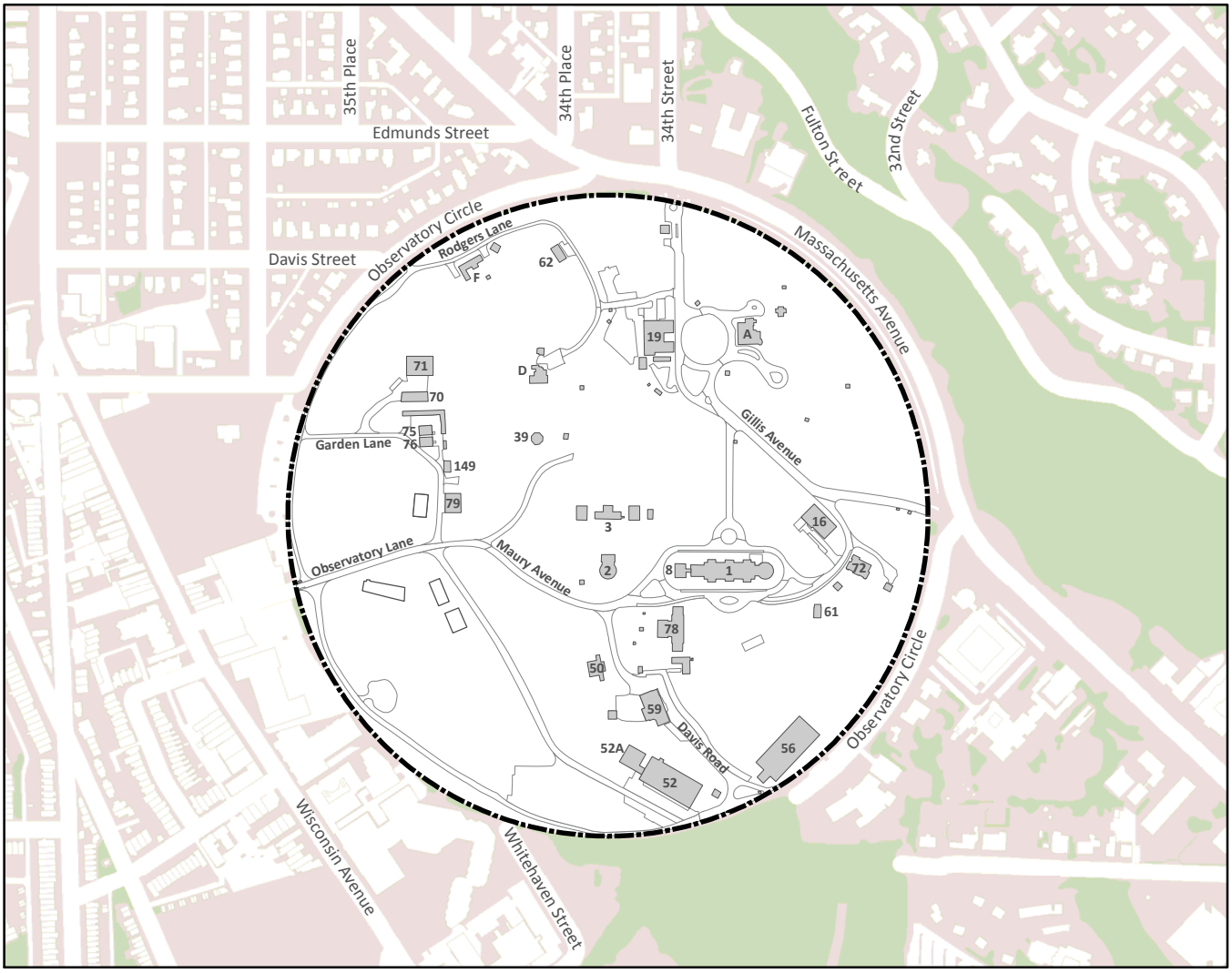
Source: NAVFAC Washington iNFADs, 2011.

1.4 Existing Facility Assets

- The average building age is 63 years old.
- Most of the facilities are focused on research and development, supporting USNO's missions.
- Eighteen structures on the Installation are either eligible for listing on the National Register of Historic Places (NRHP) or contribute to the Naval Observatory Historic District.
- Four residential quarters are located in the northern section of the Installation.

Table 1-1 and Figure 1-2 shows the various buildings that currently exist on NSF Naval Observatory and their size.

FIGURE 1-2 EXISTING FACILITY ASSETS



Installation Boundary

N

0 200 400 800

Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

1.5 Population and Parking Program

Summary

The following information summarizes existing and future conditions for NSF Naval Observatory:

Existing

- Land Area: 72.10 acres
- Installation population: 314
- Building Floor Area: approximately 257,000 square feet.
- Total Parking: 313 parking spaces (not including Vice President Residence/USSS)
- Comprised of 9 land use areas, with Research, Development, Test and Evaluation; Open Space/ Preservation and Family/Bachelor Housing as the primary land uses.

Future

- Land Area: 72.10 acres
- Installation population: 314
- Building Floor Area: approximately 262,000 square feet (with programmed construction)
- Total Parking: 313 parking spaces (not including Vice President Residence/USSS)
- No changes in land use.

TABLE 1-2 POPULATION AND PARKING

Year	Population	Parking	Pop:Parking Ratio
NSF Naval Observatory			
Existing	314	313	1 : 1.00
5-year Outlook	314	313	1 : 1.00

Source: Naval Facilities Command (NAVFAC) Washington, 2012.

To determine population growth expected at NSF Naval Observatory, data was collected from interviews and workshops with stakeholders and tenant organizations, available Navy funding for new construction and personnel projections, and installation reports and studies. The installation is divided into two areas: NSF Naval Observatory, and the Residence of the Vice President of the United States. This master plan is for the Naval Observatory portions of the installation. Any reference to Residence of the Vice President and its associated United States Secret Service (USSS) is for informational purposes only.

- **NSF Naval Observatory:** the total population of 314 will not increase over the five-year time frame of this master plan due to no mission changes.

Content intentionally omitted

The National Capital Planning Commission's (NCPC) Comprehensive Plan entails parking requirements and goals for federal agencies. NSF Naval Observatory's parking ratio requirement is one parking space for every four employees because of the Installation's location within the historic boundaries of Washington, D.C.

NSF Naval Observatory has a total of 313 employee parking spaces, which will remain constant through the timeframe of this master plan. This is due to funding restrictions that are in effect for the foreseeable future which impact the level of mission growth and future changes to real property. This results in a parking ratio that will not meet NCPC's requirement. However, during the long-term outlook, changes in mission and parking quantities can bring the installation closer to NCPC's ratio goal of 1:4

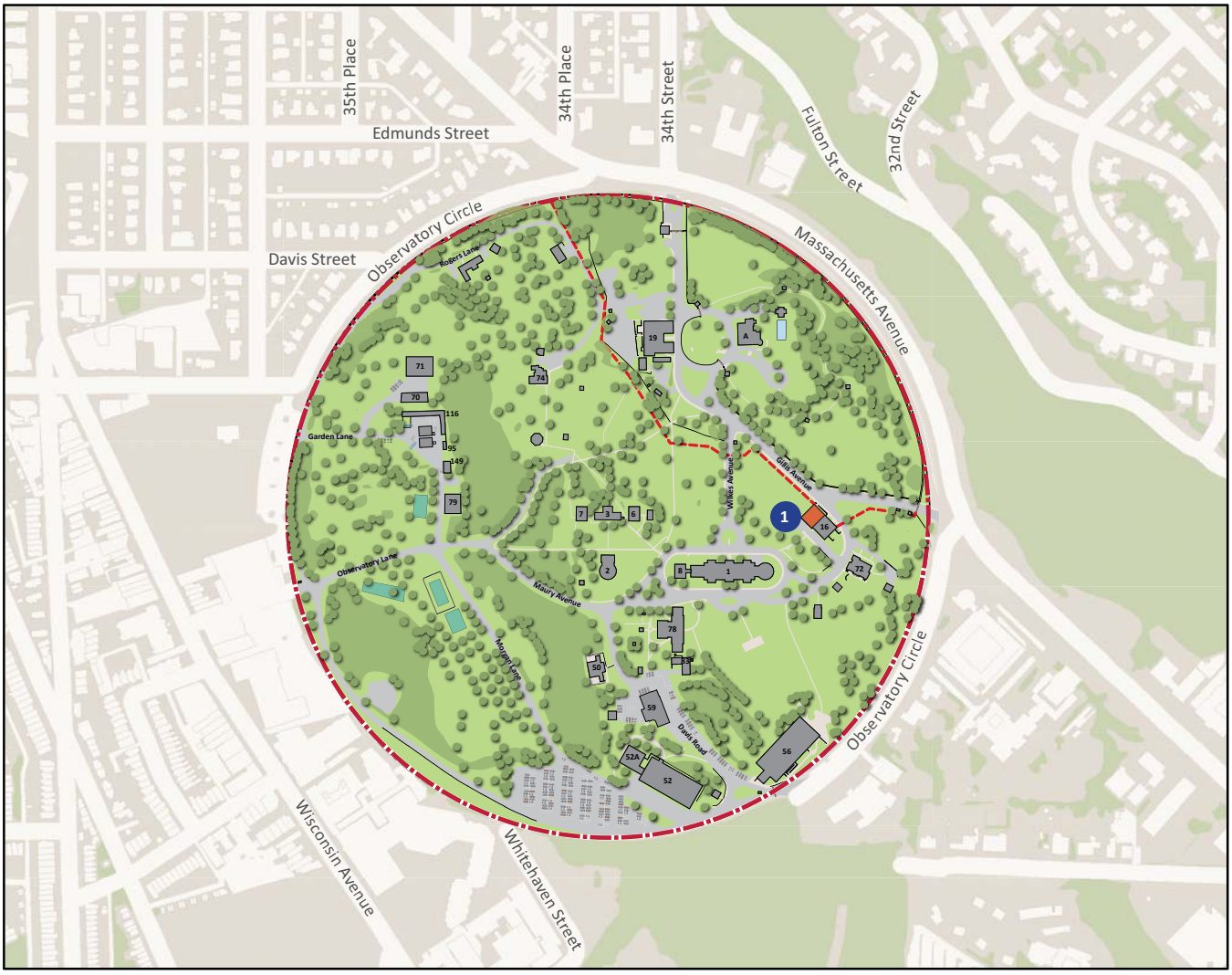
One project is planned for the NSF Naval Observatory Master Plan over the next five years. The USSS needs additional administrative office space and is planning to expand Building 16 by FY 2017 (Table 1-3 and Figure 1-3). Although this is project is within the Vice Presidential compound and is not in the purview of this master plan, it is being included here for informational purposes.

TABLE 1-3 PROGRAMMED PROJECT

Program	Project Area	Location	Square Foot Addition
Addition	1	Building 16	5,000

Source: 1391s and NAVFAC Washington, 2012.

FIGURE 1-3 PROGRAM PROJECT



- Installation Boundary
- Water
- Road
- Parking
- Existing Sidewalk
- Fence
- Athletic Court
- Green Area
- Trees
- Existing Building
- Renovation Project
- Residence of the Vice President of the United States Fence

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

1.6 Future Land Use and Framework Plans

Future Land Use Plan

Within the five-year time frame of this master plan, no changes to the land uses are planned, and all land uses will remain the same in terms of delineation and area. Table 1-4 compares the existing and future land use acreages shown in Figures 1-4 and 1-5.

TABLE 1-4 COMPARISON OF EXISTING AND FUTURE LAND USES

	Existing		Future	
Land Use	Total Acreage	% of Total	Total Acreage	% of Total
Base Support	9.27	14	9.27	14
Family/Bachelor Housing	16.85	23	16.85	23
Open Space/ Preservation	17.98	25	17.98	25
Parking	3.20	4	3.20	4
RDT&E	18.88	26	18.88	26
Recreation	2.43	3	2.43	3
Storage	3.19	4	3.19	4
Temporary Lodging	.40	1	.40	1
Total	72.20	100	72.20	100

Source: NAVFAC Washington in conjunction with EMA, 2008; Washington, D.C., GIS, 2008; ESRI StreetMap USA, 2005; iNFADS, 2009; FRES, 2009.

FIGURE 1-4 EXISTING LAND USE PLAN

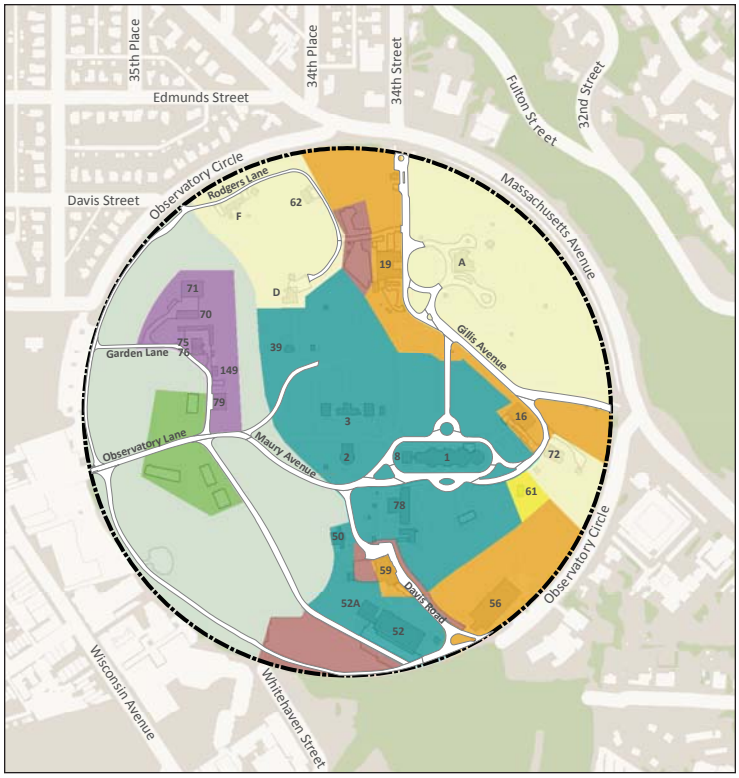
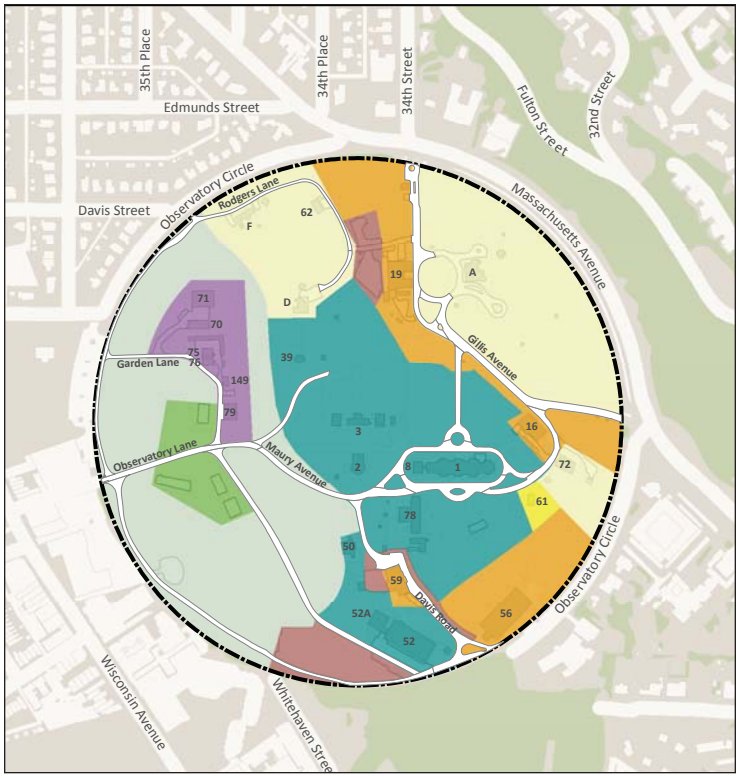
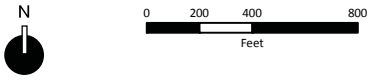


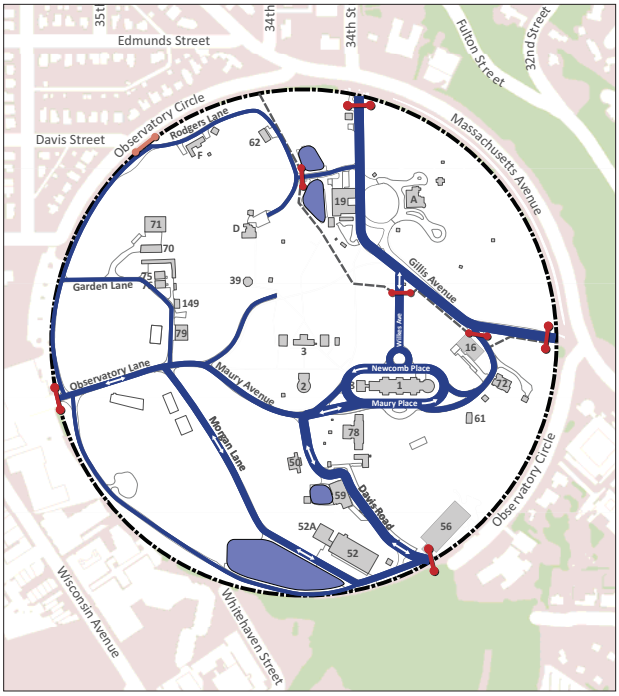
FIGURE 1-5 FUTURE LAND USE PLAN





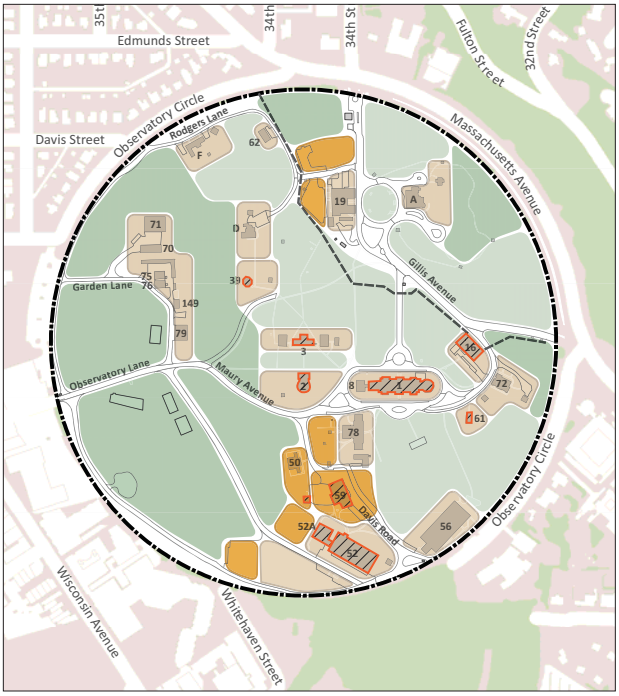
Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

FIGURE 1-6 FUTURE ROADWAY CIRCULATION AND PARKING STRATEGIES PLAN



Strategies for roads and parking placement ensure an easy means of navigating through the installation and consolidating parking to reduce impervious surface lots.

FIGURE 1-7 FUTURE DEVELOPMENT PARCELS STRATEGIES PLAN



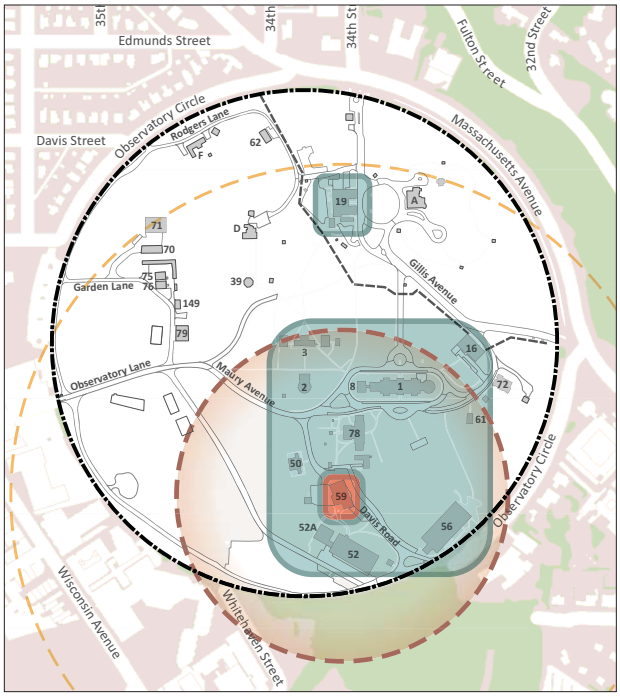
Strategies for development parcels identify areas for redevelopment/ infill, renovation/retrofitting, or open space.

Framework Plan

Planning strategies are the basis of the future plan for the installation. They take the issues mandated by the guiding principles and give physical form to those objectives. The planning strategies presented in this section focus on major infrastructure and planning systems to develop the framework plan, and include:

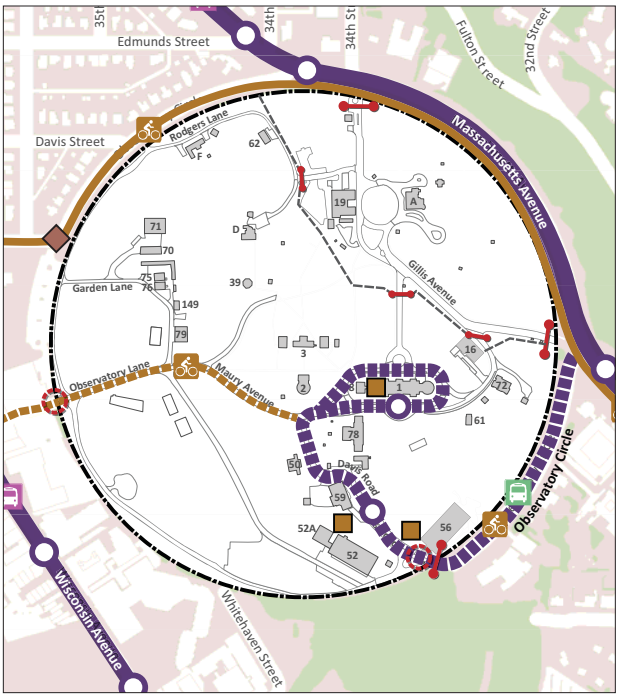
- **Roadway Circulation and Parking:** directs strategies for how the system of roads and parking take form (Figure 1-6).
- **Development Parcels**: directs where future development can and cannot occur by indicating which land parcels or facilities can be repurposed or redeveloped (Figure 1-7).
- **Activity Hubs:** directs where the majority of personnel are to be located and their available access to social amenities (Figure 1-8).
- **Multimodal Circulation:** directs how alternative means of transportation can be implemented to reduce the dependency on single-occupancy vehicle trips (Figure 1-9).
- **Open Space and Pedestrian Circulation:** directs how to preserve existing open spaces and the pedestrian connections that make the Installation a walkable place (Figure 1-10).
- **Security Enhancements**: directs the needs for AT/FP while dealing with realities of existing facilities (Figure 1-11).
- **Energy**: directs strategies for renewable energy production and reduction in energy consumption (Figure 1-12).
- **Stormwater Management**: directs strategies for stormwater management across the installation (Figure 1-13).

FIGURE 1-8 FUTURE ACTIVITY HUBS STRATEGIES PLAN



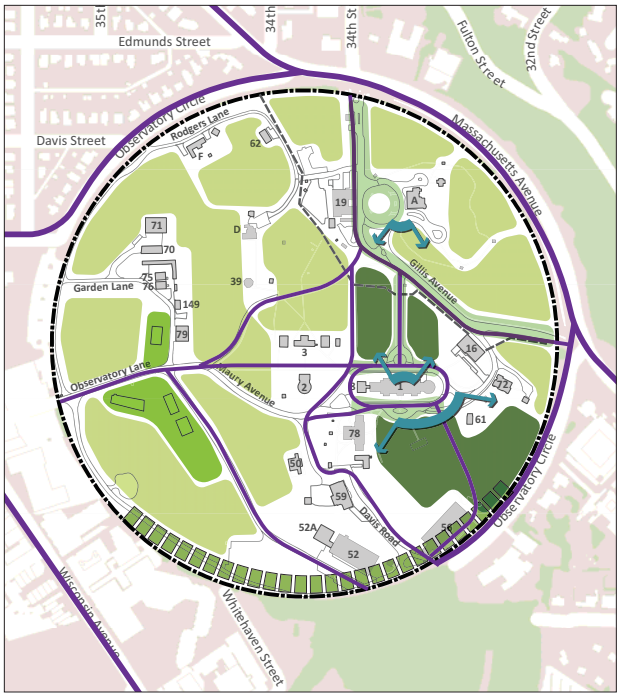
Activity hubs identify areas of concentrated administrative office functions (blue areas) and community support facilities (red areas) to ensure each is within easy walking distance.

FIGURE 1-9 FUTURE MULTIMODAL CIRCULATION STRATEGIES PLAN



Strategies for a multi-modal network designate installation routes for various transit systems to connect with regional services.

FIGURE 1-10 FUTURE OPEN SPACE AND PEDESTRIAN CIRCULATION STRATEGIES PLAN

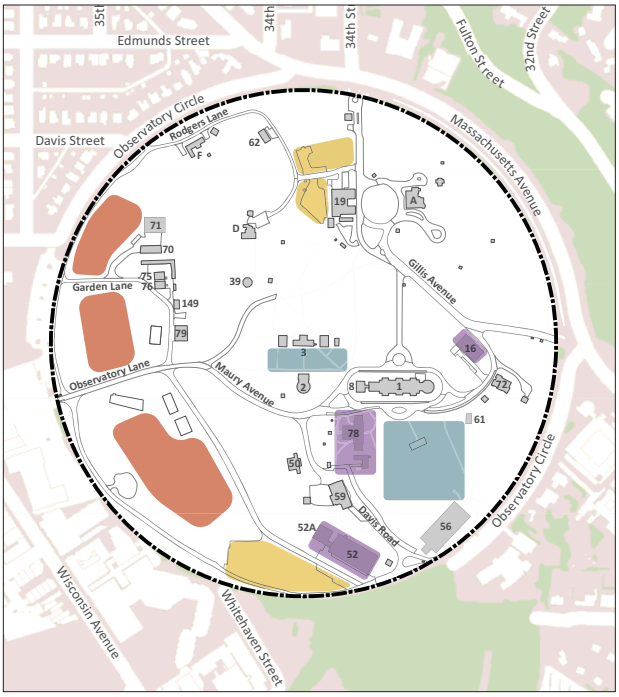


Open space and pedestrian circulation strategies plan for a complete network of walkways that connect people to facilities and outdoor spaces.

FIGURE 1-11 FUTURE SECURITY ENHANCEMENTS STRATEGIES PLAN

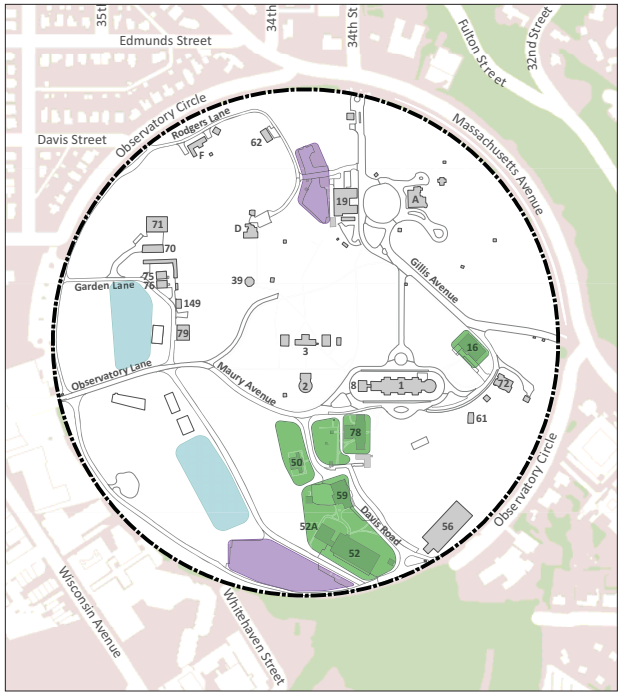
Image intentionally omitted

FIGURE 1-12 FUTURE ENERGY STRATEGIES PLAN



Strategies for energy include locating opportunity areas for solar, wind, and geothermal power production as well as buildings that can incorporate innovative sustainable systems in new construction and renovation.

FIGURE 1-13 FUTURE STORMWATER MANAGEMENT STRATEGIES PLAN



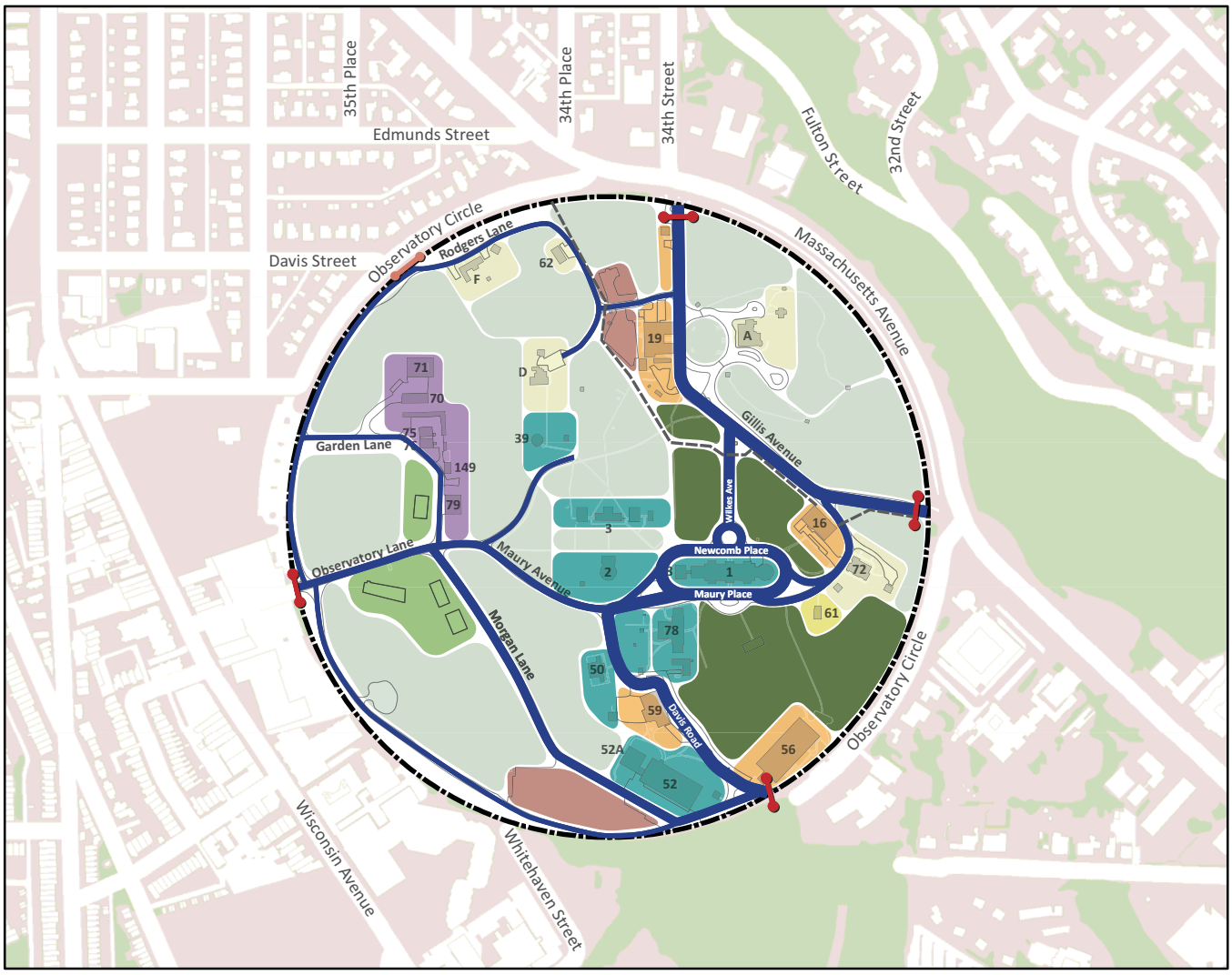
Strategies for stormwater management identify areas suitable for bioretention, green roofs, pervious pavement, and underground retention systems.

The guiding principles listed previously were used to measure each of the planning strategies to ensure that future plans would meet the needs and wants of the stakeholders. This analysis is illustrated in Chapter 4.

These networks combine with the land use plan to create the future framework plan (Figure 1-14) that provides a broad vision of development without being locked into a specific program beyond the five-year project list. The future framework plan:

- Accommodates growth 5 years out in existing facilities, although the population is expected to remain stable.
- Can absorb unanticipated growth into existing facilities through adaptive reuse of the facility in question.
- Maintains the lower density development characteristic of the Installation.
- Maintains the arrangement of existing facilities and streets; thereby, preserving the campus setting and pedestrian walkability.
- Promotes multimodal connections to regional mass transit, bicycle routes, and pedestrian walkways/trails.
- Preserves existing open space, ceremonial areas, and forests to support USNO's astronomical missions.
- Reserves parcels for development that may occur in the future, beyond the scope of this master plan.
- Although not under the purview of this master plan, the future framework plan does show areas for additional administrative space necessary for the USSS to complete their mission.

FIGURE 1-14 FUTURE FRAMEWORK PLAN



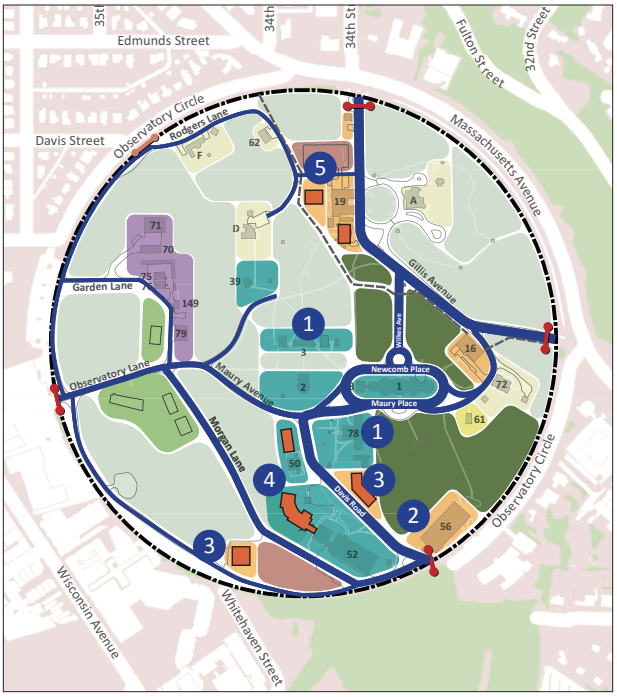
- Installation Boundary
- Base Support Parcels
- Family/Bachelor Housing Parcels
- Open Space/Preservation Parcels
- Parking Parcels
- RDT&E Parcels
- Recreation Parcels
- Storage Parcels
- Temporary Lodging Parcels
- Ceremonial Green Space
- Roads
- Operational Gates
- Closed Gate
- Residence of the Vice President of the United States Fence

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

FIGURE 1-15 LONG-TERM FRAMEWORK PLAN



Although this NSF Naval Observatory Master Plan extends only five years into the future, there are several planning issues to consider for the installation in the long term, up to 20 years out. These issues include internal improvements to infrastructure, environmental sustainability and encroachment.

The issues and planning strategies presented here will not necessarily be happening within the scope of this NSF Naval Observatory Master Plan. Nevertheless, these important issues are at the forefront of planning, and they are summarily briefed here to acknowledge these trends and offer suggestions for further study and consideration.

1. Renovate existing facilities that can still serve as viable facilities for similar or new uses (Buildings 3 and 78).
2. Backfill buildings that have vacant space that can be repurposed for similar or new uses (Building 56).
3. Consider demolishing Building 59 and relocating the support functions. The demolition/relocation can allow for the realignment of Davis Road for better traffic circulation. Police/Security function could move to the eastern portion of South Lot. Food service could move to the east side of a realigned Davis Road.
4. The new site for RDT&E is adjacent to other similar facilities and maintains a compact clustered arrangement of buildings.
5. Although not in the purview of this master plan, the USSS facilities could consolidate surface parking to the north of Building 19. This would provide land immediately adjacent to the Building 19 that would allow future structures to maintain a compact cluster.

2.0 Introduction

2.1 Purpose

As the Navy moves into the 21st Century, efficient shore installation management must improve. Recent unprecedented employment growth for the region has resulted in the expansion, relocation, and renovation of facilities and infrastructure. This growth has impacts to mission, environment, security, transportation, and quality of life; all of which need to be effectively managed. At first, the Naval District of Washington (NDW) developed the Regionally Integrated Master Program (RIMP), which provided broad master planning directives for the entire NDW region. The RIMP consists of four planning documents:

- Existing Conditions Report
- Existing Constraints Report
- Proposed Land Use Report
- Land Use Analysis Report

To ensure the goals of the RIMP are achieved and executed at the local-level, this installation master plan document sets the framework strategies for the efficient disposition of land and facilities. This master plan follows a unique structure and process that was developed by the Naval Facilities Engineering Command (NAVFAC) of Washington. This ensured compliance in regards to:

- The RIMP processes and procedures.
- Consistency between that various NDW installations.
- Meeting specific NAVFAC requirements.

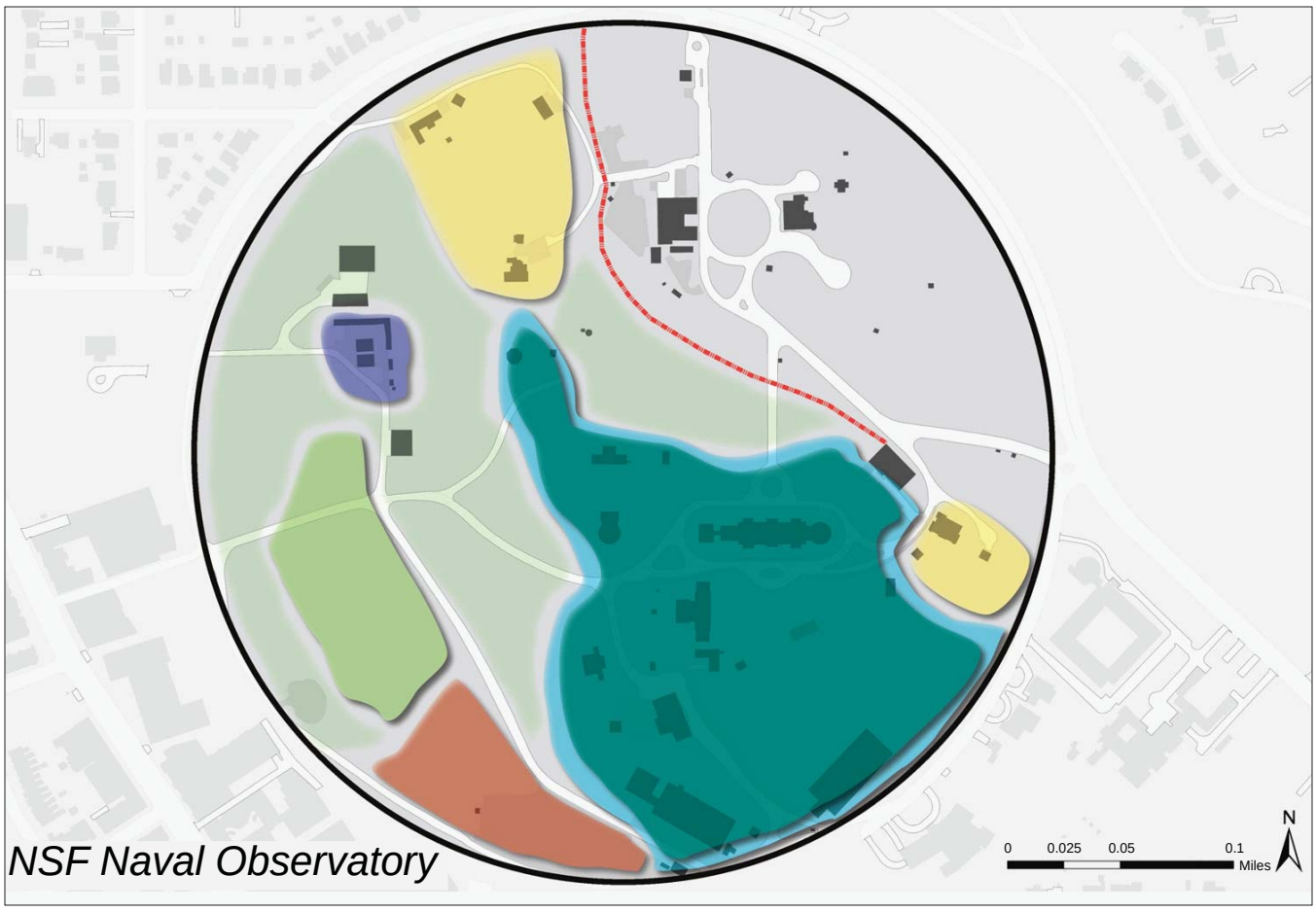
The RIMP planning documents provide conceptual regional land use recommendations to 2035. To ensure that the goals of the RIMP are achieved and executed at the installation level, this NSF Naval Observatory Master Plan builds upon and adapts the RIMP's regional land use recommendations and provides an Installation-specific framework while enhancing and redefining a singular vision and program for NSF Naval Observatory's mission and goals.

The ability to implement the long-term goals of the RIMP can be impacted by several factors beyond NDW's control: these include the Department of Defense (DoD) mission and realignment [i.e., Base Realignment and Closure (BRAC)], tenant mission growth and movement, and funding. This NSF Naval Observatory Master Plan comprehensively focuses on executable projects as they relate to installation facilities, utilities, transportation, land use, and the environment.

This NSF Naval Observatory Master Plan presents information in three broad topics:

- **Evaluation of Existing Conditions:** Takes inventory of the current state of the installation and its immediate surroundings. Understanding the context helps inform the best approaches toward a desirable future.
- **Presentation of the Master Plan Program:** Explains the population and facility projections that will be expected to accommodate future growth and expansion.
- **Explanation of Implementation:** Presents strategies for achieving the long-range vision while enhancing the Installation and the quality of life for those working and residing at NSF Naval Observatory.

FIGURE 2-1 RIMP 2.0 MODEL BASE



Source: NDW RIMP 2.0, June 2010

Family & Bachelor Housing
Temporary Lodging
Recreational Uses
Training
Utilities
Storage
Industrial Complex
Town Center
Parking
Mission Cluster
Mission Complex
Open Space/ Preservation
Restricted Area

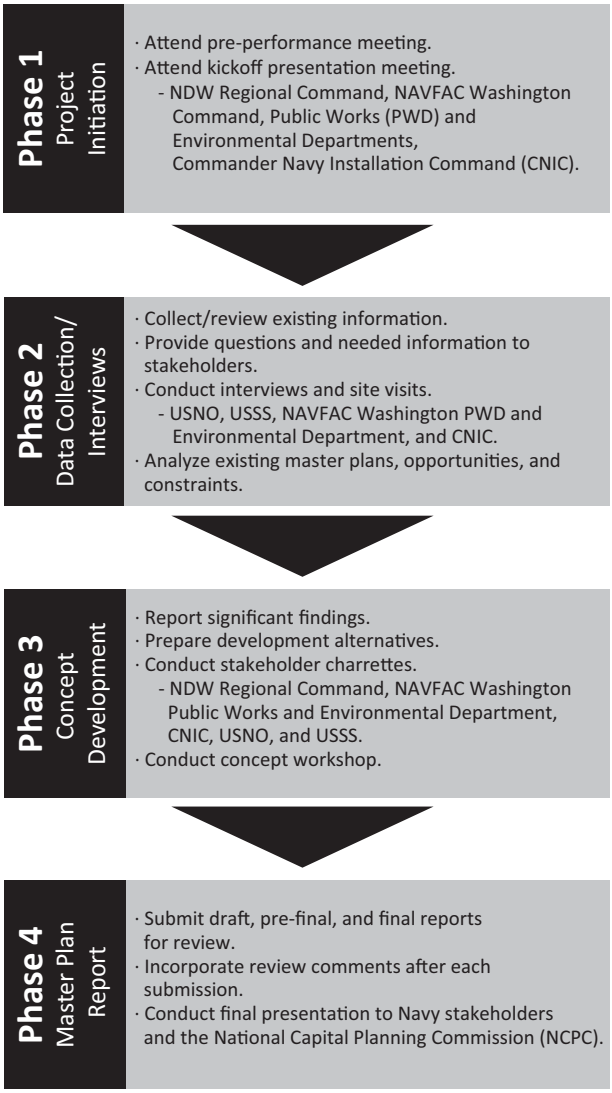
Background

Operating Site
Existing Facilities
Water
Surrounding Area

2.2 Methodology

Figure 2-2 shows the four-phase master planning methodology used to create this NSF Naval Observatory Master Plan. Input from all installation tenants and commands through the interview process and planning charrettes was used to determine future personnel and project needs and define the ideal development principles for maximizing installation capabilities.

FIGURE 2-2 MASTER PLANNING METHODOLOGY



2.3 Master Plan Vision and Guiding Principles

The vision and guiding principles provide the over-arching directive for this NSF Naval Observatory Master Plan. They serve as objective measurements to ensure the NSF Naval Observatory Master Plan is achieving the desired long-term intentions for an efficient and effective Installation that offers a high quality of life for its population.

Vision Statement

The NSF Naval Observatory is envisioned as a principal center for research, development, testing, and evaluation set in a unique natural environment within Washington, D.C.

This NSF Naval Observatory Master Plan will guide the framework of sustainable facilities, amenities, and services that supports the execution of the tenant missions within an urban atmosphere.

Guiding Principles

Guiding principles provide the instructive direction for the future of NSF Naval Observatory. With input from installation stakeholders and adherence to regulatory guidance, a list of ten principles was developed. These principles give the over-arching goals that the master plan should strive to achieve. Under each goal are a set of objectives that provide measurable planning actions by which to evaluate the master plan. The guiding principles include:

Compact Development

- Limit new construction within areas already serviced by infrastructure.
- Direct the patterns of infrastructure and facilities into densely configured grids or clusters.
- Minimize distances between buildings and strive for minimal security setbacks.
- Consider pedestrian access and walking distances in determining appropriate densities for development.

Infill Development

- Encourage future development within the gaps of existing development.
- Encourage redevelopment of aging facilities that are past their life-cycle expectancy.
- Encourage long-term development on surface parking lots when feasible.

Circulation Networks

- Focus development around transit hubs.
- Locate transit stops within walking distance of each other.
- Create an interconnected multi-modal transit network.
- Separate vehicles when feasible from pedestrian or sensitive mission activity.
- Facilitate ingress and egress at the gates.
- Maximize existing infrastructure to accommodate vehicles, pedestrians and bikes.
- Ensure all circulation networks are continuous and provide access to all essential areas.
- Establish a way-finding system to identify transit and encourage its use.
- Implement a parking strategy that adheres to local regulations and the National Capital Planning Commission (NCPC) parking ratio.

Horizontal Development

- Integrate a mix of compatible uses that share infrastructure and users.
- Create pedestrian-oriented spaces.
- Preserve land for future growth and unanticipated mission requirements.
- Preserve historic landmarks and districts.
- Address encroachment issues between the installation and its surrounding that have a negative impact.

Vertical Development

- Locate compatible uses within the same building.
- Mandate multi-story construction that reduces mission footprint.
- Encourage multi-story parking structures to reduce the amount of surface lots.

Sustainable Landscape Elements

- Increase the amount of vegetation to the extent possible to benefit environmental and aesthetic conditions.
- Preserve existing vegetation and habitat to the extent possible.
- Utilize plantings to improve view sheds, and cultural resources.
- Provide enhancements to public places for recreation and gathering.
- Ensure that landscaping and site improvements support AT/FP measures.

Low Impact Development and Stormwater Management

- Preserve natural features that can be utilized for stormwater management.
- Consolidate surface parking to reduce impervious surface and land consumption.
- Use pervious pavements where feasible.
- Reduce the amount of sprawl and maintain compact development.
- Minimize street widths while maintaining adequate fire protection access.
- Reserve areas for stormwater management systems, and utilize innovative technologies if site conditions are constrained.
- Limit encroachment into constrained areas.

Configuration and Utilization

- Configure buildings and infrastructure properly to meet mission needs.
- Encourage building widths that allow adequate indoor daylighting.
- Optimize existing buildings, infrastructure, and/or land to accommodate new mission requirements.
- Adapt historic structures to accommodate new uses.

Energy Conservation and Production

- Locate areas for renewable energy production and/or distribution facilities when feasible.
- Establish centralized energy plants to distribute hot water, chilled water, and steam to clustered development areas.
- Designate green energy production systems on available open spaces, parking lots, or roof tops.
- Enable personnel and mission tenants the means to conserve energy and resources.

Lifecycle/Mitigation Planning

- Implement highest quality and highest capacity construction to ensure longest life cycle and return on investment, and quality of life.
- Encourage new development as a catalyst for infrastructure improvement.
- Avoid impacts to constraints when feasible to avoid mitigation costs.
- Consider property values as a catalyst to maximize its mission use.

2.4 Installation Mission, Functions, and Responsibilities

The NSF Naval Observatory supports the missions of its tenants, which include the U.S. Naval Observatory (USNO), Oceanographer of the Navy, USSS, and Residence of the Vice President of the United States.

The USNO performs an essential scientific role for the Navy, the DoD, and the nation. Its mission includes determining the positions and motions of the earth, sun, moon, planets, stars and other celestial objects; providing astronomical reference data; measuring the earth's rotation and orientation; determining precise time, and maintaining the master clock for the United States. The USNO's scientists make observations, formulate theories, and conduct the research necessary to carry out these mission goals. These astronomical and timing data are essential for accurate navigation and the support of secure digital communications on Earth and in space.

NSF Naval Observatory is also home to one of the world's leading astronomical libraries. The James M. Gilliss Library contains more than 85,000 volumes. In addition to its extensive holdings of current scientific publications, the library also serves as an archive for many rare books and periodicals dating back to the fifteenth century.

The mission of the Oceanographer of the Navy is to provide naval, joint, and coalition warfighters environmental understanding of the air, surface, and subsurface maritime battlespace to ensure safety and readiness for unencumbered global operations.

The mission of the USSS is to safeguard the nation's financial infrastructure and payment systems to preserve the integrity of the economy and to protect national leaders, visiting heads of state and government, designated sites, and national special security events.

The official home of the vice president is also located at NSF Naval Observatory. The house was built in 1893 and was initially intended for the USNO superintendent. Vice presidents have lived at the home since 1973.

Historically, Building 1 served as the original observatory. Today the facility houses the administrative offices of the United States Naval Observatory (USNO).

Source: USNO.

The USNO operates two master clock facilities. The primary facility is on NSF Naval Observatory.

Source: http://www.flickr.com/photos/drapes68/5702709839/.

Future development shall maintain the naturalized setting of NSF Naval Observatory to be in alignment with the guiding principles.

USNO personnel prepare the facility's historic 26-inch refractor telescope for optical viewing of Mars.
Source: www.navy.mil.

The James M. Gilliss Library is one of the world's leading astronomical libraries.

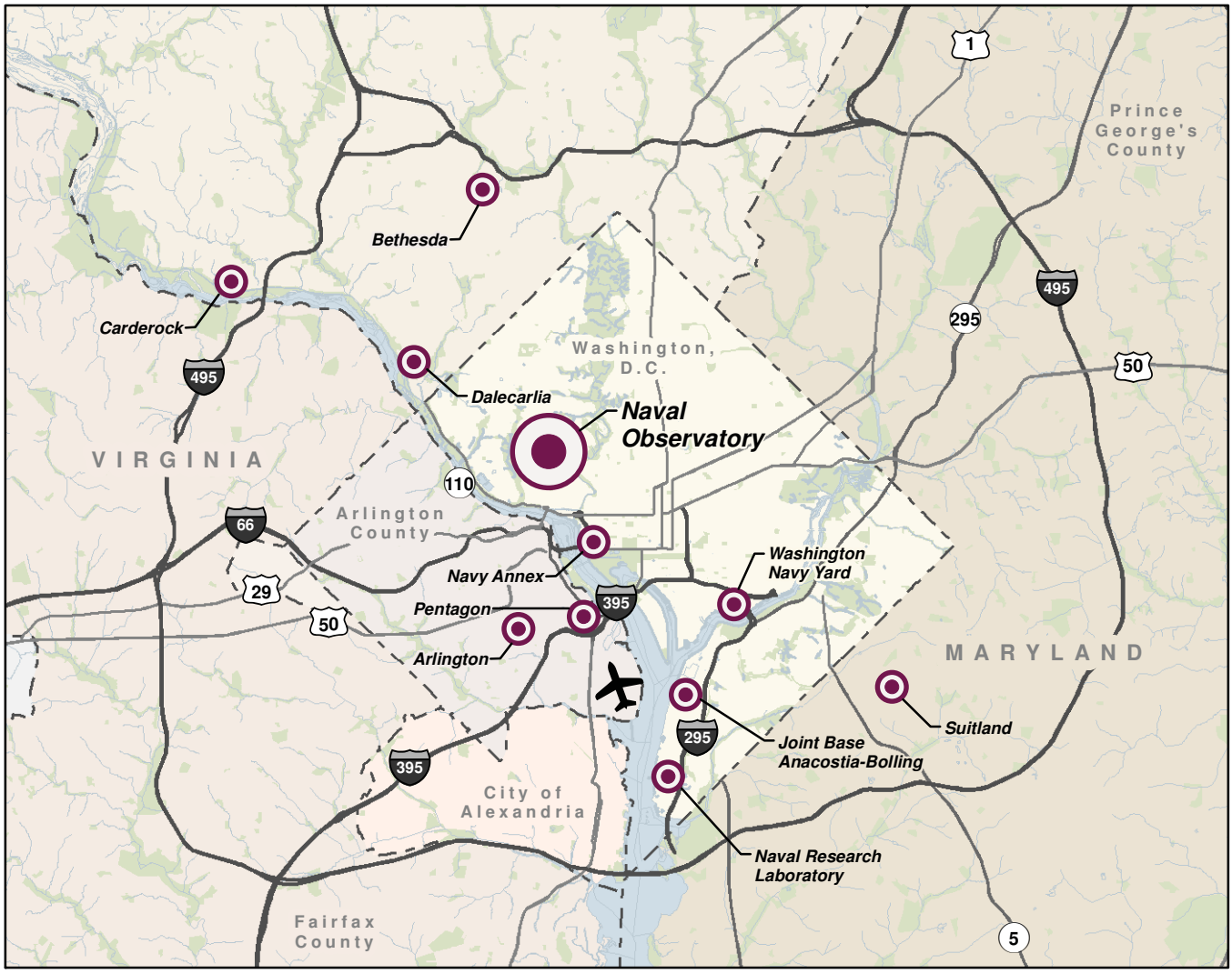
NSF Naval Observatory is the site of the official home of the Vice President of the United States.

2.5 Location

As depicted in Figure 2-3, the NSF Naval Observatory is located in the northwestern quadrant of the District of Columbia, approximately one half mile west of Rock Creek. The property's configuration is defined by a 1,000-foot radius from the center of the Clock Vault, which was situated at the center of Observatory Circle to provide maximum insulation from noise and vibration.

The 72-acre Installation is surrounded by densely populated Washington, D.C., neighborhoods, with Woodley Park to the east, Georgetown to the south, Glover Park to the west, and the National Cathedral to the north (Figure 2-4). To the east, the Installation is bordered by Massachusetts Avenue, a major thoroughfare. NSF Naval Observatory is located amid numerous embassies, with the Embassy of the United Kingdom, the Embassy of New Zealand, and the Embassy of China located adjacent to the Installation.

FIGURE 2-3 REGIONAL MAP



2.6 Local Planning Authorities

The National Capital Planning Act enables the National Capital Planning Commission (NCPC) to be the central planning agency for the federal government in the National Capital Region. NCPC is empowered with review authority over all federal development projects to ensure orderly and coordinated development of the federal government in the region and consistency with the Comprehensive Plan for the National Capital. Therefore, the development strategies contained in the NSF Naval Observatory Master Plan are intended to meet NCPC requirements as well as be consistent with the polices of the Comprehensive Plan for the National Capital. These policies include:

- Consulting with local agencies to ensure that federal workplaces enhance the design qualities and vitality of their communities
- Planning federal workplaces to be compatible with the character of the surrounding properties and community and, where feasible, to advance local planning objectives such as neighborhood revitalization.

While the review process remains the same regardless of where a project is located, NCPC has approval authority over all federal projects located in the District of Columbia (40 U.S.C. 8722(b)(1) and (d)), and advisory authority for projects located in the environs (40 U.S.C. 8722(b)(1)).

2.7 Regional Context and Planning Initiatives

The District of Columbia Office of Planning (DCOP) engages in planning efforts for specific neighborhoods by ward. NSF Naval Observatory is located in Ward 3, which includes the adjacent residential neighborhoods of Woodley Park and Glover Park. A public planning initiative potentially shaping the area near NSF Naval Observatory is the 2006 Glover Park Commercial District Analysis (Figure 2-4). The study focused on the Wisconsin Avenue corridor directly west of the Installation and includes recommendations for improved connectivity, pedestrian amenities, and public space. Of particular interest to the installation are the recommendations for additional lighting. Light pollution is the most significant impact to the USNO's mission. Further details on light pollution and recommended mitigation strategies are discussed in Chapter 3.

As of 2011, some of the Glover Park streetscape improvements have been completed, are in progress or planned, or have been set aside for future implementation. The most important element is the replacement of the "cobrahead" pole lights with more pedestrian friendly light fixtures along Wisconsin Avenue. This element shall be implemented in the near future.

FIGURE 2-4 RECOMMENDATION CONCEPTS FOR GLOVER PARK COMMERCIAL DISTRICT

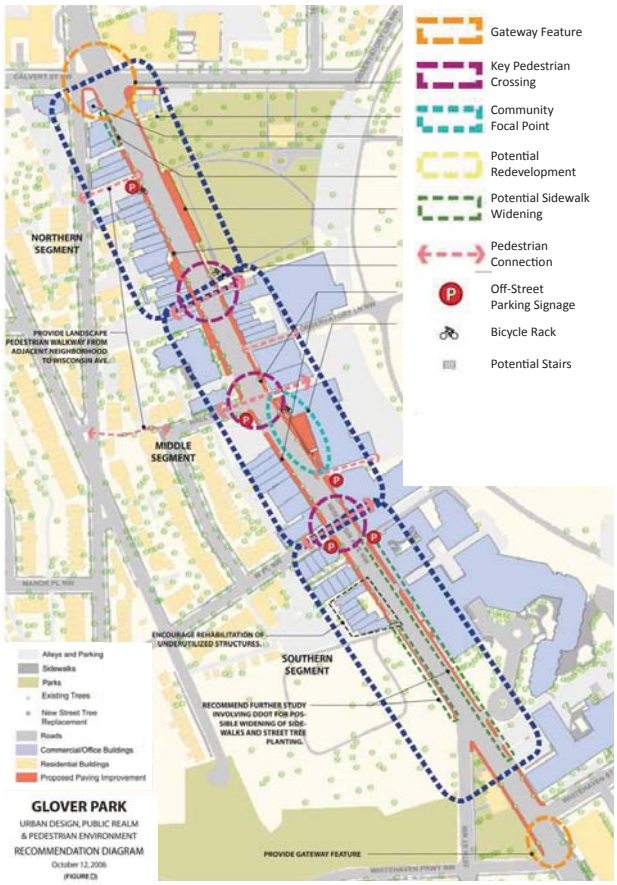
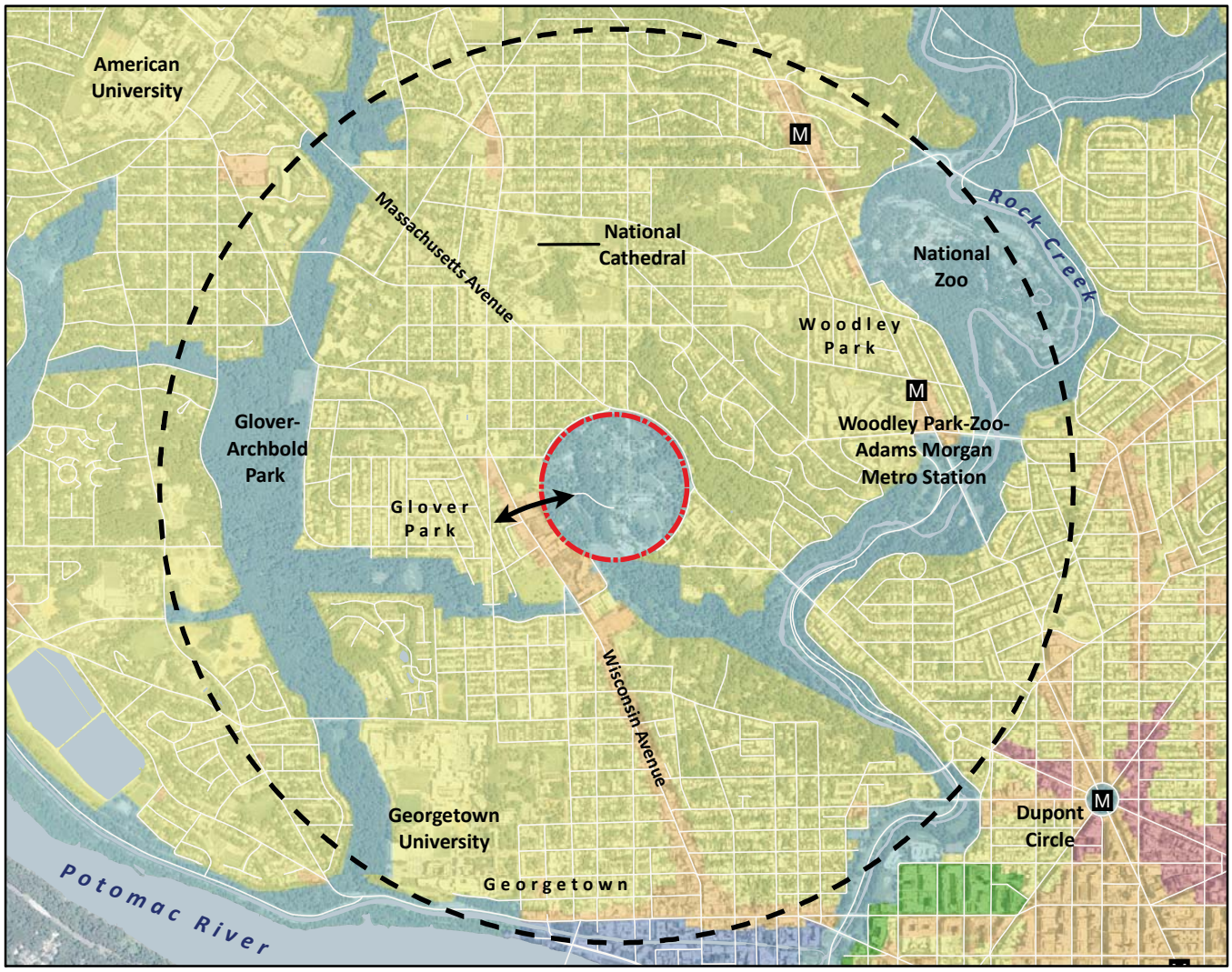


FIGURE 2-5 VICINITY MAP



Aerial view of NSF Naval Observatory, circa 1950.
Source: USNO.

Exterior view of the James Melville Gilliss Building (Building 1), circa 1988.
Source: USNO.

Residence of the Vice President of the United States, circa 1970.
Source: USNO.

2.8 Historical Development

The USNO is one of the oldest scientific agencies in the country. Established in 1830 as the Depot of Charts and Instruments, it was reestablished in 1844 as the USNO and located at the Foggy Bottom site of the District of Columbia.

In 1893 the USNO moved to its current location north of Georgetown on Massachusetts Avenue. At that time, this rural site was located well outside the city in the countryside. The site plan for the new Observatory buildings was laid out in a specific and precise manner. The buildings were arranged according to degrees and directions to allow for accurate and standard measurements. The site plan also included landscaping schemes, that will not obstruct observation points. The buildings all relate to one another and are interdependent.

In addition to the administrative and scientific structure, three residences were erected to house the USNO's superintendent and his staff. To prevent the encroachment of the rapidly growing city on the Observatory grounds, and to protect the integrity of the astronomical instruments and astronomers' ability to make accurate measurements, the enabling legislation for the new Observatory prohibited the construction of roads within a 1,000-foot radius of the center of the clock room. The resolution provided the Navy with the impetus to acquire the other properties that were within the radius of the circle. By 1900, the majority of the land, which today comprises the grounds, had been purchased or condemned.

Since the 1890s, scientific research at the USNO has been primarily related to the determination of the fundamental celestial positions, motions, and constraints, that comprise the field of astronomy. It is most noted as a laboratory for the study of positional astronomy and timekeeping.

In addition to its role in the scientific community, the northeast portion of NSF Naval Observatory serves as the Residence of the Vice President of the United States (Quarters A). In 1974, the house was designated by Congress as the first official temporary residence for the vice president. Prior to 1977, the vice president was responsible for his own accommodations and stayed in a private residence. However, the cost of securing private residences grew substantially over the years. Finally, in 1974, Congress agreed to refurbish the house at the Naval Observatory as a home for the Vice President. Although the original intention was to construct a new building, the structure was eventually designated as the permanent residence.

3.0 Existing and Emerging Conditions

Prior to developing the master plan, information on the existing conditions at NSF Naval Observatory is reviewed and analyzed to determine the developable potential of the installation. This chapter will discuss the existing conditions in regards to Land Use, Natural and Manmade Features, Facility Assets, Utilities, Circulation, and surrounding planning initiatives. The analysis in this chapter summarizes the various issues and constraints that need to be considered in developing the master plan.

3.1 Existing Land Use

The existing land use map (Figure 3-1) categorizes the activities that occur on the Installation. Each activity refers to the actual use that takes place in physical or functional terms. Table 3-1 summarizes the land use areas.

The land uses described below include definitions and descriptions of the character of the activities and where they occur. Land uses and their definitions were derived from the following sources: RIMP, Unified Facilities Criteria (UFC) 2-000-05N Category Codes, and Navy Shore Vision 2035 (NSV2035) Shore Capability areas.

Family/Bachelor Housing

Refers to residential dwellings and associated grounds that serve as the primary places of habitation for eligible personnel and their dependents. Eligible personnel are commissioned officers, warrant officers, enlisted members, and key civilian employees.

Three locations on NSF Naval Observatory are categorized as family/bachelor housing: the Residence of the Vice President of the United States northeast of Gillis Avenue, residential housing along Rogers Lane, and the area east of Building 1.

TABLE 3-1 LAND USE AREAS

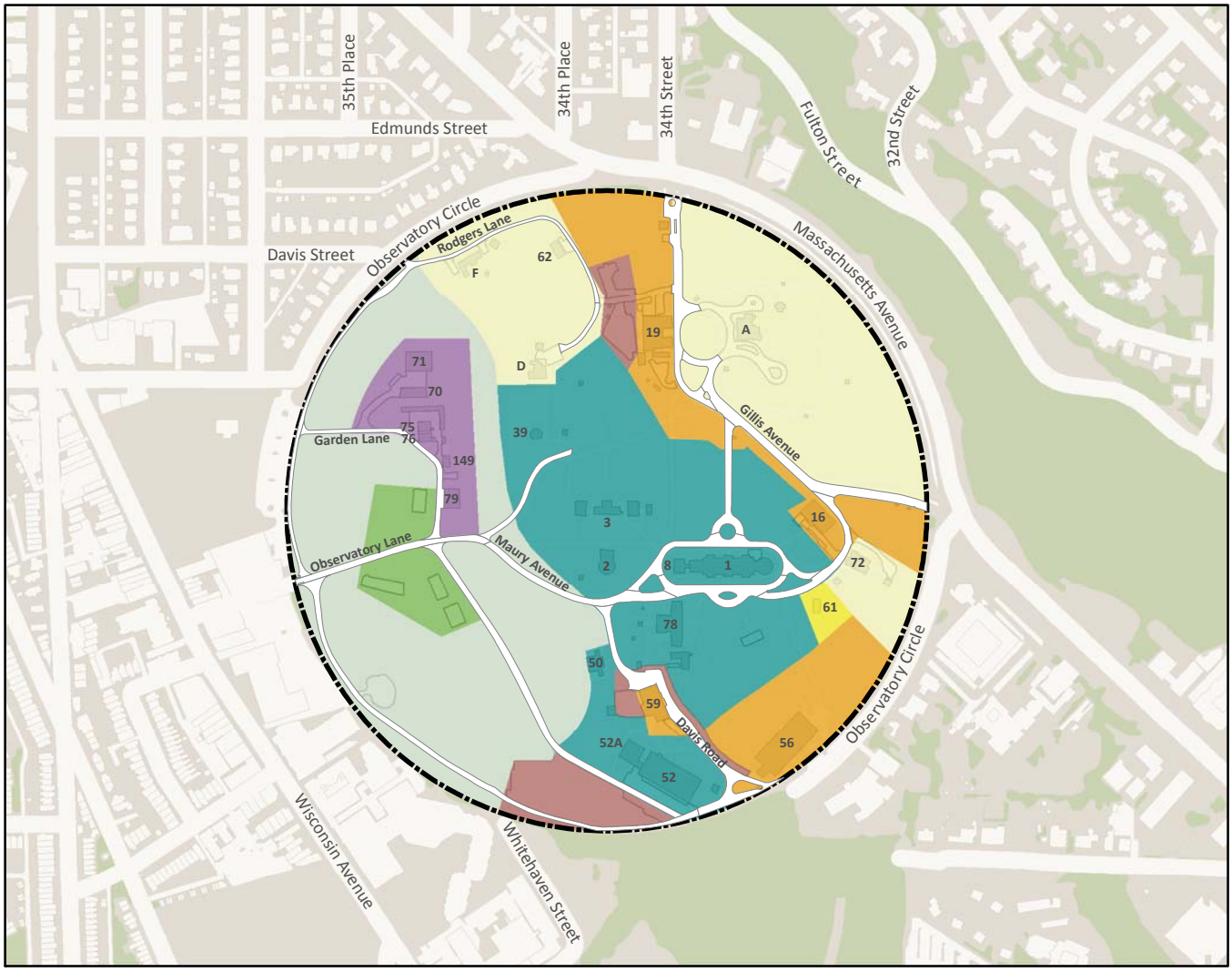
Land Use	Total Acreage	% of Total
Base Support	9.25	23
Family/Bachelor Housing	16.83	14
Open Space/Preservation	17.97	26
Parking	3.19	1
RDT&E	18.88	3
Recreation	2.42	4
Storage	3.18	25
Temporary Lodging	.38	4
Total	72.10	100

Note: Data above are responsive only to those values currently existing in Internet Navy Facilities Assets Data Store (iNFADS), Facility Readiness Evaluation Agency (FRES), and Geographic Information System (GIS) source data and do not account for any null values,, if applicable.

Sources: NAVFAC Washington; Washington, D.C., GIS, 2010; ESRI StreetMap USA, 2005; iNFADS, 2009.

The family/bachelor housing land use encompasses the general flag officers housing.

FIGURE 3-1 EXISTING LAND USE MAP



- Installation Boundary
- Base Support
- Family/Bachelor Housing
- Open Space/Preservation
- Parking
- RDT&E
- Recreation
- Storage
- Temporary Lodging

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

The residential areas include historic quarters and garages for general flag officers.

Base Support

Refers to facilities associated with public safety and Installation-wide services. Uses include fire/emergency, police/security, operations and maintenance offices, dependent schools, child development centers, religious facilities, pet kennels, transit stations, and gates. Functions being performed are essential operations that serve all Installation personnel and visitors.

Two major areas are categorized as installation support: along Gillis Avenue and at the South Gate and Building 56. The Gillis Avenue area encompasses USSS facilities (Buildings 16 and 19) used for administrative and support services for the Residence of the Vice President of the United States. The South Gate is the primary Installation entry point. Building 56 houses administrative offices that support the USNO. The Installation also has two smaller support areas including the police station and Stargazer Cafe in Building 59, and Wisconsin Gate, which primarily allows pedestrian access and limited vehicle access.

Research, Development, Testing, and Evaluation

Refers to facilities and associated areas that are used directly in theoretical and/or applied RDT&E operations. These facilities may be comprised of basic laboratory bench-type modules, larger set-ups of bench-type laboratory activities, systems simulation centers including data processing laboratories, and one-of-a-kind facilities such as tow tanks, environmental chambers, and wind tunnels. Facilities may also include office space, and research support functions such as food service, storage, libraries, and auditoriums.

The mission of NSF Naval Observatory is primarily RDT&E, which encompass several facilities. The land use represents the largest area and concentration of personnel. Facilities are generally grouped toward the center and southern sections and include:

- Buildings 2, 3, 8, 39, and 78: laboratories that support research for astronomy and data applications
- Building 50: houses the atomic clock which serves as the official source of time for the DoD and as the standard of time for the United States
- Buildings 1 and 52: include offices that support the RDT&E mission
- Building 52A: the data processing center that maintains all the data collection for USNO
- Emergency generator and storage facilities: support the RDT&E mission and occupy small facilities spread across the land use area

The Stargazer Cafe provides food service for employees and visitors.

Building 56 at the South Gate serves as an administrative center for tenant agencies.

Building 39, the Equatorial Telescope Laboratory, supports the USNO's RDT&E mission.

Building 50 houses the Atomic Clock, an integral mission at NSF Naval Observatory.

Building 61 is the only temporary lodging facility on NSF Naval Observatory.

The recreation area west of Morgan Lane includes a recreational trail, sports courts, picnic area, and playground area.

Building 79 stores materials and equipment used by the PWD.

Temporary Lodging

Refers to facilities that provide temporary living accommodation that are normally rented for a service charge for overnight or short-term use to authorized personnel. Eligible personnel include official military or civilian personnel, visitors, and transient personnel/families awaiting assignment to quarters. Facilities can be apartment-style, hotel-style, motel-style, or dormitory-style living quarters. Additional amenities may be included such as outdoor recreation areas, dining halls or kitchenettes, and laundering facilities.

The temporary lodging function is one of the smallest land use areas and encompasses only Building 61, Transient Observers' Housing,

Recreation

Refers to facilities that support recreation activities for all authorized personnel to promote physical fitness, teamwork, leadership, skill development, and environmental ethics. Those eligible include official military and civilian personnel, visitors, and transient personnel/families. Outdoor facilities include athletic fields/courts/rinks, swimming pools, dog parks, playgrounds, marina/port operations, and amphitheaters. Indoor facilities include gymnasiums, fitness centers, and youth centers. Each facility type may be accompanied by supporting food service.

The recreation area is located west of Morgan Lane and is surrounded by woods. This area provides public amenities for casual events or recreation and includes a recreational trail, basketball court, tennis court, volleyball court, picnic area, and playground area.

Storage

Refers to facilities and associated real property associated with keeping quantities of equipment and supplies critical to mission activities. Facilities include the housing of general supplies, cold storage, open storage areas, fuels and non-propellants, and ammunition. Storage facilities may have associated real property that creates separation from other land uses for the purposes of establishing safe distances when dangerous materials are being stored, creating visual buffers to limit sight lines into the facilities, or allowing for outdoor storage areas.

Content intentionally omitted

Open Space/Preservation

Refers to real property dedicated for outdoor public use and for the protection of natural/cultural features. Examples include parks, ceremonial parade fields, habitat preservation areas, and viewsheds.

The land use resides along the western perimeter of the Installation and surrounds the storage and recreation land uses. Woodland occupies most of this land use, providing habitats for urban wildlife, shade and screening from the adjacent embassies, and residential housing.

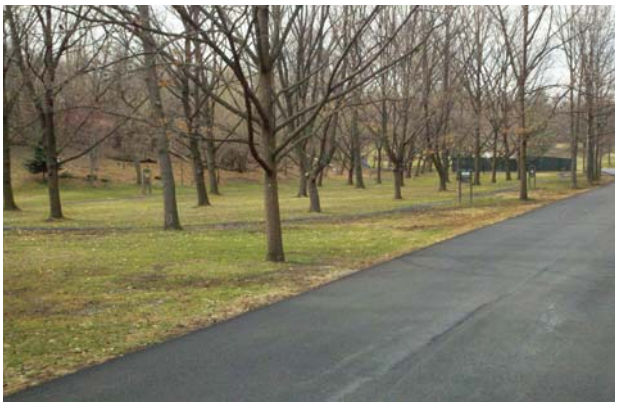
Parking

Refers to areas and facilities where parking for organizational and non-organizational vehicles is the primary or only function. Areas include paved surfaces or stabilized areas that are expressly designated for parking.

Three main areas are identified as the parking land use:

- The parking lot west of the South Gate at the southern perimeter. It is the largest surface parking lot on NSF Naval Observatory. Most commuters park their privately owned vehicles in this area and walk to their places of employment. The western edge of this surface lot is also used as an outdoor storage area.
- On-street parking along Davis Road and adjacent to Building 59. Building 59 parking is mostly used for police department fleet vehicles.

Content intentionally omitted



Woodlands, at the southwest perimeter, buffer the Installation from the residential housing development.

The South Gate parking lot is the primary parking area for most commuters on NSF Naval Observatory.

Trees and forest stands not only help to moderate the outside temperature, but also enhance the aesthetics of the Installation.

Oak, hickory, and pine trees comprise the forest stands and help reduce light pollution for mission requirements.

3.2 Existing Natural and Man-made Features

This section describes natural and man-made features that exist on the NSF Naval Observatory and their implications. Only features with major impacts to planning are considered; these include:

- **Natural Features:** watercourses, floodplains, wetlands, soils, topography, vegetation, wildlife habitats, and air quality
- **Cultural Resources:** sites, structures, landscapes, and objects of scientific, historic, religious, or ceremonial importance
- **Operational Constraints:** those posed by mission activity such as hazardous materials and waste, easements, setbacks, Explosive Safety Quantity Distance (ESQD) arcs, and utilities

Information from prior studies such as the RIMP and field surveys of the Installation were used to define the baseline features of NSF Naval Observatory.

Natural Features

Topography

NSF Naval Observatory is located on high ground that is the second highest point in Washington, D.C. (Figure 3-2). Building 3, the Observer's Electronic Lab, is located in the middle of the Installation at the highest point. The topography then slopes down in all directions from that peak. Several areas have steep slopes that limit development. Where development opportunities are present, significant grading and site engineering is required.

Geology and Soils

NSF Naval Observatory is located within the Piedmont Geologic Province, which is characterized by rolling hills underlain by metamorphosed, igneous, and sedimentary rocks. The bedrock provides exemplary bearing for heavy structures; however, it may be more difficult to excavate close to the surface where bedrock is.

Soils at NSF Naval Observatory fall under four general types: the Joppa Series, the Sassafras Series, the Woodstown Series, and the Udorthents Series. The Joppa, Sassafras, and Udorthents series soils pose some limitations to future development based on their characteristics, slope, and drainage (Figure 3-2). The Woodstown Series pose minimal development constraints for the future.

Floodplain and Flood Hazard

According to the Federal Emergency Management Agency, the Installation is located within the flood Zone C, which is designated as areas of minimal flood hazard that are higher than the elevation of the 0.2 percent annual chance of flood. Impacts from flooding to NSF Naval Observatory are minimal to none.

Surface Water

No surface water bodies are located at NSF Naval Observatory.

Wetlands

No wetlands are located at NSF Naval Observatory.

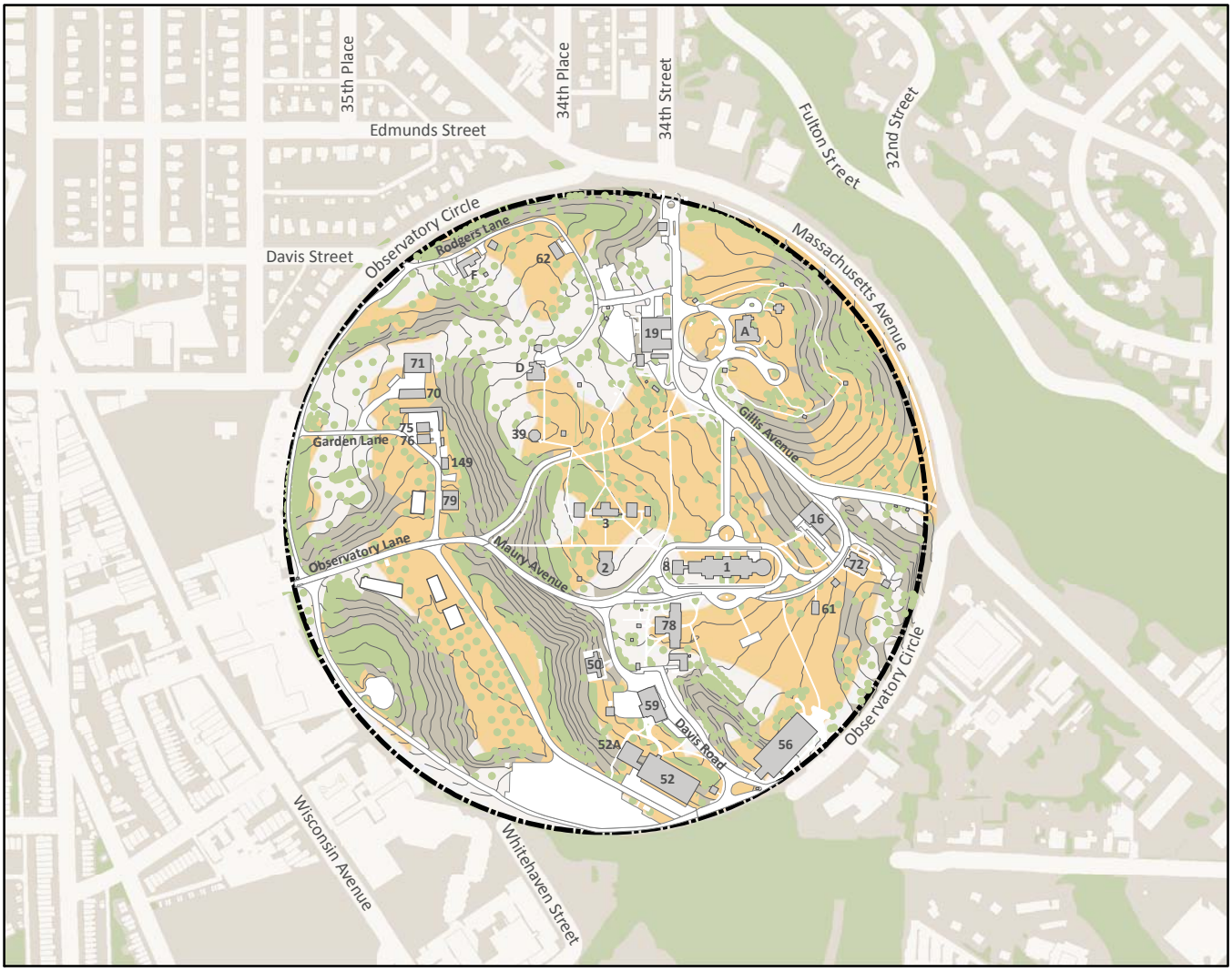
Stormwater

Stormwater is collected in a piped storm drain system. The storm drain outfalls to the District of Columbia municipal system and then to Rock Creek. Rock Creek flows southward into the Potomac River, then the Chesapeake Bay.

Vegetation and Wildlife

Urban development has displaced naturally occurring vegetation and wildlife with species that are artificially imposed or adaptive enough to endure the man-made environment. Vegetation is comprised of an artificially maintained mix of exotic and native tree, shrub, and herbaceous perennial species. These species include maples, oaks, hickories, flowering dogwood, red bud, mountain laurel, rhododendrons, azaleas, and various perennials.

FIGURE 3-2 EXISTING NATURAL FEATURES MAP



- Trees
- Installation Boundary
- 5-Foot Elevation Contour Line
- Steep Slopes (>15%)
- Vegetated Area
- Limited Development Suitability Soils

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

White-tailed deer are prevalent on the Installation.

Trees and forest stands are pertinent to the USNO mission, helping to moderate temperature and mitigate light pollution at the NSF Naval Observatory. Forest stands are abundant on the western portion of the Installation.

NSF Naval Observatory contains remnants of natural vegetation that provide habitat for wildlife, especially white-tailed deer, raccoons, rabbits, and opossums. Animal species indicative of cities also observed here include eastern gray squirrels, mourning doves, European starlings, rock doves, American crows, and house sparrows.

Threatened and Endangered Species

No plant or animal species present at NSF Naval Observatory are listed as threatened and endangered species.

Air Quality

NSF Naval Observatory is located within the Metropolitan Washington non-attainment area, meaning that the area does not meet federal standards for ozone and the amount of fine particulates in the air. As a result, NAVFAC Washington is required to author and follow a State Implementation Plan to monitor and reduce air pollution to meet the established U.S. Environmental Protection Agency (EPA) standards. The State Implementation Plan outlines policies to achieve and maintain air quality standards as per the Clean Air Act of 1970 and its amendments.

No major sources of air pollution are generated on NSF Naval Observatory. NAVFAC Washington staff routinely collect data and document air quality to ensure that the installation remains in compliance with air quality standards.

Natural Feature Planning Considerations

Summarized below are the planning considerations that shall be taken with regard to natural features when contemplating new development or may require mitigation to develop, as shown in Figure 3-2.

- Although steep slopes impose constraints to development, the value of land and demand for growth can necessitate the evaluation of land with steep grades for future building sites.
- Developing on unstable soils will require special engineering to reinforce the structures against poor drainage and erosion.
- Native vegetation and forest stands shall be maintained where possible to preserve the landscape, enhance the Installation, maintain habitats for wildlife, moderate the temperature, and reduce light pollution.

Building 2, the Great Equatorial/26-inch Telescope Building, considered an contributing NRHP building.

Cultural Resources

According to the NDW Integrated Cultural Resource Management Plan (ICRMP), 2012-2016, the entire NSF Naval Observatory is a historic district (Naval Observatory Historic District) eligible for listing on the National Register of Historic Places (NRHP) (Figure 3-3). The boundaries of the historic district reflect the intention of the circular plan of the Naval Observatory as early as 1894 and its completion by World War II. It is eligible as a historic district because the work at the installation throughout history has contributed to the scientific fields of astronomy, timekeeping, and navigation, and is the only institution in the United States, and one of the very few in the world, that conducts practical astronomical research rather than theoretical astronomical research.

Two of the existing 53 facilities on the installation are identified as being eligible for listing in the NRHP; 17 have been determined contributing to the historic district; 11 have been determined non-contributing; and the remainder have not been surveyed (Table 3-2).

Three known archaeological sites are located on NSF Naval Observatory. An investigation completed in 2010 found that portions of sites 51NW179 and 15NW180 had sufficient integrity and information potential to warrant NRHP eligibility. The forested hillsides in Site 51NW180 were found to have extensive evidence of prehistoric quartz procurement and tool manufacturing. These deposits retain integrity and were recommended as eligible for listing on the NRHP under Criterion D based on the potential to address prehistoric research questions related to the quartz industry in the District of Columbia. A small (1-acre) area of the 51NW179 site was found to have sufficient information potential and integrity to be considered a NRHP-eligible site. Site 51NW133 was found to be not eligible for NRHP listing. That site contains prehistoric components, a nineteenth century outbuilding, and quarrying debris.

Building 1 is considered a contributing resource to the Naval Observatory Historic District.

Cultural Resource Planning Considerations

Summarized below are the considerations that shall be taken with regard to cultural resources when contemplating new development or may require mitigation to develop as shown in Figure 3-3.

- Future development shall be in compliance with the requirements of Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended for development within the historic district and undertakings on historic properties. New construction and additions shall match the architectural style and context of the installation. Section 106 Standard Operating Procedures for compliance of the NHPA can be found in the 2012-2016 NDW ICRMP.
- Structures eligible and contributing to the NRHP shall be maintained as closely as possible to their original state. Adaptively reusing or retrofitting these facilities with modern functions is the preferred option for redevelopment.
- Development that will disturb archaeological sites shall follow Section 106 Standard Operating Procedures to preserve or remove the artifacts found in the 2012-2016 NDW ICRMP.
- Further study of how the NSF Naval Observatory landscape may affect cultural resources is recommended.

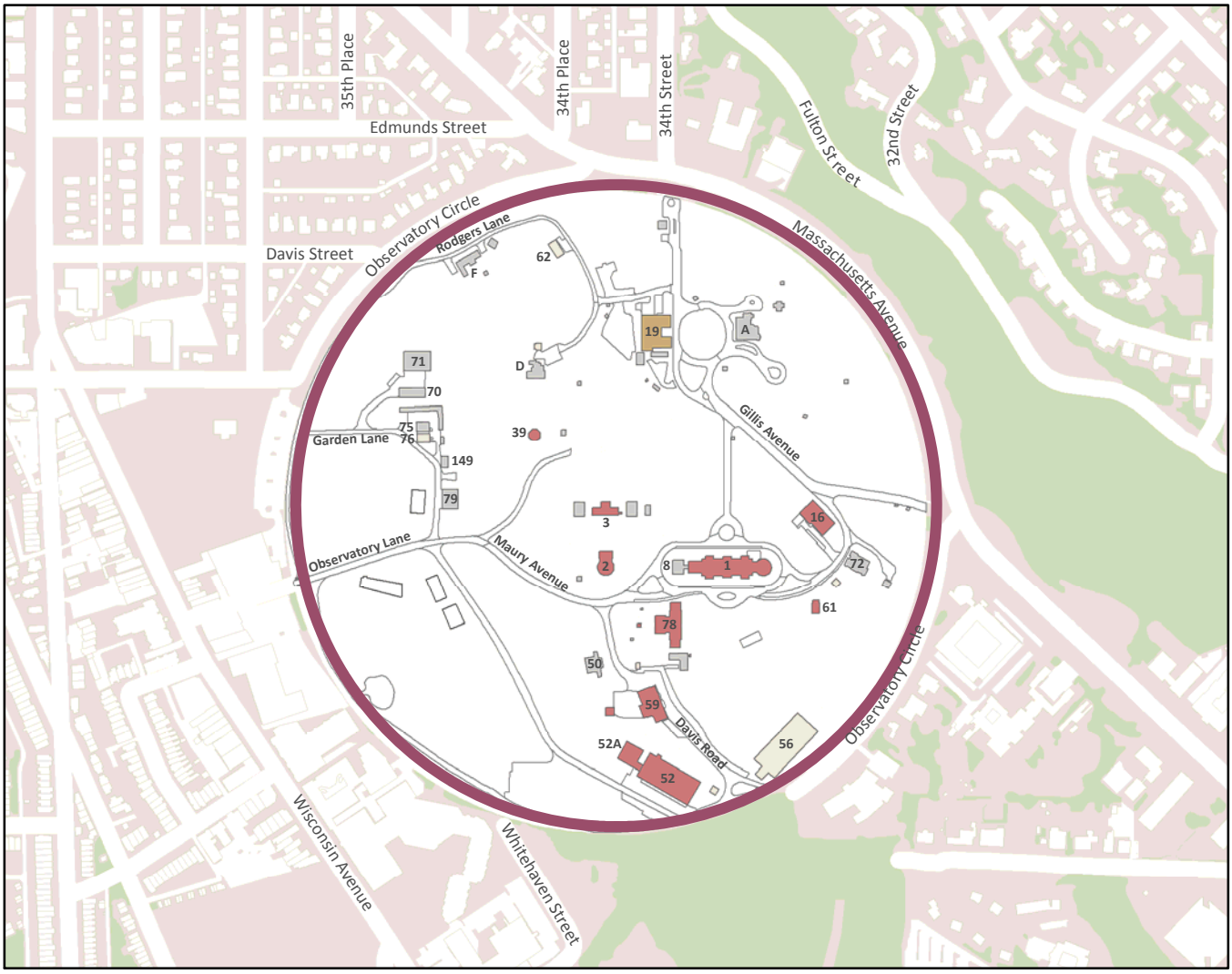
TABLE 3-2 INVENTORY OF HISTORIC PROPERTIES

Bldg. No.	Facility	Year Built	Status	Bldg. No.	Facility	Year Built	Status
1	Administration Building	1891	C/NR	77	Storage Building (AC Facility)	1961	NC/NR
2	Great Equatorial/26" Telescope Building	1890	C/NR	78	Master Clock Building/Simon Newcomb Lab	1961	C/NR
3	Clock House/Observers' Room	1890	C/NR	81	Antenna System N-T Aid	1968	NS
8	NO96 Administration Building	1890	NS	82	Tech Lab Building	1970	NS
16	Boiler House/Dynamo House/ Shop	1890	C/NR	83	Electrical/Emergency Power	1969	NS
19	USSS Administration Building	1892	E	84	Hydrogen Master	1969	NS
25	Transit Lab/Portable Transit Lab	1897	C/NR	87	Telescope Building	1964	C/NR
37	Maintenance Building	Unknown	NS	90	PZT Building	1999	NS
39	40" Telescope Building/24" Telescope Building/Astronomy Lab	1932	C/NR	91	Pesticide Building	1999	NS
43	Garage for Quarters D	1932	NC/NR/PPV	92	Wisconsin Avenue Gate	1976	NS
44	Garage for Quarters B and C	1928	NC/NR/PPV	93	South Gate	1976	NS
52	Instrument Repair and Storage Building/ Material Building/Tech Labs	1941	C/NR	94	Gillis Gate	1991	NS
54	Storage/Clock Vault	1918	C/NR	95	Hazardous Material Building	1991	NS
56	Material Storage Building	1944	NC/NR	96	Antenna Control Building	1986	NS
58	Inflammable Storage (Paint Storage)	1940	NC/NR	97	34th Street Main Gate	1994	NS
59	Cafeteria/Cafe and Security Building	1943	C/NR	104	Outdoor Monument	1993	NS
60	General Warehouse	1943	NC/NR	106	Playing Field (Running Track)	1987	NS
61	Compass Adjustors' House/Guest House	1943	C/NR	107	Communications Antenna Base	1986	NS
62	Garage Annex	1943	NC/NR	109	Hazardous Storage Structure	1979	NS
64	Garage	1944	NC/NR	111	Anchor Monuments	1954	NS
70	Tennis Court	1910	NS	112	Anchor Monuments	1954	NS
A	Quarters A	1893	E	116	General Storage Shed	1979	NS
72	Quarters B and C	1897	C/NR/PPV	731S2	Sidewalk	1893	C/NR
73	Quarters F and G	1946	NC/NR/PPV	750W	Retaining Wall	1892	C/NR
74	Quarters D	1900	NC/NR/PPV	750W1	Retaining Wall	1892	C/NR
75	Maintenance Shop	1999	NS	-	Circulation Plan/Campus Building Plan/ Topographical Features	1893	C/NR
76	Carpenter Shop (Ground Equipment)	1960	NC/NR	-	-	-	-

Note: E=Eligible, C=Contributing, NC=Non-Contributing, NR=National Register, PPV=Public Private Venture, NS=Not Surveyed

Source: NDW Integrated Cultural Resource Management Plan, 2012-2016.

FIGURE 3-3 EXISTING CULTURAL RESOURCES MAP



Naval Observatory Historic District
Not Surveyed
NRHP Contributing Structure
NRHP Eligible Structure
NRHP Non-Contributing Structure

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Operational Constraints

Hazardous Waste

Content intentionally omitted

Solid Waste

Content intentionally omitted

Asbestos and Lead-Based Paint

Content intentionally omitted

Polychlorinated Biphenyl Transformers

Content intentionally omitted

Pesticides/Herbicides/Fertilizers

Content intentionally omitted

TABLE 3-3 HAZARDOUS WASTE STREAMS

Content intentionally omitted

Radon

Content intentionally omitted

Ammunition, Electronic, and Explosive Storage Constraints

Content intentionally omitted

Restricted Access Areas

Content intentionally omitted

Frequency Spectrum

Content intentionally omitted

FIGURE 3-4 EXISTING OPERATIONAL CONSTRAINTS MAP

Several facilities on NSF Naval Observatory are within the minimum AT/FP setback from roadways and parking.

Anti-Terrorism/Force Protection and Security

Content intentionally omitted

Content intentionally omitted

Operational Planning Considerations

Content intentionally omitted

FIGURE 3-5 ANTI-TERRORISM/FORCE PROTECTION SETBACK DISTANCES MAP

TABLE 3-4 CONDITIONAL AND RESTRICTED DEVELOPMENT CONSTRAINTS

Content intentionally omitted

FIGURE 3-6 LAND SUITABILITY ANALYSIS MAP

Image intentionally omitted

Land Suitability Analysis

The natural, cultural, and operational features that were described in this chapter impose limitations on the Installation's future growth and development potential. Based on these limitations, land suitable for development can be analyzed. Two types of land suitability are illustrated in Figure 3-6. Land suitability types are classified below:

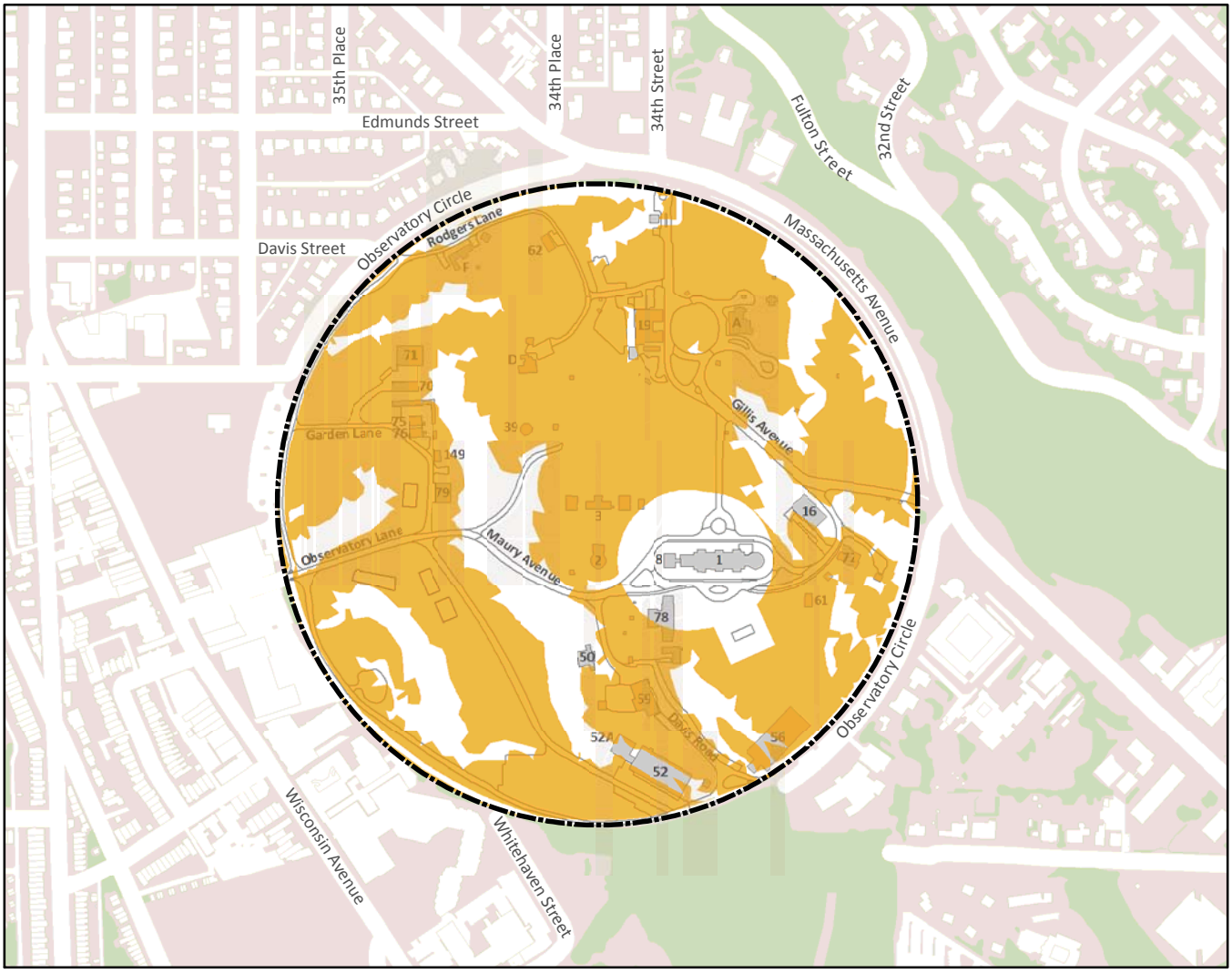
- **Unrestricted to Development:** denotes areas that do not have constraining factors. Due to the amount of environmental constraints, no areas fall into this category.
- **Conditional to Development:** denotes areas with constraining features that will need mitigation to offset the impacts caused by future development. Mitigation is considered to be reasonably achieved if proper processes are implemented.
- **Restricted to Development:** delineates areas with constraining factors considered difficult to mitigate if development were to occur in these locations. While it is possible to develop here, it may be cost-prohibitive, time-consuming, and/or too overtly difficult to mitigate the impact.

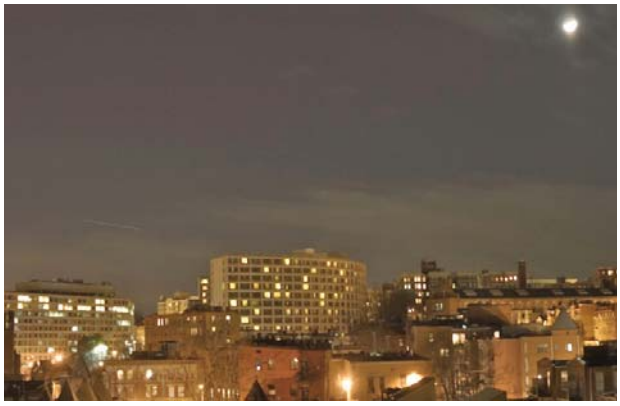
Before proposing development within these areas, the value of the existing features and the potential to mitigate their disruption shall be considered carefully. Table 3-4 lists the natural and man-made constraints that contribute to the constraints that are either "Conditional" or "Restricted" to development.

Developable Areas

The Developable Areas Map, shown in Figure 3-7, represents the existing suitability assessments, and illustrates the areas where development can occur. The developable areas will provide the basis for development opportunities at NSF Naval Observatory. While there are numerous considerations beyond those reflected in this graphic, new development at the installation will be directed toward these areas.

FIGURE 3-7 DEVELOPABLE AREAS MAP





Light trespass and sky glow in Washington, D.C.
Source: http://data.nextrionet.com/site/idsa/im-lightpollutiondc.jpg.

3.3 Encroachment Impacts

Light Pollution

The principal concern facing NSF Naval Observatory relates to urban light pollution. Dark skies are essential to astronomical observation, and extraneous light diminishes the ability of Navy astronomers to conduct sensitive data collection.

The USNO is affected by both "sky glow" and "light trespass" forms of light pollution. Sky glow results from the scattering of light from sources throughout the city that emit light upward. This glow interferes with the Observatory's sensitive astronomical equipment. Light trespass refers to direct lighting sources in close proximity that affect the Observatory due to improper directionality or shielding. Light pollution is especially problematic for the USNO due to its location at the center of a major metropolitan area. If light pollution continues to worsen, the USNO observation activities will be severely threatened.

The work of the USNO principally involves observation toward the south, which coincides with the greatest lighting conflicts emanating from that direction. New lighting sources in that vicinity have the potential to be most damaging to the continued viability of astronomical data collection. Figure 3-8 shows the principal observation zone and areas of known lighting conflicts.

Currently, the District of Columbia has in place a Naval Observatory (NO) zoning overlay that restricts building heights within a defined area surrounding NSF Naval Observatory; however, the zoning designation makes no mention of lighting requirements. In the future, lighting recommendations will be incorporated into the zoning to preserve USNO's mission.

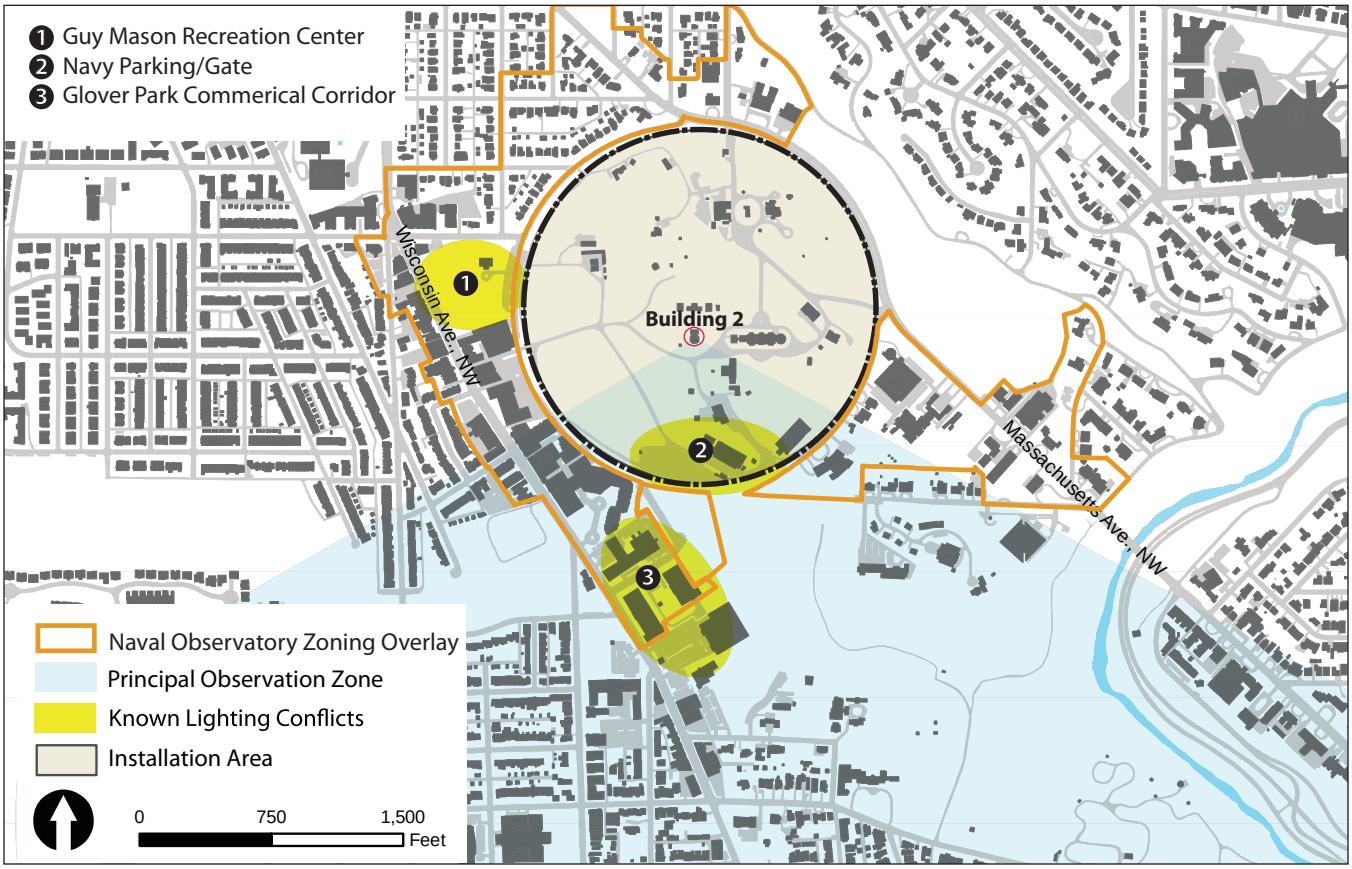
The 2012 NAVFAC comprehensive lighting study presents an analysis of the existing lighting conditions at NSF Naval Observatory. It also provides recommendations for: improvements to enhance dark sky conditions, maximizing security of the Vice-President's residence, and minimizing light trespass from adjacent properties outside the installation.

Dumbarton Oaks Park, south of NSF Naval Observatory, provides additional tree cover to mitigate light pollution and the heat island effect for USNO's mission.
Source: www.doak.org.

Additional recommendations are made for the NSF Naval Observatory and the surrounding metropolitan area.

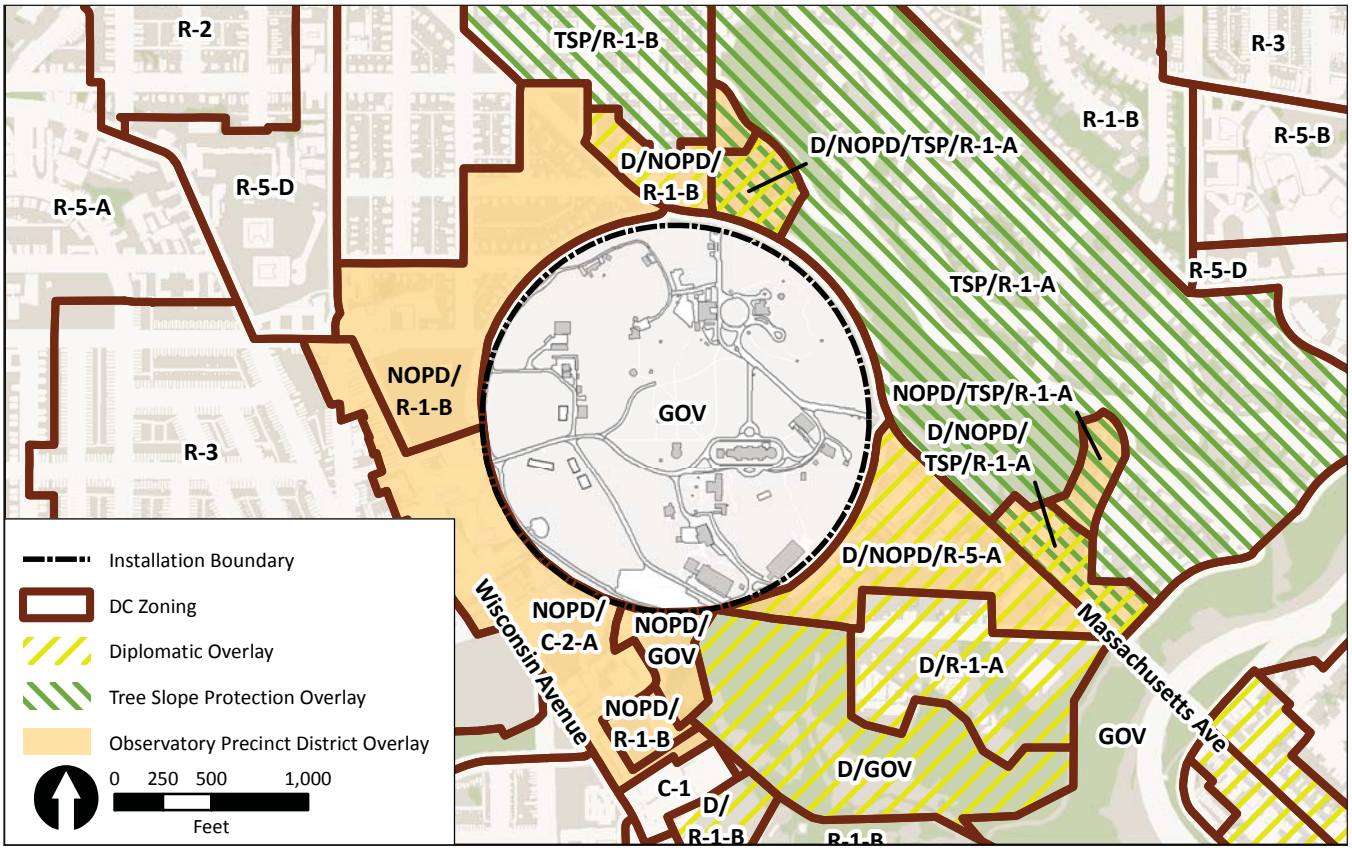
- NSF Naval Observatory Lighting Design Changes
  - Reduce the lighting levels in the areas surrounding several buildings specifically Buildings 19, 37, 50, 54, 56, and 91. These facilities can still meet required lighting levels for safety and security.
  - Design lighting levels on walkways, parking lots, and streets to meet 0.7 Foot-candles.
  - Consider fixture shielding and replace all broad spectrum lighting sources with Low Pressure Sodium fixtures with future lighting designs.
  - Minimize changes to the historic features of the installation.
  - Evaluate all of the guard booths throughout the installation for compliance with the latest UFC standard and redesign lighting to meet both the UFC design manual and the IES handbook illuminance level recommendations.
  - Incorporate guard booth light sources with a CRI of 80 or above.
- NSF Naval Observatory Lighting Fixture Replacement
  - Conduct a detailed lighting and engineering design to replace unshielded fixture types with fully shielded fixtures.
  - Replace all unshielded lighting fixtures with fully shielded fixtures throughout the Installation.
  - Replace all broad spectrum lighting sources including existing High Pressure Sodium, Metal Halide and Fluorescent lighting fixtures with Low Pressure Sodium fixtures on walkways, parking lots and streets, with the exception of security guard booth areas where the UFC standard is followed.
  - Ensure that future lighting designs that include replacement of the Washington Globe fixtures do not alter the historic fabric of the installation.

FIGURE 3-8 EXISTING LIGHTING CONFLICTS AND OVERLAY DISTRICTS



Source: NSA Potomac Encroachment Action Plan, 2010.

FIGURE 3-9 EXISTING DEVELOPMENT IN THE VICINITY OF NSF NAVAL OBSERVATORY



Source: NSA Potomac Encroachment Action Plan, 2010.

- NSF Naval Observatory Lighting Controls
  - Implement occupancy sensors to control non-emergency lighting after normal work hours throughout the Installation, especially for building office spaces with a direct line of sight to the outside.
- NSF Naval Observatory Installation
  - Install shades on building doors that are transparent or replace the door with a solid door on facilities.
  - Develop a vegetation plan to replace dead or dying trees and add new trees along the southern perimeter in order to mitigate light trespass all year long from sources outside of the installation.
  - Add foliage where feasible near buildings 50, 56, 59, and 78.
  - Include in the vegetation plan a one for one replacement of dead or dying trees in these areas with either new, medium to large evergreen trees (30-60+ feet tall) that are native to the Washington, D.C.
  - Establish a new policy for minimizing light pollution throughout the installation caused by headlights. This policy can be accomplished by installing new signs in parking areas adjacent to Buildings 2 and 39 instructing drivers to use only parking lights while parked. Rerouting vehicles along the southern perimeter of the installation would prevent headlights from shining directly at Building 3 and 39.
- Washington D.C. Lighting Fixture Replacement
  - Incorporate fully shielded Low Pressure Sodium fixtures into the District Department of Transportation's (DDOT) planned street light replacement for areas within the NO Precinct Overlay District. If fully shielded Low Pressure Sodium fixtures can not be used, then new LED street light fixtures need to be fully shielded.
- Washington D.C. Enhance Collaboration
  - Create a USNO advisory liaison committee to meet with all organizations that have the potential to affect lighting surrounding the Installation in order to raise awareness and reduce light trespass. Organizations may include DDOT, DC SHPO, NCPC, DDOE, and the Commission of Fine Arts.
  - Propose amendments to the Naval Observatory Precinct Overlay District in order to incorporate lighting requirements that support NSF Naval Observatory's mission.

For additional details on the lighting study analysis and the recommendations listed above, reference the Naval Observatory Lighting Study, May 2012.

Zoning, Development, and Heat Island Effect

Existing zoning and development in the vicinity of NSF Naval Observatory supports largely residential and embassy land uses, with commercial uses restricted to the Wisconsin Avenue corridor. Residential zones to the north and east allow for single-family detached homes by right. The residential zoning to the west, northwest, and southeast includes rowhomes and relatively low-density apartments.

Several zoning overlays are present in direct proximity to NSF Naval Observatory (Figures 3-8 and 3-9). The NO zoning overlay restricts building heights within a defined area surrounding the Installation. The NSF Naval Observatory overlay cites the need for enhanced oversight of development in this area due to the unique and historic nature of the scientific mission of the USNO paired with the security needs of the Residence of the Vice President of the United States. The Tree and Slope Protection overlay zoning applies to the Normanstone Drive area directly east of NSF Naval Observatory and aims to preserve the existing tree cover and natural topography of park-like residential neighborhoods. In addition, the Diplomatic overlay applies to the international embassies just outside the Navy perimeter.

The neighborhoods surrounding NSF Naval Observatory are largely built out and not expected to change significantly in terms of type or density of development. However, the urban heat island effect, where developed areas are warmer than surrounding rural areas, represents a secondary challenge related to the city location of the USNO. Impervious surfaces, including building roofs, roads, and parking lots, absorb much more heat from the sun than vegetated surfaces. The retained heat produces both daytime and nighttime temperatures in cities well above those in surrounding rural areas. This excess heat can result in optical turbulence for the USNO and is especially problematic with respect to the significant amount of impervious cover to the west and south of the Installation.

As a solution to the heat island effect, preservation of tree canopy and cover is an expressed goal for both NSF Naval Observatory and the District. Enhancement of vegetative tree cover benefits the USNO both through mitigation of heat island effects and by screening conflicting lighting sources. NSF Naval Observatory has an Urban Forest Management Plan (2009) in place to guide maintenance of existing mature trees within the fence line. The District, in addition to the Tree and Slope Protection overlay, expresses tree canopy enhancement goals in the 2006 Comprehensive Plan, which is street tree planting and tree requirements for new development.

Building 78 houses the Simon Newcomb Laboratory.

3.4 Existing Facility Assets

The following sections analyze the existing conditions of facilities on NSF Naval Observatory.

Types of Facilities

Using the UFC 2-000-05N category codes, four facility classes are found on NSF Naval Observatory (Table 3-5).

Maintenance and Production

Facilities classified as maintenance and production are minimal in comparison to the other facility category codes.

Content intentionally omitted

Research, Development, Testing, and Evaluation

The central core of the Installation is comprised of RDT&E facilities which support USNO's mission. These facilities include Building 2 (Equatorial 26-inch Telescope House), Building 3 (Observer's Electronic Laboratory), Building 39 (24-inch Equatorial Telescope), Building 50 (Atomic Clock), and Building 78 (Simon Newcomb Laboratory). Small facilities that support the RDT&E mission such as emergency generator buildings or transit houses associated with the telescopes are scattered across this area.

Administration

Administrative facilities encompass the central-eastern and southern sections. The more prominent facilities are scattered throughout the area. These include Buildings 16 and 19 (USSS Administration), Buildings 1, 8, and 52 (USNO Administration), Building 52A (Data Processing Center), and Building 56 (Agency Administration). The facilities are dispersed due to the topography of the Installation.

Building 59 includes the Stargazer Cafe and police station.

TABLE 3-5 FACILITY TYPES BY CLASS

Facility Class	Total SF	% of Total
Operational and Training (100 series)	7,247	0.0
Maintenance and Production (200 series)	3,897	13.2
RDT&E (300 series)	14,558	14.9
Supply Facilities (400 series)	1,902	0.0
Medical (500 series)	0	0.0
Administration (600 series)	179,257	24.0
Housing and Community (700 series)	47,159	47.9
Utilities and Ground Improvements (800 series)	2,929	0.0
Total	256,949	100.0

Note: Data above are responsive only to those values currently existing in iNFADS, FRES, and GIS source data and do not account for any null values if applicable.

Source: NAVFAC Washington in conjunction with EMA, 2008; Washington, D.C., GIS, 2008; ESRI StreetMap USA, 2005; iNFADs, 2009; FRES, 2009.

Housing and Community

Housing and community facilities are generally located in two areas of the Installation: northeast of Gillis Avenue and southwest of Morgan Lane. The area northeast of Gillis Avenue encompasses the vice presidential residence and complex and general flag officers and transient housing. The flag officer residences and associated land are managed by Mid-Atlantic Military Housing, LLC, under the Military Housing Privatization Initiative. Congress established the tool to help the military improve the quality of life for its service members by improving the condition of their housing. The Military Housing Privatization Initiative was designed and developed as a public/private program whereby private sector developers may own, operate, maintain, improve, and assume responsibility for military family housing via a 50-year lease, where doing so is economically advantageous, and national security is not adversely affected.

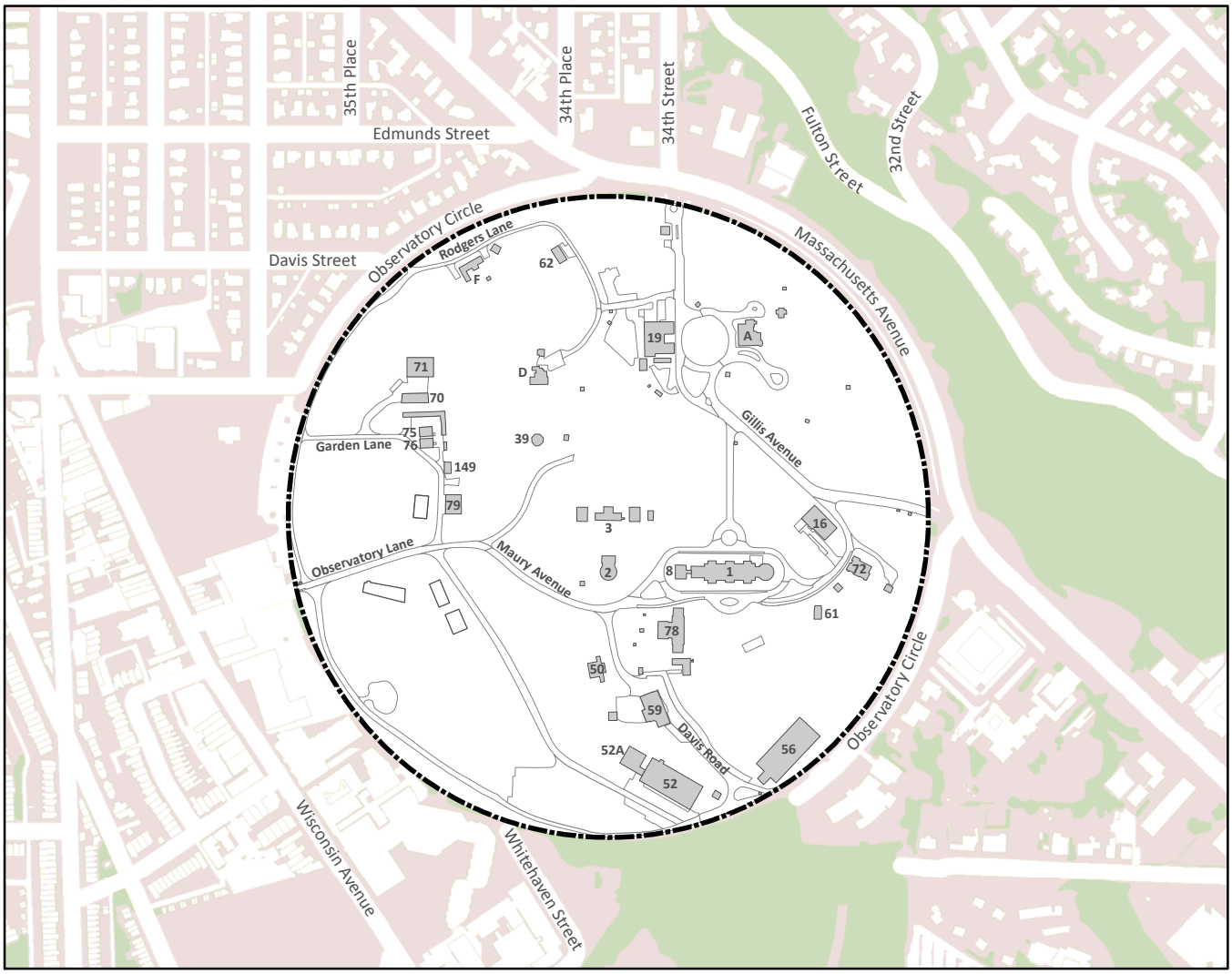
Facilities in the second area southwest of Morgan Lane include recreational sport courts (e.g., basketball, tennis, and volleyball) and playground equipment. The Stargazer Cafe and police station are east of this area along Davis Road.

TABLE 3-6 FACILITY ASSETS

Facility No.	Name	Area (sf)	Building Height (lf)	Stories	Year	Renovated	Quality Rating
1	ADMINISTRATION BUILDING	52,422	70	5	1886		52
2	EQUATORIAL 26-INCH TELESCOPE HOUSE	5,948	40	1	1890		60
3	OBSERVERS ELECTRONIC LAB	3,259	19	1	1890		55
8	ADMINISTRATION BUILDING	2,814	24	1	1832		49
16	BOILER HOUSE/COMPCTR/1967	10,535	37	3	1890		54
19	USSS ADMINISTRATION BUILDING	16,889	24	2	1836	1997	66
25	PORTABLE TRANSIT HOUSE	137	11	1	1897		84
34	VP GROUND MAINTENANCE SHED	230	12	1	2004		100
35	VP GROUND MAINTENANCE SHED	48	12	1	2004		100
36	USSS STORAGE SHED	100	8	1	2002		100
37	EMERGENCY GENERATOR BUILDING	624	11	1	1914		52
39	24-INCH EQUATORIAL TELESCOPE BUILDING	2,117	35	2	1932		71
43	QUARTERS D GARAGE	460	14	1	1932		100
44	NOB QTRS B&C GARAGE	395	15	1	1928		100
50	ATOMIC CLOCK	5,349		1	2007		100
52	ADMINISTRATION BUILDING	49,922	46	3	1941		56
54	STANDBY GENERATOR BUILDING	400	17	1	1918		55
56	ADMINISTRATION BUILDING	40,953	35	2	1944		64
59	ADMIN/CAFETERIA	5,117	13	1	1943		67
61	TRANSIENT OBSERVERS HOUSE	770	18	1	1943		73
62	GARAGE ANNEX	1,224	16	1	1943		100
75	PWD BUILDING	1,025	14	1	1960		100
76	GROUNDS EQUIPMENT BUILDING	1,025	14	1	1960		68
77	AC FACILITY (50 TC)	441	14	1	1961		90
78	SIMON NEWCOMB LABORATORY	10,986	20	2	1961		69
82	TECHNICAL EQUIPMENT BUILDING	986	20	2	1970		30
83	EMERGENCY GENERATOR BUILDING	1,809	17	1	1969	1988	58
87	TELESCOPE BUILDING	158	13	1	1964		42
92	GATEHOUSE BUILDING	55	11	1	1976		95
93	GATEHOUSE BUILDING	48	11	1	1905		73
94	GATE HOUSE	60	8	1	1991		68
95	95 MORGAN LN HAZ WAST STORAGE	720	9	1	1991		94
97	34TH GUARDHOUSE(MAIN GATE)	550	18	1	1994	1997	88
99	CARPORT	434	11.25	1	1993		100
149	SALT STORAGE FACILITY	945	4.5	1	1993		100
52A	DATA PROCESSING CENTER	11,625	40	3	1993		61
A8	34TH & MASS AVE NW (POST 11)	80		1	1988		100
B C	NOB QTRS B&C F&GOQ	10,400	45	4	1897		100
B70	USSS GARAGE 1	1,920		1	2004		100
B71	USSS GARAGE	5,327	22	1	2006		100
D	NOB QTRS D F&GOQ	4,700	47	3	2000		100
F	NOB QTRS F F&GOQ	3,258	24	2	1946		100
F1	QUARTERS F GARAGE	541	12	1	1948		100
F2	QUARTERS F STORAGE SHED	141	9	1	1959		100

Source: NAVFAC Washington iNFADs, 2011.

FIGURE 3-10 EXISTING FACILITIES MAP



Installation Boundary

N

0 200 400 800

Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Building Age, Condition, and Height

The internet Navy Facility Assets Data Store (iNFADS) is the official inventory system for land, buildings, structures, and utilities owned or leased by the Navy. This system provided the basis for analyzing the building age, condition, and heights at NSF Naval Observatory. This analysis allows an understanding of current building conditions and their viability as future assets to the long-range NSF Naval Observatory Master Plan vision.

Age

NSF Naval Observatory has constructed facilities regularly over the past 150 years, which accounts for the disbursement of facility age shown in Table 3-7. Forty-two percent of facilities are more than 55 years old. However, most of the aging facilities have undergone minimal interior renovation to meet current mission requirements. The result is an inventory of structures that will continue to age as these structures continue to support current and future missions. The oldest buildings are in the central and east sections of the Installation and are associated with the initial construction and development of NSF Naval Observatory in the 1890s (Figure 3-11). Newer buildings are in the south, which is indicative of the expansion and growth of the USNO. The newest buildings resulted from the need to replace aging facilities with modernized buildings that meet the needs of current missions such as Building 50 (Atomic Clock) and Buildings 70 and 71 (USSS garages).

Condition

Content intentionally omitted

Height

The building height represents the overall elevation from the ground to the topmost portion of the structure. Building heights vary across the Installation depending on the facility function (Figure 3-13 and Table 3-9). The larger administrative facilities such as Buildings 1, 16, 52, and 56 house two or more stories of office space. These were historically RDT&E buildings retrofitted to be administrative spaces; therefore, they have taller ceiling heights per floor. Buildings 2 and 39 are tall because they are observatory towers, which require high ceilings to accommodate the observer's equipment. However, the majority of the buildings are 30 feet or less in height and primarily function as storage, community, or RDT&E functions.

TABLE 3-7 SUMMARY OF BUILDING AGE

Building Are	No. of Facilities	% of Total
4-9 Years	7	14
10-25 Years	14	28
26-55 Years	8	16
56-100 Years	13	26
101-175 Years	8	16
Total	50	100

Note: Data above are responsive only to those values currently existing in iNFADS, FRES, and GIS source data and do not account for any null values if applicable.

Source: iNFADs, 2010.

TABLE 3-8 SUMMARY OF BUILDING CONDITION

Content intentionally omitted

TABLE 3-9 SUMMARY OF BUILDING HEIGHT

Building Height	No. of Facilities	% of Total
0-30 Feet	25	53.2
31-50 Feet	13	27.7
51-100 Feet	9	19.1
Total	47	100.0

Note: Data above are responsive only to those values currently existing in iNFADS, FRES, and GIS source data and do not account for any null values if applicable.

Source: iNFADs, 2010.

Building 52 is among the tallest structures, with three stories.

FIGURE 3-11 BUILDING AGE MAP

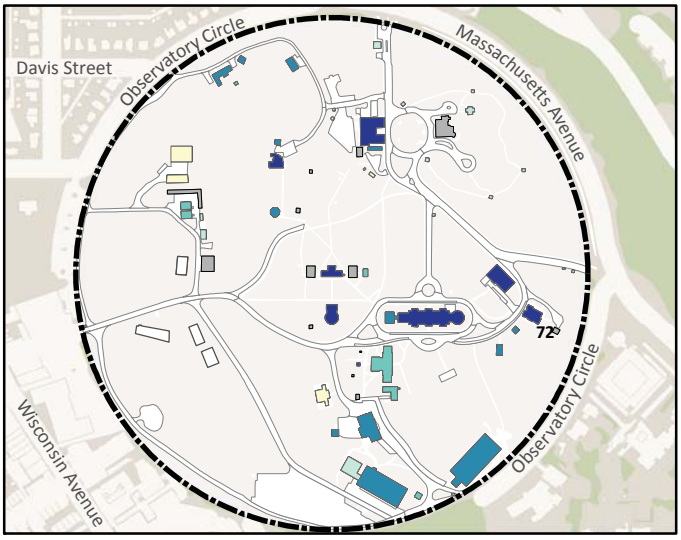
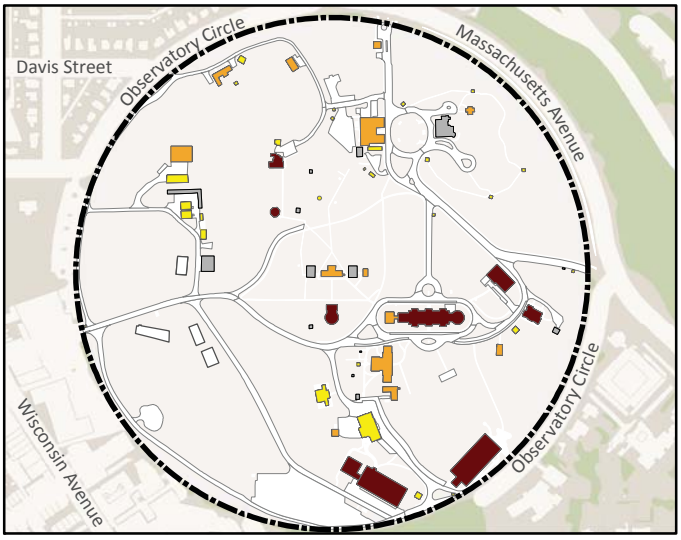


FIGURE 3-12 BUILDING CONDITION MAP

Image intentionally omitted

FIGURE 3-13 BUILDING HEIGHT MAP



Source: Washington Metropolitian Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

3.5 Major Utilities

Content intentionally omitted

Electric

Content intentionally omitted

Wastewater/Sanitary Sewer

Content intentionally omitted

Stormwater/Storm Sewer

Content intentionally omitted

FIGURE 3-14 ELECTRIC LINE CORRIDOR MAP

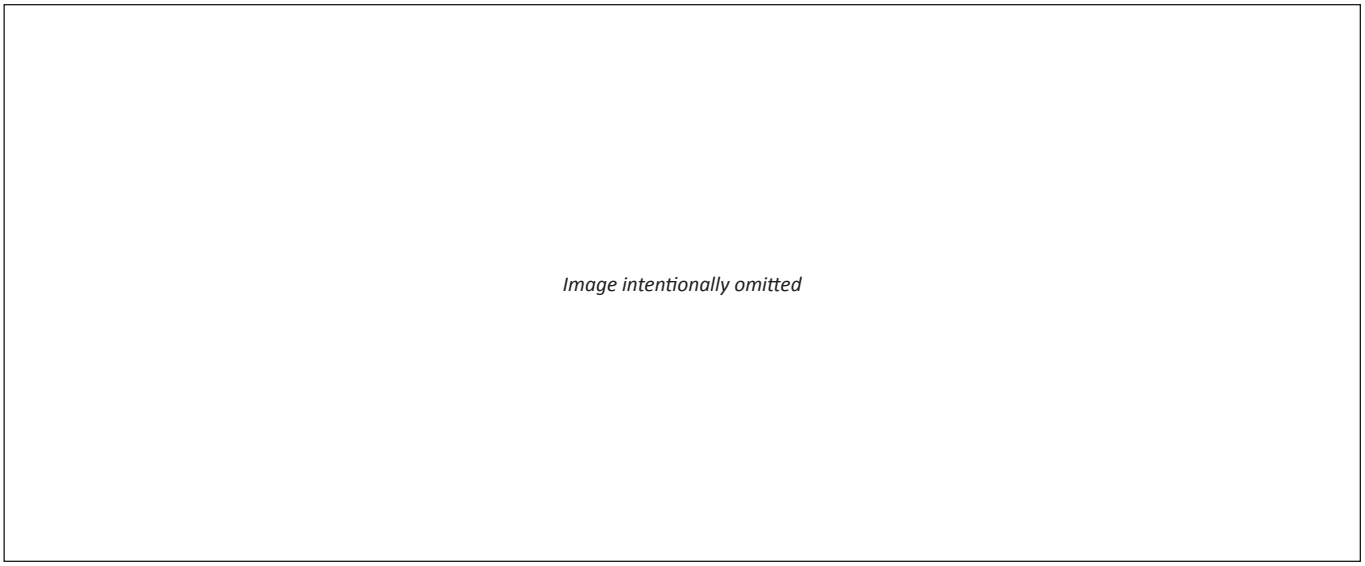


FIGURE 3-15 WASTEWATER LINE CORRIDOR MAP

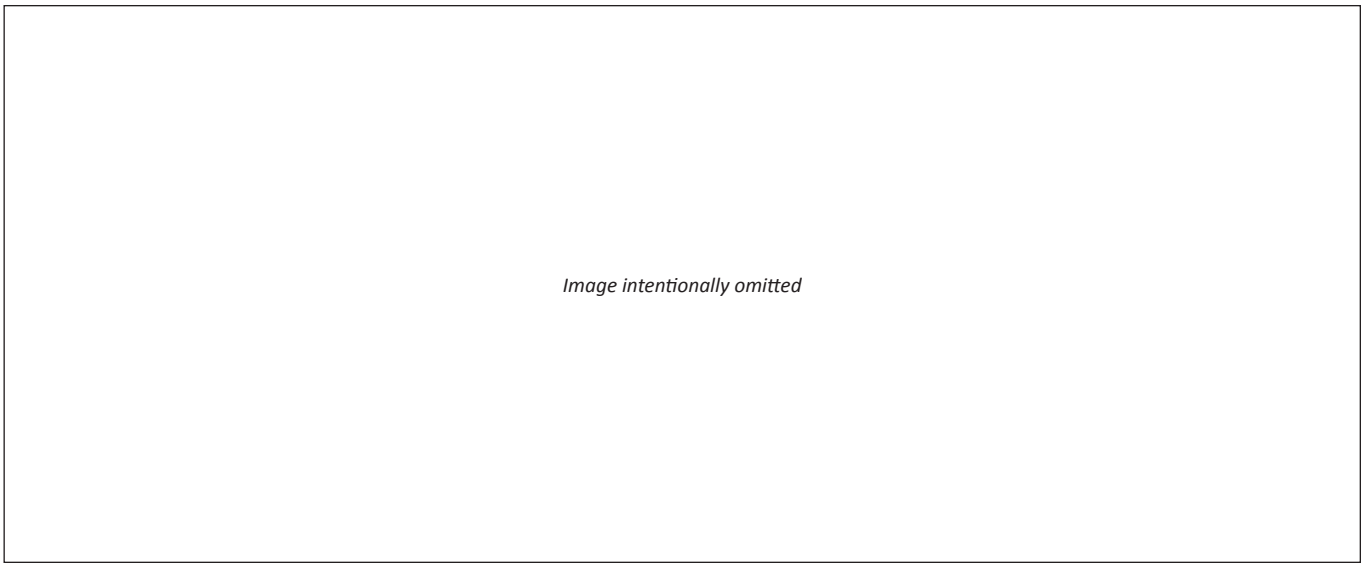
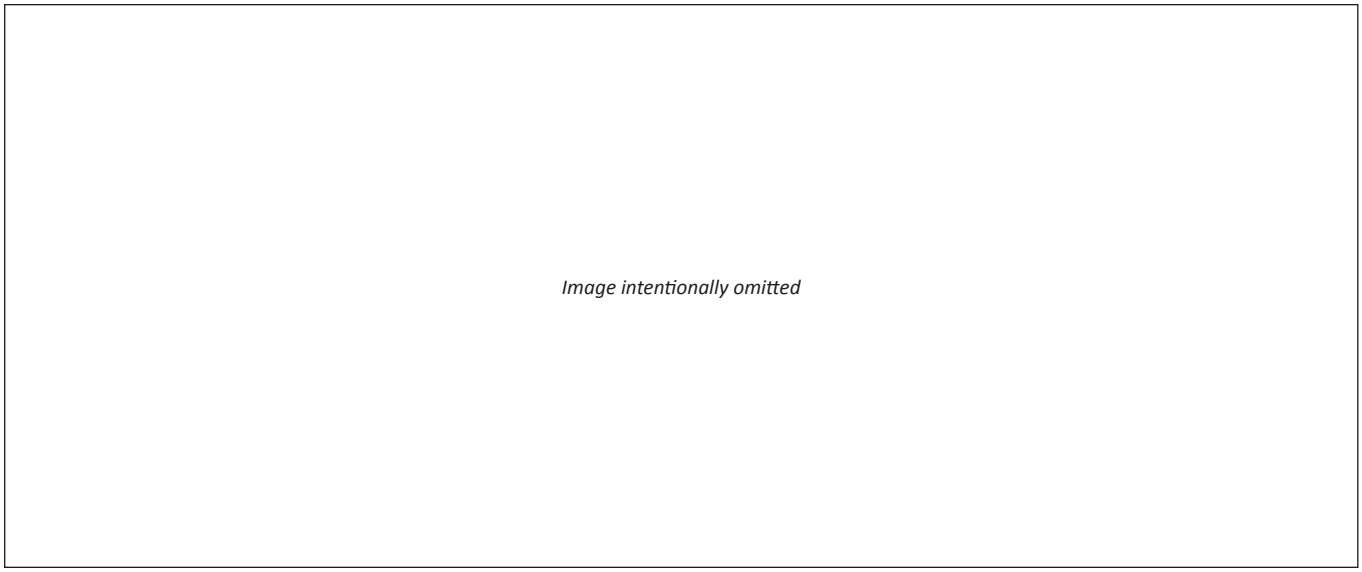


FIGURE 3-16 STORMWATER LINE CORRIDOR MAP



Water

Content intentionally omitted

Steam

Content intentionally omitted

Natural Gas

Content intentionally omitted

Heating, Ventilating, and Air Conditioning

Content intentionally omitted

Telecommunications

Content intentionally omitted

FIGURE 3-17 WATER LINE CORRIDOR MAP

Image intentionally omitted

FIGURE 3-18 NATURAL GAS LINE CORRIDOR MAP

Image intentionally omitted

FIGURE 3-19 TELECOMMUNICATION ANTENNA MAP

Image intentionally omitted

3.6 Existing Circulation Network

Surrounding Road Network

The NSF Naval Observatory is located in the northwest quadrant of Washington, D.C., and is surrounded by densely populated neighborhoods such as Woodley Park to the east, Georgetown/Burleith to the south, Glover Park to the west, and Cathedral Heights to the north. More specifically, and as depicted in Figure 3-20, the Installation lies between Massachusetts Avenue on the east and Wisconsin Avenue on the west; these avenues are both principal arterials. To the north and south, the Installation is bounded by Observatory Circle, a collector street, which is accessible via Massachusetts Avenue, Wisconsin Avenue NW, and 34th Street.

Wisconsin Avenue NW is a major thoroughfare in Washington, D.C., and Maryland suburbs. It runs through the District neighborhoods of Glover Park (next to NSF Naval Observatory), Burleith, Cathedral Heights, Cleveland Park, Tenleytown, and Friendship Heights. The National Highway System classifies the Wisconsin Avenue/Rockville Pike corridor as an arterial route from M Street to the Beltway. Along this nine-mile urban segment, several transit services can be found, including several Metrorail (Metro) stations along the Red Line (Tenleytown-AU Metro, two miles away), Metrobus, D.C. Circulator, and Montgomery County's Ride On bus services.

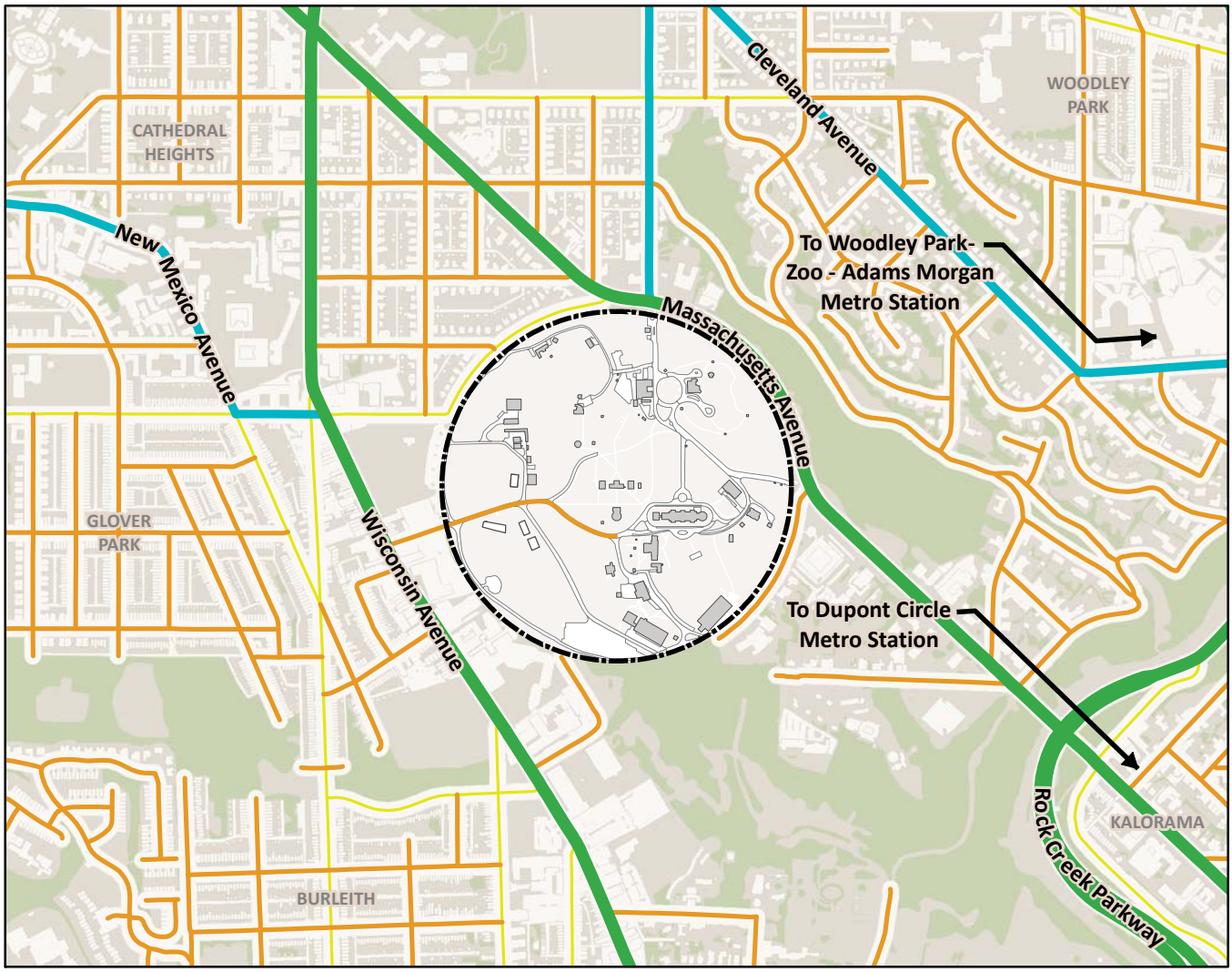
Massachusetts Avenue is a major thoroughfare that diagonally transverses Washington, D.C. It is the longest thoroughfare in the capital, crossing three of its four quadrants and intersecting every major north–south corridor. From Dupont Circle, Massachusetts Avenue runs northwest through the District neighborhoods of Kalorama, Woodley Park (next to NSF Naval Observatory), Cathedral Heights, McLean Gardens, and American University Park. Along this six and one half-mile-long segment are several transit services including the Dupont Circle Metro along the Red Line (one and one half miles to NSF Naval Observatory), Metrobus, and Montgomery County's Ride On bus services.

Wisconsin Avenue in Cathedral Heights is several blocks north of the Washington National Cathedral and in the vicinity of NSF Naval Observatory.

Massachusetts Avenue is located directly east of NSF Naval Observatory.

Observatory Circle leads to the South Gate of the Installation and is lined with Embassies including the British Embassy on the left.

FIGURE 3-20 REGIONAL TRANSPORTATION NETWORK



Installation Boundary
Principal Arterial
Minor Arterial
Local Road
Collector Road

N

0 360 720 1,440
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Davis Road is a primary roadway linking the South Gate with the center of the Installation.

The Main Gate along Massachusetts Avenue is used by the USSS only.

Internal Road System

Given its topography and clustered development to the south, NSF Naval Observatory has largely maintained the rural nature of its origins. Subsequently, its internal road system is limited and largely concentrated toward the southeastern quadrant of the circle. This installation transportation network includes the following roads (as depicted in Figure 3-21):

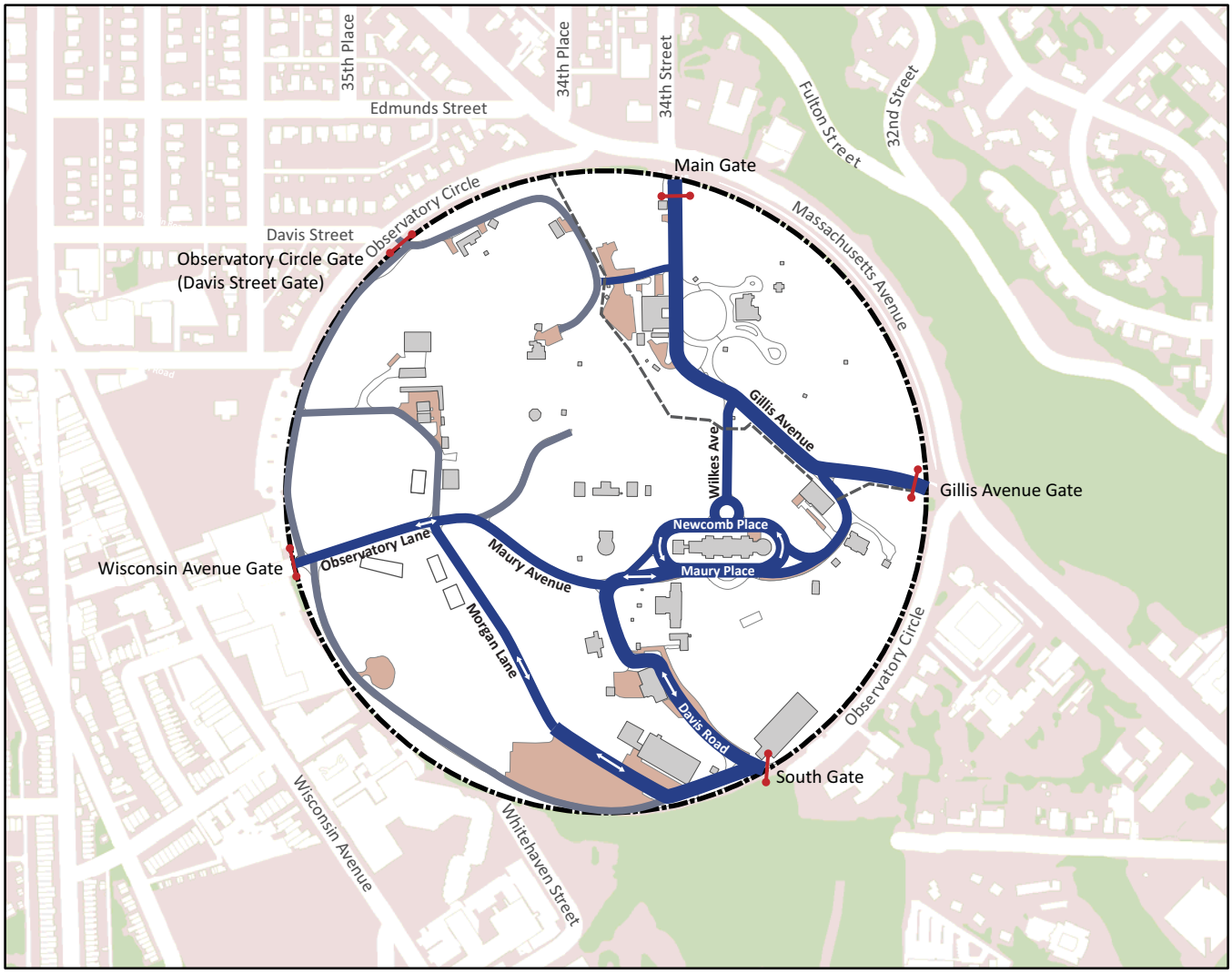
- **Primary Vehicular Roads:** the early section of Morgan Lane through the main employee parking area, Davis Road, Maury Place, and Newcomb Place are considered the primary circulation roads. These roads provide access to the main employee parking area and the main employment centers.
- **Secondary Vehicular Roads:** Observatory Lane, Maury Avenue, Morgan Lane, Wilkes Avenue, and the restricted Gillis Avenue provide internal vehicular secondary circulation, which is largely limited to deliveries and security patrols.
- **All Other Roads:** Garden Lane, Rodgers Lane, Hill Road, and Golds Borough are considered service and access roads.

Ingress/Egress Points

Five perimter gates exist at the NSF Naval Observatory, but only two gates are actively used for access to the Naval Observatory portion of the installation. Two gates, Gillis Avenue Gate and the Main Gate, are located along Massachusetts Avenue and provide restricted access to the Residence of the Vice President of the United States only. The Observatory Circle Gate (Davis Street Gate), located at the intersection of Observatory Circle and Davis Street, is closed to vehicles and pedestrians.

- **South Gate:** serves as the primary entry point for Navy employees, service, and visitors. It is staffed by a security guard and provides both vehicular and pedestrian access to the installation. Via Morgan Lane, it leads to the installation's main parking lot (next to Building 52). South Gate is located approximately 900 feet from Massachusetts Avenue along the uphill and dead-end roadway of Observatory Circle, a local road maintained by the District Department of Transportation (DDOT). The South Gate is also located adjacent to Dumbarton Oaks Park where informal trails run from Whitehaven Street to either Massachusetts Avenue (in the southeast) or Wisconsin Avenue (in the southwest). As part of the Navy's AT/FP Ashore Program, this gate is slated for modernization by installing new heavy duty vehicle barriers and an inspection area, as well as upgrading the guardhouse, bollards, light poles, signs, and a camera system.
- **Wisconsin Avenue Gate:** serves as a secondary entry point to Navy employees because it provides only pedestrian access and limited vehicle access. The gate is accessed by an alley, approximately 300 feet off of Wisconsin Avenue, and is not visible from the roadway. It is unmanned and accessible to pedestrians by a revolving security gate operated with a security badge reader. Vehicular access is possible but only when the gate is opened for special and restricted uses. As part of the Navy's AT/FP Ashore Program, this gate is also slated for modernization by providing an automated gate with two tilt-a-way gates, loop detectors (in the pavement), five bollards, traffic signage, and security cameras.

FIGURE 3-21 INSTALLATION TRANSPORTATION NETWORK



- Installation Boundary
- Parking Areas
- Perimeter Gates (Access Control Points)
- Primary Roads
- Secondary Roads
- Tertiary/Service Roads
- Residence of the Vice President of the United States Fence

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

The D.C. Circulator provides transit service to Wisconsin Avenue, south of NSF Naval Observatory.

Parking

A parking survey conducted in March 2011 revealed 325 parking spaces on NSF Naval Observatory, excluding the Residence of the Vice President of the United States and USSS buildings. Of the 325 spaces, 305 are non-restricted employee spaces, 12 are restricted government spaces, and 8 are restricted handicapped spaces. Only 313 of the total amount are considered employee spaces (non-restricted employee and restricted handicapped). The parking survey revealed an overall parking occupancy of 67 percent for the non-restricted employee spaces where availability is on a first-come-first-served basis. With the current population of 314 personnel, and a total of 313 employee parking spaces, the parking ratio of employee to space is 1:1.00.

Public Transit and Shuttle Buses

Overall, the region surrounding NSF Naval Observatory is served by local and regional transit modes, including the Metro (Red Line) (Figure 3-22); Metrobus, and D.C. Circulator. As depicted in Figure 3-23, NSF Naval Observatory is served directly by only two local bus corridors:

- **Massachusetts Avenue with Metrobus 37, N2, N3, N4, and N6** with bus stops near either the Gillis Avenue Gate or the Main Gate at 34th Street. These are all within reasonable walking distance (about 1,000 feet or a five-minute walk) from the Installation.
- **Wisconsin Avenue with Metrobus 36, 31, and 32** with bus stops near the alley to the Wisconsin Avenue Gate. These are all within a walking distance of about 1,000 feet or a five minute walk from the Installation. Metrobus 36 is the only bus route that connects into Montgomery County, Maryland. The D.C. Circulator (Georgetown-Union Station) also provides service to Wisconsin Avenue and actually terminates at Whitehaven Street, just to the south of NSF Naval Observatory.

The nearest Metro station is the Woodley Park station, but it is far from NSF Naval Observatory, with a one and one half-mile distance, or a 30-minute walk, from the South Gate. This walk, however, is cumbersome because the area lacks continuous sidewalks and is not directly connected.

A paved pedestrian path connects Building 1 and Building 56.

Pedestrian and Bicycle Facilities and Amenities

Within NSF Naval Observatory are several pedestrian sidewalks alongside vehicular circulation routes and pedestrian pathways. They all serve as the primary mode of transportation for Installation personnel during work hours. However, internal access to such pedestrian pathways is sometimes an issue due to steep topography throughout the Installation. No designated bicycle lanes or racks are present on the Installation.

Outside NSF Naval Observatory, both Massachusetts Avenue and Wisconsin Avenue provide pedestrian and bicycle access to the Installation. A dedicated bicycle route (on the sidewalk) is along Massachusetts Avenue. None of the other roadways have dedicated bicycle lanes. As depicted on Figure 3-24, the District Department of Transportation Capital Bikeshare has two stations located adjacent to and within walking distance of NSF Naval Observatory:

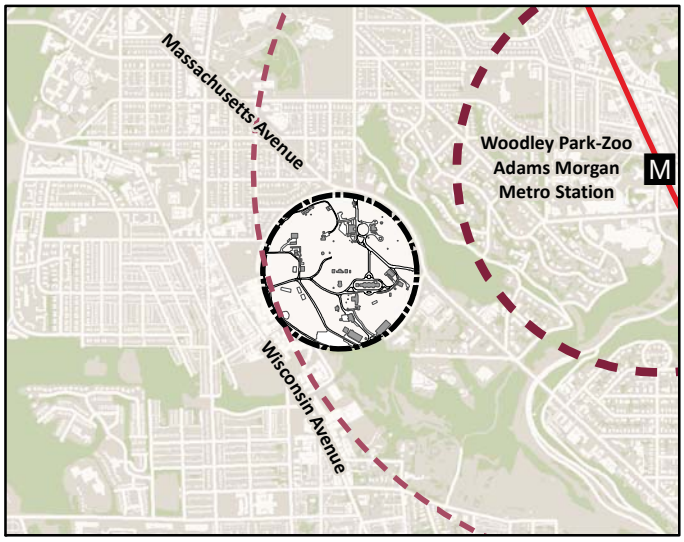
- 36th and Calvert Streets/Glover Park with 15 bicycle racks
- 34th Street and Wisconsin Avenue with 14 bicycle racks

Emergency Services

The Military Police Department currently shares Building 59 with the Stargazer Cafe. They provide police and emergency services to the Installation and work with the District of Columbia's Metropolitan Police Department - Second District to provide services to the immediate area surrounding the Installation. The Installation falls within the boundaries for the 204th Police Service Area. The nearest police station to the Installation is one and one third miles to the north on Idaho Avenue NW.

Fire prevention and emergency services are provided by the District of Columbia Fire and Emergency Services Department. The nearest fire station is Engine 28 Station on Connecticut Avenue NW, one and two-third miles north of the Installation. NSF Naval Observatory does not currently have a dedicated fire department.

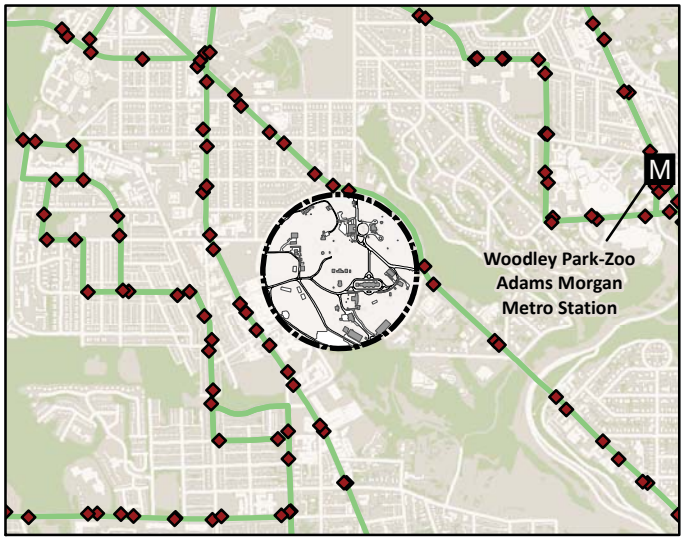
FIGURE 3-22 METRO STATION MAP



M Metro Station

Installation Boundary

FIGURE 3-23 BUS ROUTES MAP



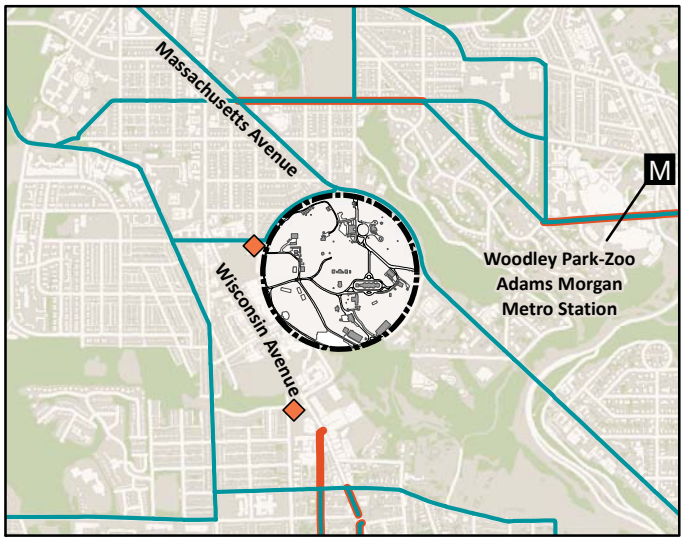
M Metro Station

Bus Stops

Installation Boundary

WMATA Bus Lines

FIGURE 3-24 BICYCLE ROUTES MAP



Capital Bikeshare Locations

Installation Boundary

M Metro Station

Signed Bicycle Route

Bicycle Lane

N

0 500 1,000 2,000

Feet

Source: Washington Metropolitian Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

4.0 Framework Plan

4.1 Overview

This chapter presents the framework plan which provides an adaptable blueprint to control, coordinate, and direct change. Arriving at this plan involves developing planning strategies, creating a framework plan and establishing a future land use plan. Each step builds upon the former to provide direction for achieving the overall vision for the installation. The process occurs in the following sequential steps:

- **Planning Considerations**: understand the opportunities and constraints posed by existing conditions, and the potential future issues presented in the previous chapters.
- **Planning Strategies:** examines Installation-wide planning systems and determines how they can be shaped to accommodate future capacity.
- **Framework Plan**: synthesizes the planning strategies into an overall plan that serves as the long-range master plan.
- **Land Use Plan**: describes what land use changes will be needed to accommodate the future population and proposed projects. It is derived from a broad directive given at a regional-level.

4.2 Planning Strategies

Planning strategies are the basis of the future plan for the installation. They take the issues mandated by the guiding principles and give physical form to those objectives. The planning strategies presented in this section focus on major infrastructure and planning systems that include:

- Roadway Circulation and Parking
- Development Parcels
- Activity Hubs
- Multimodal Circulation
- Open Space and Pedestrian Circulation
- Security Enhancements
- Energy
- Stormwater Management

Each planning strategy is then measured by the guiding principles to ensure objectives are met. Each principle is summarized in the following table:

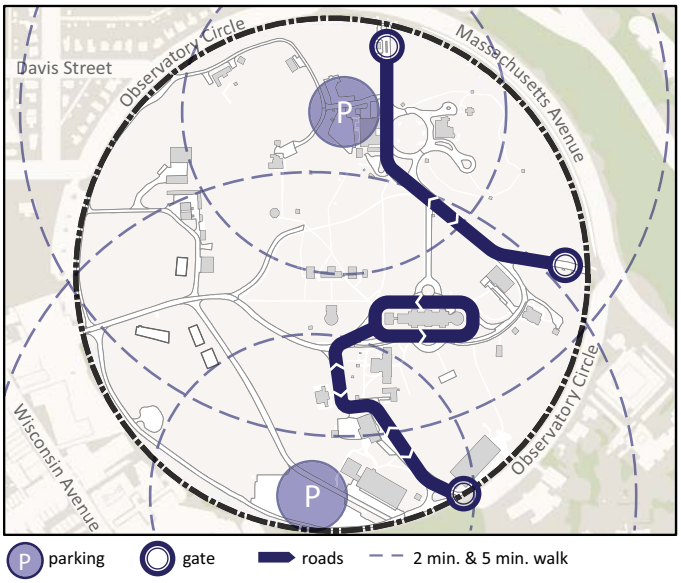
TABLE 4-1 GUIDING PRINCIPLES KEY

Icon	Guiding Principle
	Compact Development
	Infill Development
	Circulation Networks
	Horizontal Development
	Vertical Development
	Sustainable Landscape Elements
	Low Impact Development and Stormwater Management
	Configuration and Utilization
	Energy Conservation and Production
	Lifecycle / Mitigation Planning

Roadway Circulation and Parking

The strategies presented here propose to maintain the current road and parking network. The Roadway Circulation and Parking Network Plan (Figure 4-2) is based on the following strategies shown in the table below.

FIGURE 4-1 FUTURE CONCEPTUAL ROADWAY CIRCULATION AND PARKING STRATEGIES (OVERLAID ON EXISTING CONDITIONS)

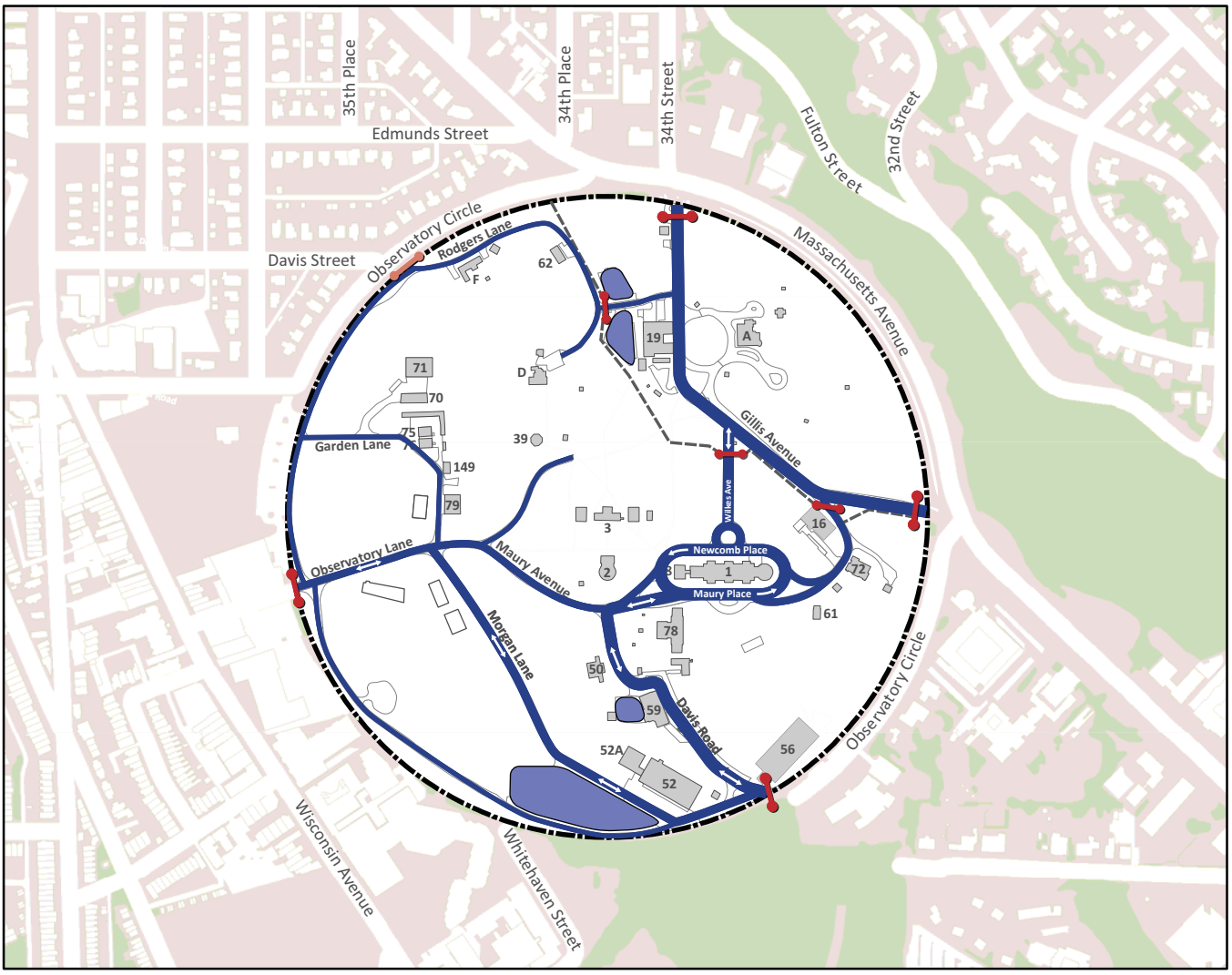


Two primary roads with separate gates provide two means of access: one to NSF Naval Observatory buildings and the other to the Residence of the Vice President of the United States and USSS buildings.

TABLE 4-2 ROADWAY CIRCULATION AND PARKING STRATEGIES MATRIX

Strategies										
Maintain the current network and hierarchy of streets within the Naval Observatory, including Davis Road and the loop around Building 1 (Newcomb Place and Maury Place) as the primary roads.	✔	✔	✔	✔		✔		✔		✔
Content intentionally omitted										
Maintain parking areas where they currently exist without adding any additional parking.	✔	✔	✔			✔		✔		✔
Implement improvements to modernize Wisconsin and South Gate with new vehicle barriers, lighting inspection area, as well as guardhouse, signs, and camera system.	✔	✔	✔					✔		
Ensure lighting for streets parking lots, and entry gates meet the UFC design manual , the IES handbook illuminance level recommendations, and other guidance for minimizing light pollution.	✔	✔		✔				✔		✔
Consider structured parking in the long term to accommodate displaced surface lots that are potential development sites.	✔	✔			✔			✔		✔

FIGURE 4-2 FUTURE ROADWAY CIRCULATION AND PARKING STRATEGIES PLAN



Installation Boundary
Roads
Operational Gates
Closed Gate
Existing Primary Parking Areas
Residence of the Vice President of the United States Fence

N

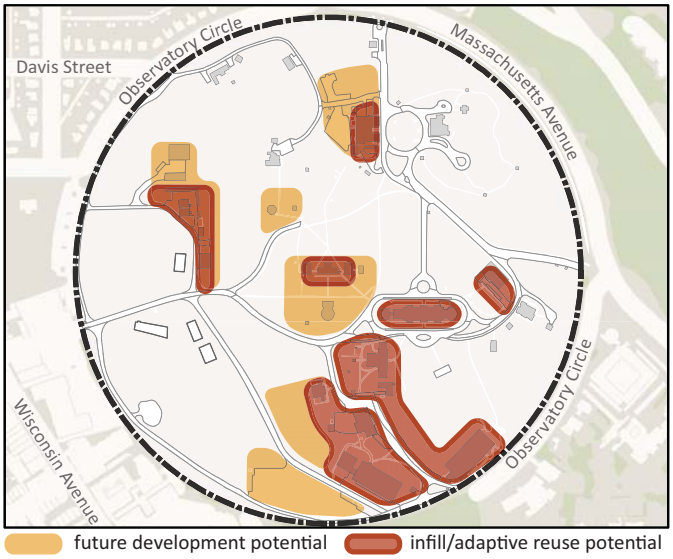
0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Development Parcels

The development parcel strategies build upon the bucolic setting that is typical of the installation. If and when there is a need to expand facilities, the areas designated here are the most ideal locations for development to occur (Figure 4-4). These areas maintain land use patterns and direct development toward compact clusters of buildings that best preserve as much of the scenic landscape that is valued at NSF Naval Observatory. The Development Parcel Strategies Plan is based on the following strategies shown in the table below.

FIGURE 4-3 FUTURE CONCEPTUAL DEVELOPMENT PARCELS STRATEGIES (OVERLAID ON EXISTING CONDITIONS)

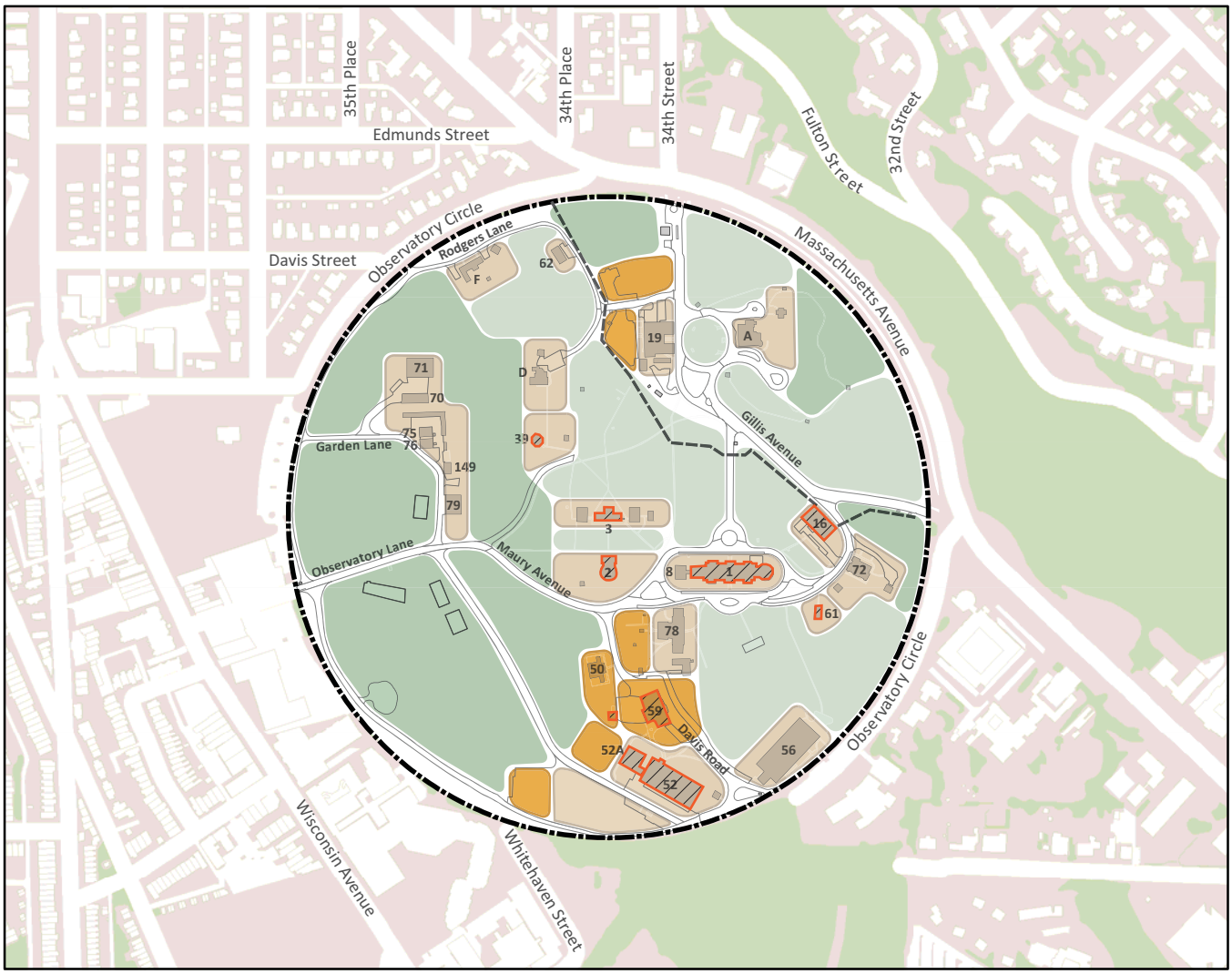


Development parcels are irregular in shape in response to the topography of the site. Future development shall focus growth within the highlighted areas. Key parcels in red are particularly suitable for infill development or adaptive reuse of historic buildings.

TABLE 4-3 DEVELOPMENT PARCELS STRATEGIES MATRIX

Strategies										
Focus growth as infill, redevelopment, or renovation to encourage compact development within development parcels.	✔	✔						✔		✔
Practice sensitive construction practices that mitigate impacts to the observational mission activities, particularly in areas south of the observatories where equipment maintains a southern look angle.				✔				✔		✔
Adaptive reuse or expansion of Building 16 can preserve architectural resources and provide space for necessary mission functions.	✔	✔			✔		✔	✔		✔
Renovate existing facilities that can still serve as viable facilities for similar or new uses (Buildings 3 and 78).	✔	✔					✔	✔		✔
Backfill buildings that have vacant space that can be repurposed for similar or new uses (Building 56).		✔					✔	✔		✔

FIGURE 4-4 FUTURE DEVELOPMENT PARCELS STRATEGIES PLAN



Installation Boundary

Developed Parcels to be Retained or Renovated

Potential Parcels for New Development/Redevelopment

NRHP Contributing Structure

Reserved Open Space: Predominantly Lawn

Reserved Open Space: Predominantly Trees

Residence of the Vice President of the United States of America Fence

N

0 200 400 800

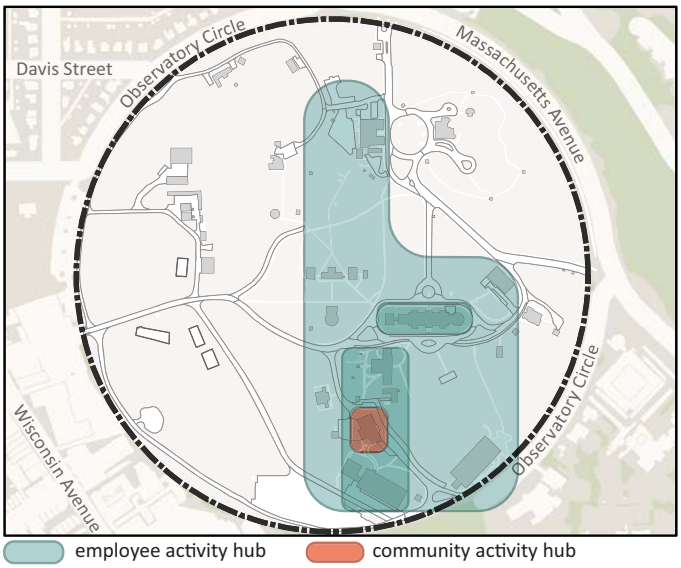
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Activity Hubs

Activity hubs are concentrated areas of primary mission functions where most people congregate. These areas include employment hubs and community hubs. The highlighted hubs on NSF Naval Observatory relate to primary areas of RDT&E facilities and community service facilities as depicted in Figure 4-6. The Activity Hubs Plan is based on the following strategies shown in the table below.

FIGURE 4-5 FUTURE CONCEPTUAL ACTIVITY HUB STRATEGIES (OVERLAID ON EXISTING CONDITIONS)

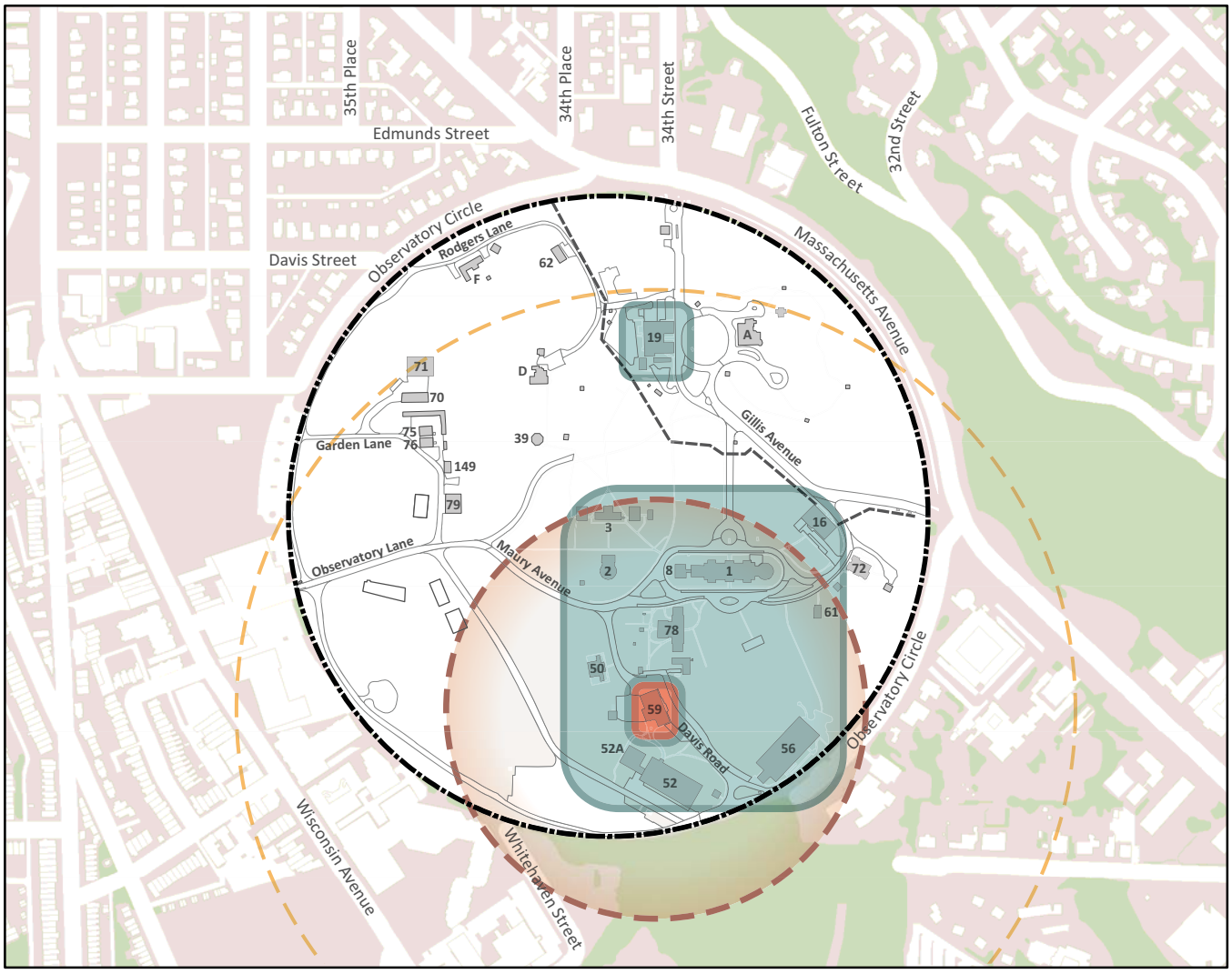


The highest concentration of employment activities is near the central and southern portions of the Installation.

TABLE 4-4 ACTIVITY HUBS STRATEGIES MATRIX

Strategies										
Concentrate redevelopment of existing facilities or infill new construction within existing employment hubs to further densify developed areas and maintain building clusters.	✔	✔		✔				✔		✔
Expand and/or relocate base support activities in the long term from Building 59 to a new facility if the current building is beyond its life cycle.	✔	✔		✔				✔		✔
Utilize Building 56 as expansion space when tenants undergo growth and expansion, when functions and people relocate, or as swing space.	✔	✔		✔				✔		

FIGURE 4-6 FUTURE ACTIVITY HUBS STRATEGIES PLAN



Installation Boundary
Employment Hubs
Community Hubs
2.5-Minute Walking Distance- Community
5-Minute Walking Distance - Community
Residence of the Vice President of the United State Fence

N

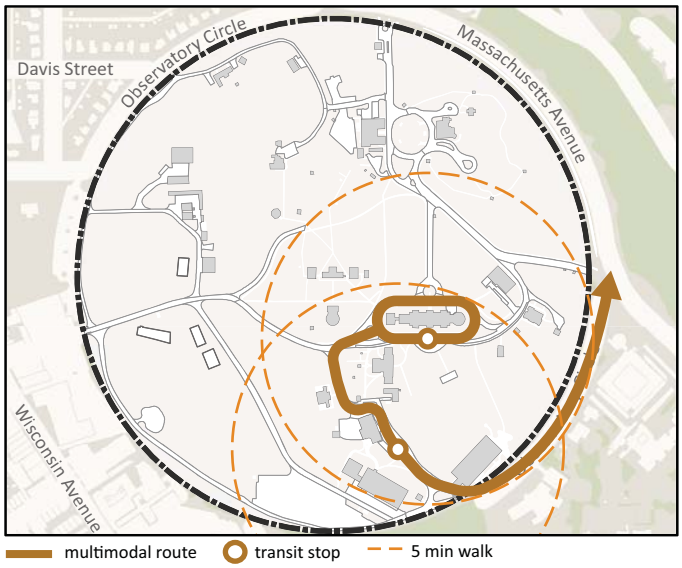
0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Multimodal Circulation

The multimodal transit strategies seek to incorporate various types of shuttle and bicycle services to encourage alternative means of commuting. The ultimate goal is to build upon the existing transit systems with linkages for efficient and reliable alternatives to the car (Figure 4-8). The Multimodal Circulation Plan is based on the following strategies shown in the table below.

FIGURE 4-7 FUTURE CONCEPTUAL MULTIMODAL STRATEGIES (OVERLAID ON EXISTING CONDITIONS)



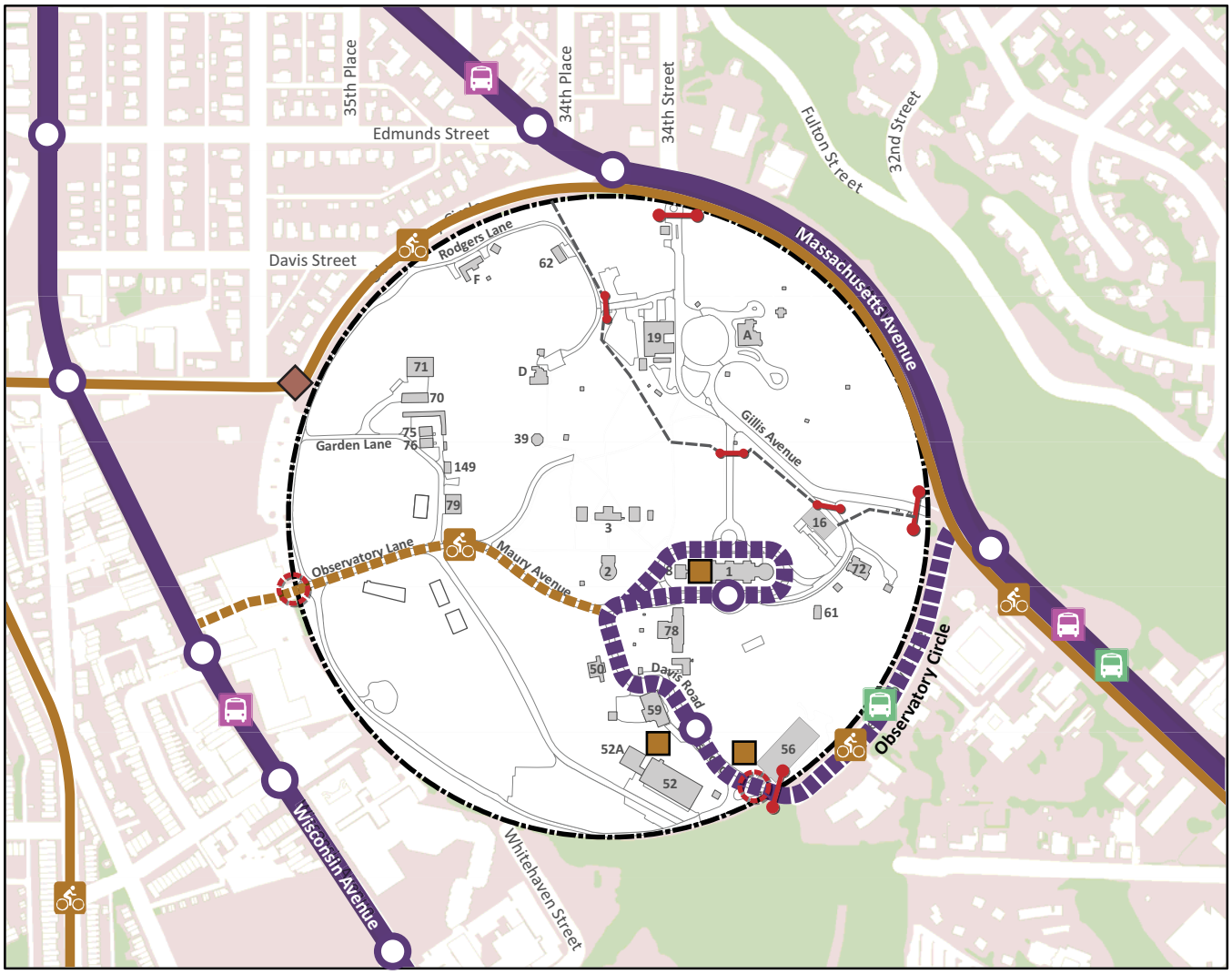
A single loop along Davis Road and around Building 1 forms the primary multimodal corridor for the Installation. Two stops provide access to most facilities within a two-minute walking arc.

TABLE 4-5 MULTIMODAL CIRCULATION STRATEGIES MATRIX

Strategies										
Establish a dedicated shuttle to service main activity hubs along Davis Road and Building 1.		✔	✔	✔				✔	✔	✔
Expand shuttle service by providing more frequent trips to other DoD installations.			✔					✔	✔	✔
Create a wayfinding signage system that identifies and encourages use of transit.			✔							✔
Expand bicycle access that includes designated routes, sheltered bicycle storage, perimeter gate access, and shower/locker rooms.		✔	✔	✔				✔	✔	✔
Improve the installation gate nearest Wisconsin Avenue for better pedestrian and bike accessibility. Coordinate with local community, property owners, and city in determining the types of access/ visibility improvements needed from Wisconsin Avenue, and their implementation.*			✔					✔	✔	✔

* Because this strategy requires feasibility studies and funding acquisition which are undetermined at this time, this strategy is not shown on the development program project list within the timeline of this master plan.

FIGURE 4-8 FUTURE MULTIMODAL CIRCULATION STRATEGIES PLAN



- Installation Boundary
- Existing Multimodal Corridor and Stops
- Proposed Multimodal Corridor and Stops
- Operational Gates
- Pedestrian and Bicycle Gates
- Public Transit
- DoD Designated Shuttle
- Exisiting Bicycle Routes
- Proposed Bicycle Routes
- Bicycle Storage
- Capital Bikeshare Station
- Residence of the Vice President of the United States Fence

N

0 200 400 800
Feet

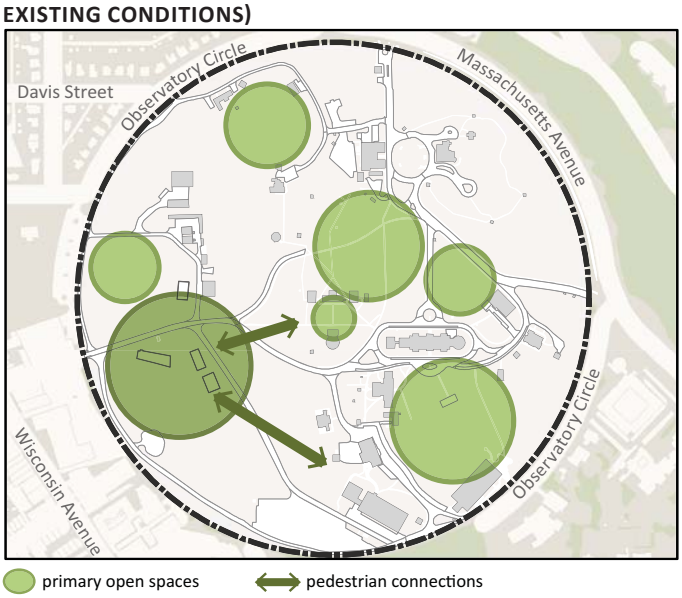
Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Open Space and Pedestrian Circulation

As a strategy to continue USNO's critical missions, significant amounts of green space have been preserved to maintain the bucolic landscape that is so important to the character and function of the installation. These areas of vegetation mitigate the effects of light and heat on astronomical observation activities from the surrounding urban development. Woodland patches occur along the perimeter and are scattered throughout the western section of the installation.

The open space strategies work to preserve the forested areas and lawns that create a scenic setting for the buildings and buffer mission activities from the surrounding encroachments (Figure 4-10). Linking open spaces with pedestrian corridors enables them to become an integrated community asset. The Open Space and Pedestrian Circulation Network Plan is based on the following strategies shown in the table below.

FIGURE 4-9 FUTURE CONCEPTUAL OPEN SPACE AND PEDESTRIAN CIRCULATION STRATEGIES (OVERLAID ON EXISTING CONDITIONS)

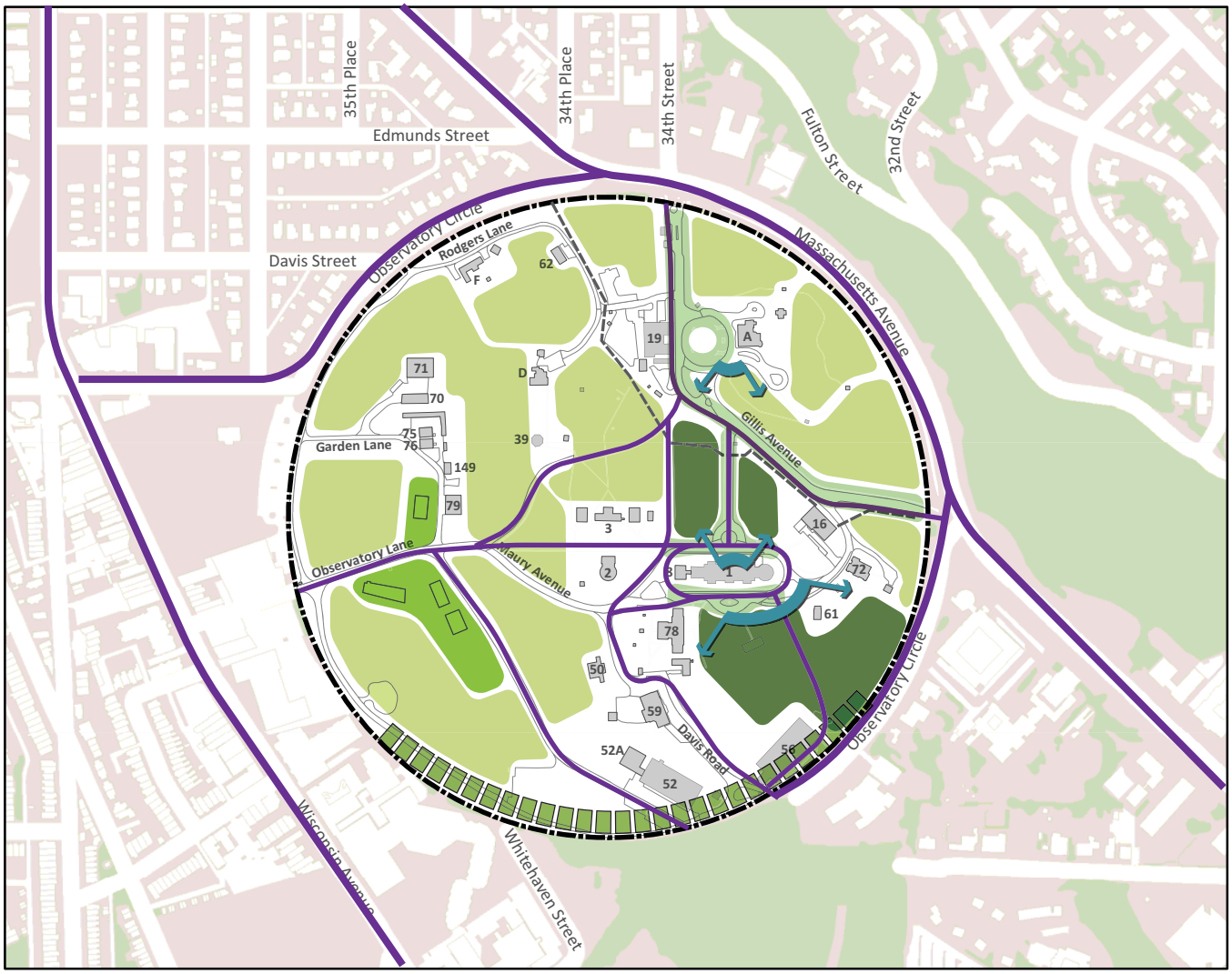


Active recreation is clustered in one area toward the western edge and needs good pedestrian access. Passive open spaces are well distributed throughout the installation.

TABLE 4-6 OPEN SPACE AND PEDESTRIAN CIRCULATION STRATEGIES MATRIX

Strategies										
Preserve open lawn areas to maintain the historic character and setting of the installation.				✔		✔				
Improve pedestrian walkways by ensuring a continuous network that is separated from vehicular routes.			✔	✔		✔			✔	✔
Preserve natural, open spaces to serve an environmental function for stormwater management.						✔	✔			
Line roadways and pedestrian corridors with appropriate tree and plant species to reinforce road hierarchy and increase habitat.				✔		✔	✔			✔
Follow the recommended plant species and material listed in the IAP and INRMP.						✔				
Develop a vegetation plan to maintain and reinforce vegetative buffers along the fence line and adequate tree cover throughout the installation in order to mitigate the effects of light pollution and urban encroachment. Improve vegetative buffer along the southern boundary to mitigate light trespass from outside the installation.						✔		✔		
Encourage the selection of plants that are low-maintenance, drought-tolerant, and/or native species.						✔			✔	✔
For all areas of high visibility, use a more formal and decorative planting treatment to communicate the prominence and importance of the location and to establish a visual hierarchy throughout the installation.						✔				✔
Aim to eliminate invasive species over time.						✔				

FIGURE 4-10 FUTURE OPEN SPACE AND PEDESTRIAN CIRCULATION STRATEGIES PLAN



- Installation Boundary
- Natural Areas
- Active Recreation Facilities
- Ceremonial Green Spaces
- Street Tree Planting
- Primary Pedestrian Routes
- Vegetative Buffer
- Operational Gates
- Residence of the Vice President of the United States Fence
- Viewsheds

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Security Enhancements Strategies

Content intentionally omitted

FIGURE 4-11 FUTURE CONCEPTUAL SECURITY ENHANCEMENT STRATEGIES (OVERLAID ON EXISTING CONDITIONS)

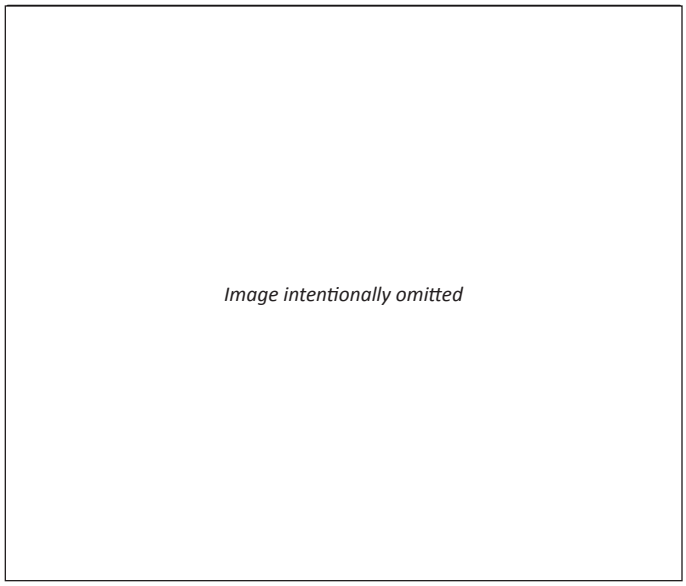


TABLE 4-7 SECURITY ENHANCEMENTS STRATEGIES MATRIX

Content intentionally omitted

FIGURE 4-12 FUTURE SECURITY ENHANCEMENTS STRATEGIES PLAN

Energy Strategies

The Navy is mandated by many executive orders, policies, and regulations to reduce energy consumption. Planning strategies presented here identify areas and facilities that could support energy conservation and/or production. The strategies listed in Table 4-8 present opportunities that will need further study to determine how they might be implemented as shown in Figure 4-13.

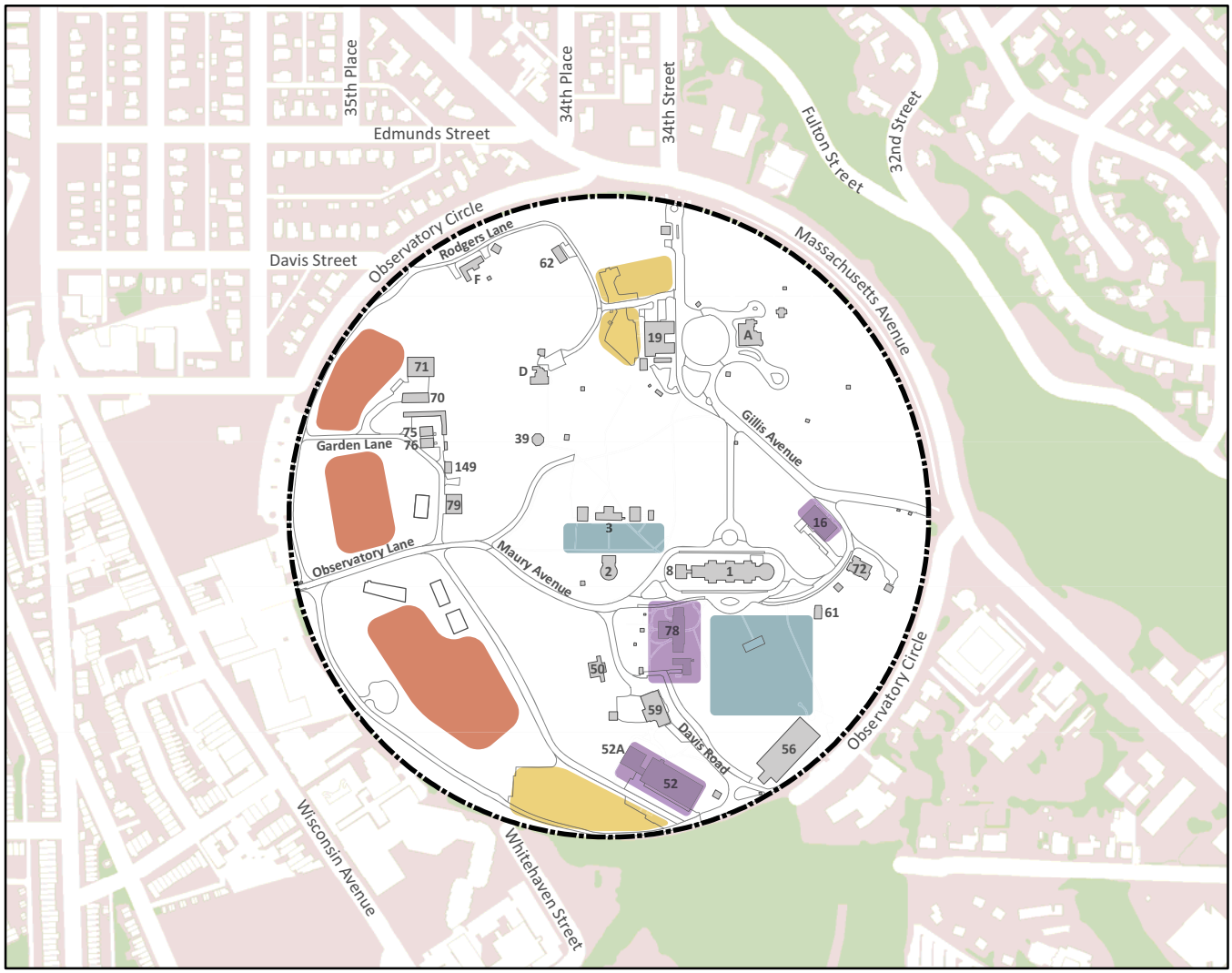
Photovoltaic technologies can be incorporated into roofs so as to increase the productivity and functionality of limited land resources.

TABLE 4-8 ENERGY STRATEGIES MATRIX

Strategies										
Encourage new construction or renovation projects to meet the highest Leadership and Energy and Environmental Design (LEED) standards as possible, and incorporate innovative technologies for low impact development and energy production..		✔					✔			✔
Identify areas for geothermal systems that can be centrally located to service multiple buildings for better efficiencies in heating/ cooling.									✔	✔
Incorporate renewable energy generation into new construction or renovation of existing buildings. Innovative building materials can also be incorporated to conserve energy and decrease heat island effect.									✔	✔
Implement renewable energy generation in areas away from historic buildings and viewsheds to minimize visual impacts.				✔					✔	
Install energy production systems such as car shelters that support photo-voltaic collectors (see image this page) within the South Lot.*		✔		✔				✔	✔	✔

* Because this strategy requires feasibility studies and funding acquisition which are undetermined at this time, this strategy is not shown on the development program project list within the timeline of this master plan.

FIGURE 4-13 FUTURE ENERGY STRATEGIES PLAN



Installation Boundary
Geothermal Opportunity
Sustainable Energy Opportunity Areas
Existing Building Improvement Opportunities
New LEED, LID, and Energy Production Opportunity Areas

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

Stormwater Management Strategies

The Navy is mandated by executive orders, federal/local laws, and other regulations to implement runoff controls of stormwater. The future planning strategies identify areas where various systems for stormwater management can occur. With the long-term reduction in impervious pavement, such systems become viable as space becomes available to implement the strategies listed in Table 4-9. Further study will be needed to determine how they might be implemented, as shown in Figure 4-14.

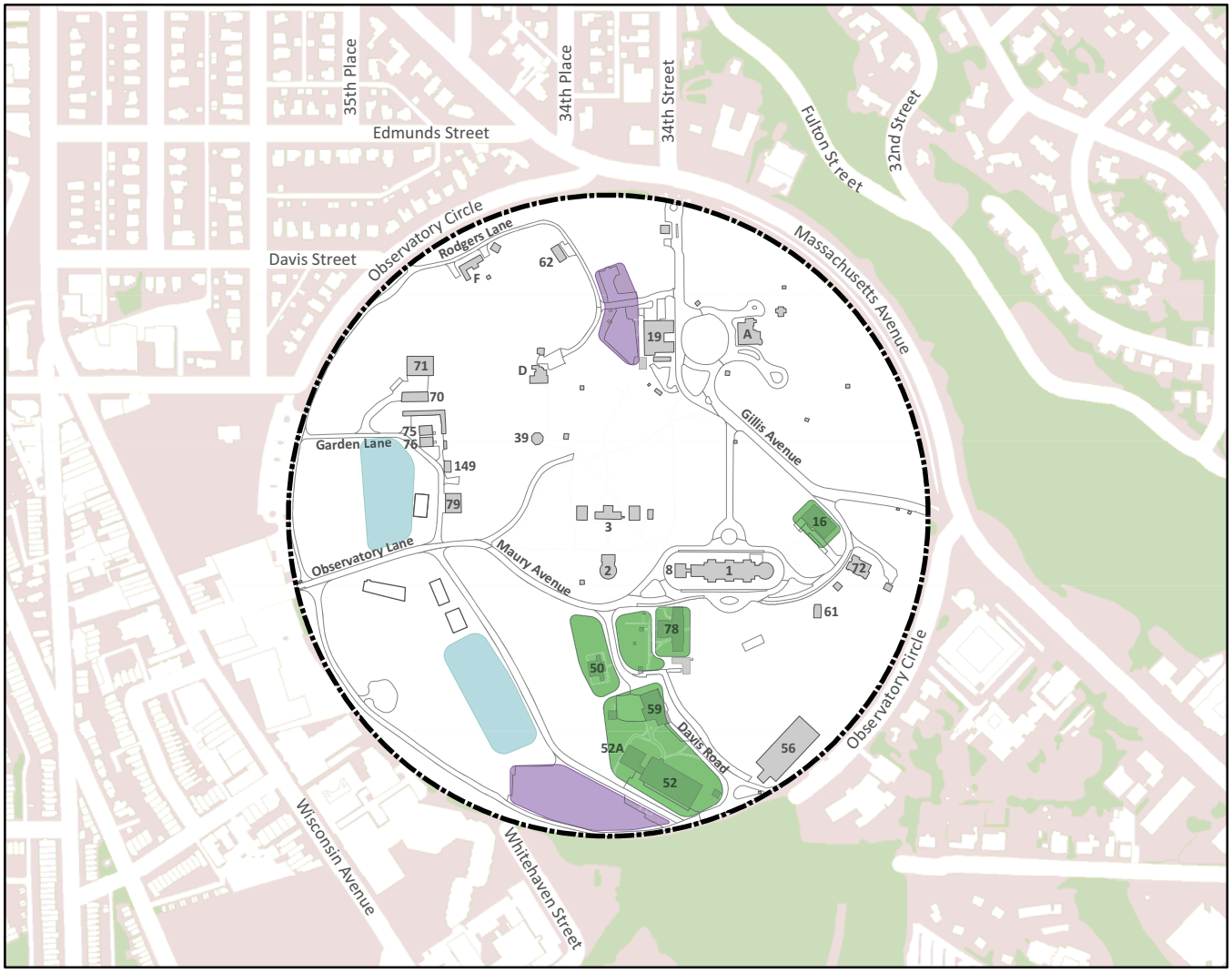
The incorporation of bioswales in parking islands reduces surface runoff and improves the visual appearance of parking lots.

TABLE 4-9 STORMWATER MANAGEMENT STRATEGIES MATRIX

Strategies										
Provide rain gardens or other bioretention areas within open spaces and parking lots to increase the ability to retain and filter stormwater runoff.						✔	✔			✔
Retrofit existing buildings with green roofs when possible, or plan such a roof system for new construction. This will enabling greater runoff reductions and water filtration for the entire installation.						✔	✔			✔
Retrofit surface parking lots with underground retention systems and pervious pavements.							✔	✔		✔
Capture rainwater from rooftops within cisterns to be used in grey water applications such as toilets and landscape irrigation.							✔			✔
Consider reducing the size of South Lot to accommodate future development and reduce impervious paving.		✔					✔			
Replace asphalt paving in the South Lot with a pervious paving system that reduces the amount of stormwater runoff and permit greater water infiltration.*		✔				✔	✔			✔

* Because this strategy requires feasibility studies and funding acquisition which are undetermined at this time, this strategy is not shown on the development program project list within the timeline of this master plan.

FIGURE 4-14 FUTURE STORMWATER MANAGEMENT STRATEGIES PLAN



Installation Boundary

Raingarden/Bioretention Opportunity Area

Green Roof Integration Opportunity Area

Underground Retention/Pervious Pavement Opportunity Area

N

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Feet

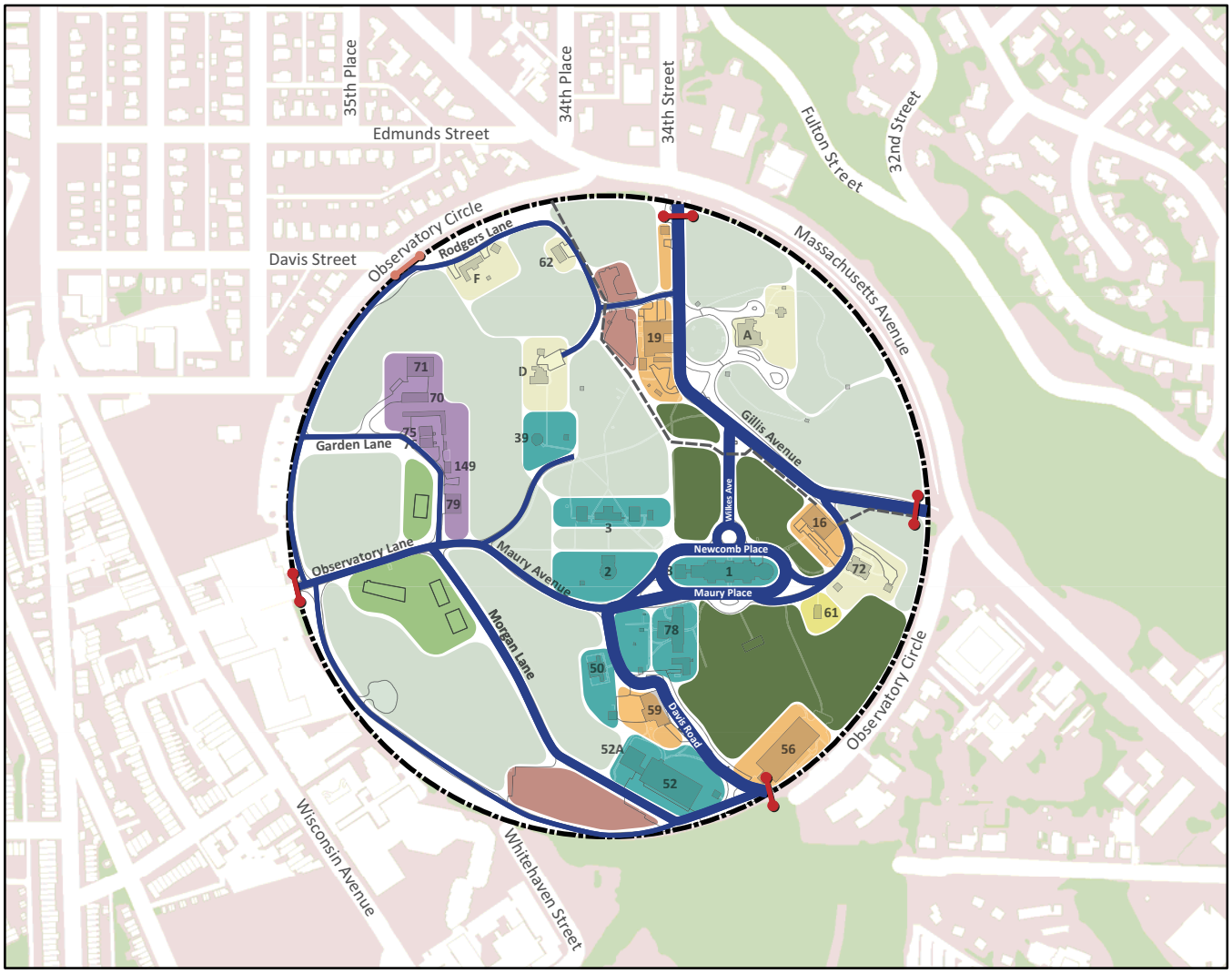
Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

4.3 Framework Plan

The framework plan (Figure 4-15) for NSF Naval Observatory recommends broad planning initiatives that represent types and locations for development without being tied to specific projects. The general nature of this plan provides the flexibility to accommodate an uncertain future, yet provides enough guidance that it will not become quickly outdated. The framework plan:

- Accommodates growth to 2017 in existing facilities, although the population is expected to remain stable.
- Can absorb unanticipated growth into existing facilities through adaptive reuse of the facility in question.
- Maintains the lower density development characteristic of the Installation.
- Maintains the arrangement of existing facilities and streets; thereby, preserving the campus setting and pedestrian walkability.
- Promotes multimodal connections to regional mass transit, bicycle routes, and pedestrian walkways/trails.
- Preserves existing open space, ceremonial areas, and forests to support USNO's astronomical missions.
- Reserves parcels for development that may occur in the future, beyond the scope of this master plan.
- Although not under the purview of this master plan, the framework plan does show areas for additional administrative space necessary for the USSS to complete their mission.

FIGURE 4-15 FUTURE FRAMEWORK PLAN



- Installation Boundary
- Base Support Parcels
- Family/Bachelor Housing Parcels
- Open Space/Preservation Parcels
- Parking Parcels
- RDT&E Parcels
- Recreation Parcels
- Storage Parcels
- Temporary Lodging Parcels
- Ceremonial Green Space
- Roads
- Operational Gates
- Closed Gate
- Residence of the Vice President of the United States Fence

N

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Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

4.4 Future Land Use Plan

The land uses from the RIMP 2.0 Model Base (Figure 2-1) are transposed into the UFC 2-000-05N land use categories and shown in Figure 4-16. This conversion allows an easy comparison with the existing land use map described in Chapter 3.

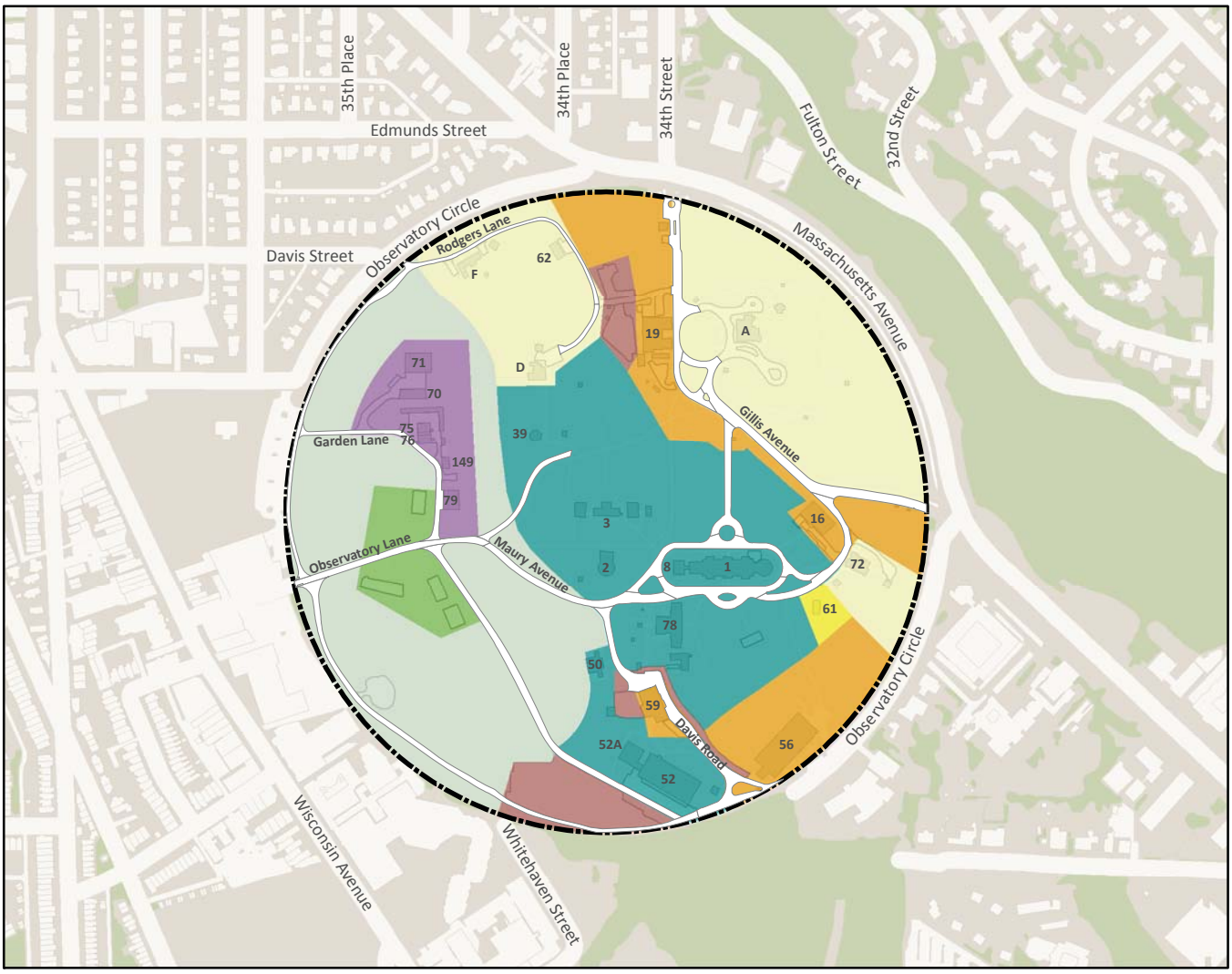
Within the five-year time frame of the NSF Naval Observatory Master Plan, no changes to the land uses are planned, and all land uses will remain the same in terms of delineation and area. Table 4-10 compares the existing and future land use acreages.

TABLE 4-10 COMPARISON OF EXISTING AND FUTURE LAND USES

	Existing		Future	
Land Use	Total Acreage	% of Total	Total Acreage	% of Total
Base Support	9.25	14	9.25	14
Family/Bachelor Housing	16.83	23	16.83	23
Open Space/ Preservation	17.97	25	17.97	25
Parking	3.19	4	3.19	4
RDT&E	18.88	26	18.88	26
Recreation	2.42	3	2.42	3
Storage	3.18	4	3.18	4
Temporary Lodging	.38	1	.38	1
Total	72.10	100	72.10	100

Source: NAVFAC Washington in conjunction with EMA, 2008; Washington, D.C., GIS, 2008; ESRI StreetMap USA, 2005; iNFADS, 2009; FRES, 2009.

FIGURE 4-16 FUTURE LAND USE PLAN



- Installation Boundary
- Base Support
- Family/Bachelor Housing
- Open Space/Preservation
- Parking
- RDT&E
- Recreation
- Storage
- Temporary Lodging

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

4.5 Long-Term Framework and Land Use Plan

Although this NSF Naval Observatory Master Plan strategies and framework plans extends only five years into the future, there are several planning issues to consider for the installation in the long term, up to 20 years out. These issues include internal improvements to infrastructure, environmental sustainability, and encroachment.

Long-Term Framework

The issues and planning strategies presented here will not necessarily be happening within the scope of this NSF Naval Observatory Master Plan. Nevertheless, these important issues are at the forefront of planning, and they are summarily briefed here to acknowledge these trends and offer suggestions for further study and consideration. The summary of long-term strategies listed below are keyed to the plan shown in Figure 4-18.

1. Renovate existing facilities that can still serve as viable facilities for similar or new uses (Buildings 3 and 78).
2. Backfill buildings that have vacant space that can be repurposed for similar or new uses (Building 56).
3. Consider demolishing Building 59 and relocating the support functions. The demolition/relocation can allow for the realignment of Davis Road for better traffic circulation. Police/Security function could move to the eastern portion of South Lot. Food service could move to the east side of a realigned Davis Road.
4. The new site for RDT&E is adjacent to other similar facilities and maintains a compact clustered arrangement of buildings.
5. Although not in the purview of this master plan, the USSS facilities could consolidate surface parking to the north of Building 19. This would provide land immediately adjacent to the Building 19 that would allow future structures to maintain a compact cluster.

Long-Term Land Use Plan

Within the long-term (approximately 20 years) time frame of the NSF Naval Observatory Master Plan, a few minor changes to land uses are planned. These include an including expansion of base support to accommodate future building sites and a decrease of parking acreage due to efficiencies from consolidating surface lots (see Table 4-11 and Figure 4-17).

TABLE 4-11 COMPARISON OF FUTURE AND LONG-TERM LAND USES

Land Use	Future		Long-Term	
	Total Acreage	% of Total	Total Acreage	% of Total
Base Support	9.25	14	10.47	15
Family/Bachelor Housing	16.83	23	16.83	23
Open Space/ Preservation	17.97	25	17.97	25
Parking	3.19	4	2.06	3
RDT&E	18.88	26	18.79	26
Recreation	2.42	3	2.42	3
Storage	3.18	4	3.18	4
Temporary Lodging	.38	1	.38	1
Total	72.10	100	72.10	100

Source: NAVFAC Washington in conjunction with EMA, 2008; Washington, D.C., GIS, 2008; ESRI StreetMap USA, 2005; iNFADS, 2009; FRES, 2009.

FIGURE 4-17 LONG-TERM LAND USE PLAN

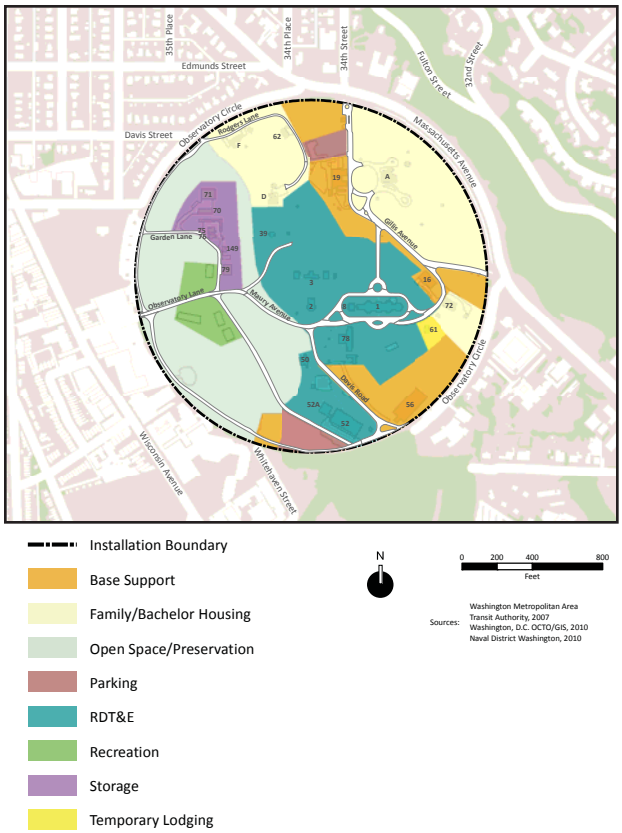
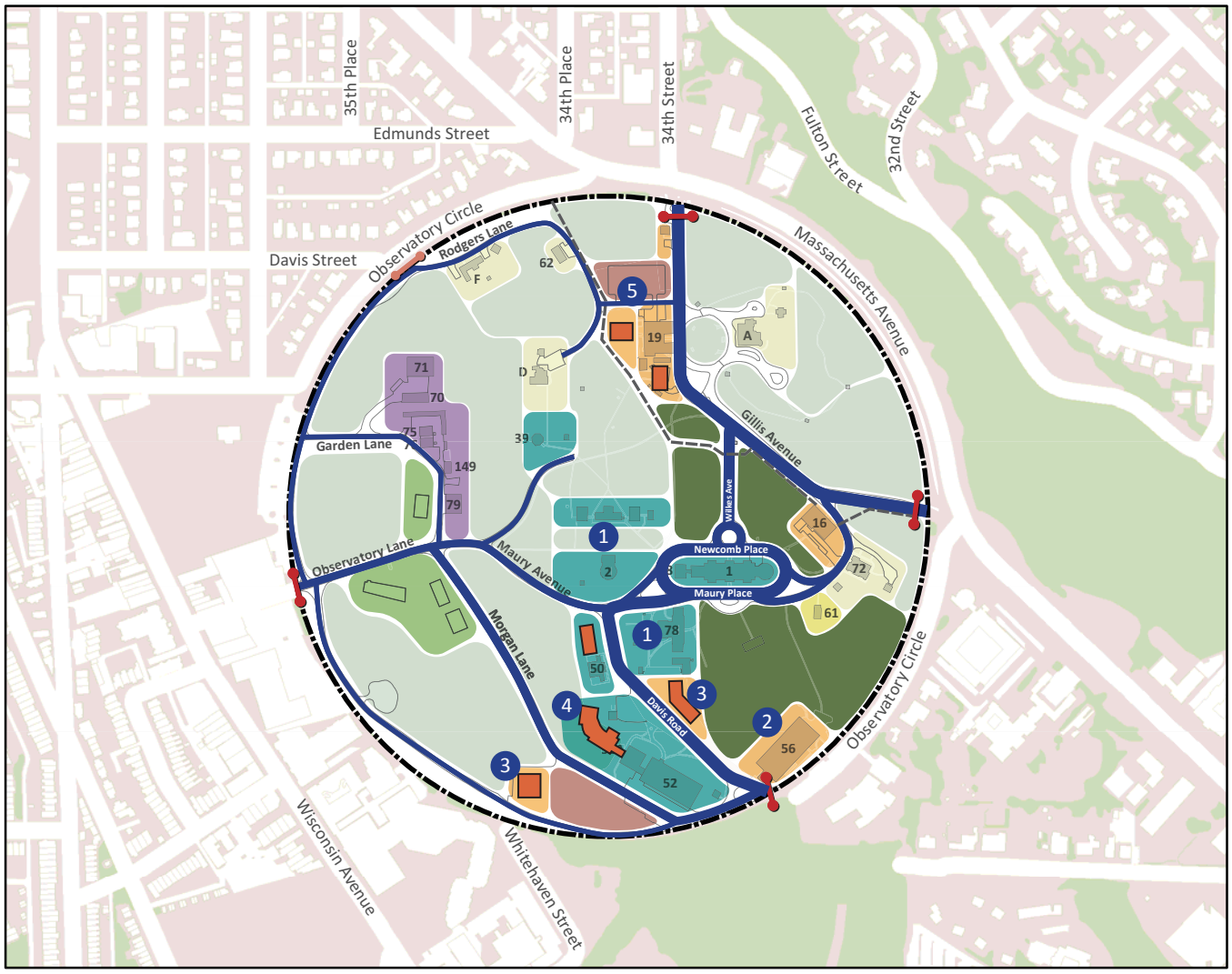


FIGURE 4-18 LONG-TERM FRAMEWORK PLAN



- Installation Boundary
- Base Support Parcels
- Family/Bachelor Housing Parcels
- Open Space/Preservation Parcels
- Parking Parcels
- RDT&E Parcels
- Recreation Parcels
- Storage Parcels
- Temporary Lodging Parcels
- Ceremonial Green Space
- Roads
- Operational Gates
- Closed Gate
- Residence of the Vice President of the United States Fence
- Long-term Builidng Sites

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Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

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5.0 Development Program

This chapter summarizes NSF Naval Observatory's master plan known program. Tenant input on the program was collected through the interview and charrette workshop process to determine future personnel and project needs. The envisioned program for the NSF Naval Observatory Master Plan extends over the next 5 years. A long-term outlook for parking is also provided to ensure that Navy is coordinating with NCPC guidance for parking ratios.

5.1 Population

Population growth at NSF Naval Observatory will not be increasing for the near-term outlook of this master plan. This steady state was confirmed by feedback from interviews and charrette workshops with stakeholders, as well as data from personnel projections, installation reports and various other studies. The constraints of available Navy funding for new construction and personnel projections means little is happening in terms of near-term change.

- **NSF Naval Observatory:** the total population of 314 will not increase over the near-term span of the NSF Naval Observatory Master Plan.

Content intentionally omitted

5.2 Parking

The National Capital Planning Commission (NCPC) enforces a comprehensive plan that provides parking guidelines and goals for federal agencies in the National Capital Region including the NSF Naval Observatory. The comprehensive plan calls for this installation to achieve a ratio of parking to employees of 1:4. This means one parking space for every four employees, of which the installation currently does not achieve this guidance.

It is not possible to achieve the desired NCPC parking ratio within the near-term timeframe of the installation master plan due to unforeseen/unchanging mission requirements and funding restrictions. Therefore, the master plan will maintain the same number of employee parking spaces over the next five years.

TABLE 5-1 NSF NAVAL OBSERVATORY PROGRAMMED POPULATION AND PARKING

Year	Employee Pop.	Employee Parking	Parking Ratio	SOV mode split (%)
Existing	314	313	1 : 1.00	83.6*
Near-term (5 yrs)	314	313	1 : 1.00	76.0**
Long-term	-	-	1 : 3.00	-
Long-term (SOV-only Mode Split)	-	-	1 : 3.00	~ 33.3

General Note: NCPC's preferred parking ratio for NSF Naval Observatory is 1:4.00.
*Existing mode split adds in bicycle trips as these were not collected in the gate count data. See Transportation Management Program for more details.
**This near-term parking ratio goal uses ONLY SOV employee parking in the calculation.

Content intentionally omitted

The most recent revision to Federal TMP guidelines provided by NCPC was developed to reflect the relationship between the location of federal workplaces relative to the Metrorail system. The parking ratios were also developed with consideration of the overall quality of available transit services and walking distances and conditions in the region.

NSF Naval Observatory is situated within the Historic District of Columbia Boundaries where the parking-to-employee ratio goal set by NCPC is one parking space for every four employees (1:4). However, the relationship of NSF Naval Observatory to existing transit services (particularly Metro) and the character of the surrounding area are not consistent with the conditions described for this parking ratio in the Transportation element of the Comprehensive Plan. Additionally, the current method that NCPC uses to calculate parking ratios, including both carpool and vanpool spaces within the employee parking ratio, disincentivizes these more environmentally friendly modes of transportation.

Although unable to meet the parking ratio goal for the near term, the NSF Naval Observatory is committed to reducing SOV commuting trips over the long-term in a reasonable way. NDW proposes to implement over the long-term a parking ratio goal of 1:3 ("suburban areas within 2,000 feet of Metrorail") as previously recommended by NCPC staff in November 2013 and as supported by the following text. NDW also recommends that NCPC revise the parking ratio definition and calculation method as explained below.

Long-term Parking Ratio Goal of 1:3

NSF Naval Observatory is relatively well served by transit but is not within 2,000 feet of Metrorail (about a quarter to half mile); it is instead approximately 1.4 miles from the nearest Metrorail station as noted in Section 2.1. This additional distance means that if employees do not opt to walk the 30 minutes from the Metrorail station or take Capital Bikeshare for the link, most Metrorail trips require an additional transfer to another mode of transportation making most commutes by Metrorail at least a "two-seat" commute (two modes of transportation), and likely "three-seat" commute for those who drive to Metro. Every additional mode transfer can add approximately 10 minutes (transfer and waiting time), making the multimode commute more burdensome.

Additionally, as noted in Section 2.0, in terms of public transportation, direct access to NSF Naval Observatory is only available via local bus routes provided by the D.C. Circulator and Metrobuses. The D.C. Circulator and Metrobus lines that re directly or within walking distance of NSF Naval Observatory reach only as far as the Friendship Heights Metrorail station in Montgomery County and the Southern Avenue Metrorail station in Prince George's County. Therefore, for the 93 percent of employees who live outside of Washington, D.C., unless the employee lives in either Chevy Chase, MD or Hillcrest Heights, MD, at least one bus transfer is needed to commute to NSF Naval Observatory; this means that no more

than 7 percent of employees have a "one seat" bus commute (one transit leg) to NSF Naval Observatory. Transit usage declines when there is additional commuting time and for "two-seat" or more commutes, a trend well documented in literature due to the added commute time incurred. The lack of regional bus service with minimal transfers further supports the definition of the NSF Naval Observatory neighborhood as a "suburban area within 2,000 feet of Metrorail," or an installation that is not well served by transit outside of the local jurisdiction it resides in.

SOV use could decrease and transit mode usage could increase within the 5-year near-term timeframe with additional transit services, HOV facilities, and better transit connections in the surrounding area, however these improvements are largely outside of the control of NSF Naval Observatory. Currently, there is no DoD shuttle bus service to other installations due to funding and demand as well as no service to mass transit stations due to current regulations and laws. If possible, a reliable DoD shuttle bus service could be one of the most effective ways to increase transit ridership for the "last mile" from nearby transit hubs.

In addition to the extra travel time barriers that most employees face to take transit to NSF Naval Observatory, the installation is also not able to benefit from carpooling and vanpooling as it is not near any HOV lanes.

The nature of the work at NSF Naval Observatory is also such that scientists work throughout the night and have non-traditional commuting hours and limited telecommuting options. Therefore it is also important to note that in the Transportation element of the NCPC Comprehensive Plan, the original parking ratio policies were designed around federal agencies with office functions and that special consideration should be given to federal facilities with nonoffice functions such as those at NSF Naval Observatory.

Given the existing transit alternatives and lack of HOV facilities within the NSF Naval Observatory neighborhood, as well as the non-office work performed, NSF Naval Observatory proposes a revised 1:3 parking ratio goal be allowed until additional surrounding transit improvements are implemented that allow a total installation-wide employee "one-stop" transit commute access rate of greater than 33 percent.

Other Parking Compliance Recommendations (parking ratio requirement in an SOV-only mode split format)

The current NCPC process for calculating parking ratios includes all employee spaces used by single occupant vehicles, carpools, and vanpools, as well as handicap spaces, and is intended to limit the number of people who drive to work. However, those employees who carpool or vanpool are already making a conscious decision to commute more sustainably and as NCPC parking ratios are currently enforced, the limited supply of parking acts as a disincentive to those carpooling/vanpooling since they are treated equally as SOVs in the parking ratio calculation. By eliminating employee carpool and vanpool spaces from the constraint of the NCPC defined parking ratio, the installation can more effectively encourage employees to commute by carpool/vanpool.

Revising the parking ratio requirement as a mode split goal allows different occupancy levels of vehicles, as well as any other commuter transportation choice, to be evaluated independently and more accurately. When evaluating an installation's compliance to the TMP objectives and goals by including an evaluation of mode split, the findings are more accurate and transparent since the percentage of employees using alternate forms of transportation is evaluated by mode split, not inferred by a lower parking ratio.

NDW proposes to NCPC that compliance with the overall sustainable objectives of the TMP (reduce traffic, encourage non-SOV travel, etc.) be evaluated with an SOV-only mode split goal, instead of the traditional parking ratio goal system that penalizes carpooling and vanpooling. Therefore, an employee SOV-only mode split goal of 33.3 percent (1:3 parking ratio ONLY considering employee SOV spaces) works to meet NCPC's objective of limiting the amount of parking on installations without disincentivizing the more sustainable commuting modes of carpooling and vanpooling. Table 5-1 shows what this revised parking ratio definition would look like at NSF Naval Observatory (Long-term - SOV-Only Mode Split).

5.3 Program Projects

One project is planned for the NSF Naval Observatory Master Plan over the next five years. The USSS needs additional administrative office space and is planning to expand Building 16 by FY 2017 (Table 5-2 and Figure 5-1). Although this is project is on the Residence of the Vice President's portion of the installation and not within the purview of this master plan, it is being included here for informational purposes.

TABLE 5-2 PROGRAM PROJECT

Program	Project Area	Location	Renovated (sf)	Added (sf)	
Addition	1	Building 16	10,535	5,000	*Content intentionally omitted*

Source: 1391s and NAVFAC Washington, 2012.

Project Description

This project upgrades Building 16, which is currently used for USSS administrative offices. The building previously housed the Installation's boiler and utility plant. Originally constructed in 1890, the facility is in need of upgrades and additional space to meet USSS mission requirements.

An operations and maintenance project (RM 09-1863) is scheduled to modernize the facility by upgrading the HVAC systems, flooring, light fixtures, and fire suppression systems.

This proposed project adds 5,000 square feet above the old boiler room floor. The project will add a second and third floor addition to extend the facility to its current first floor foundation. This addition will solve the USSS's space shortage for administrative staff. Because the project is an addition, it will not increase the impervious surfaces on the Installation, thereby not increasing stormwater runoff.

Because this is a NRHP-eligible historic structure, the Section 106 consultation process will be necessary. For additional details on this process, see the NDW ICRMP.

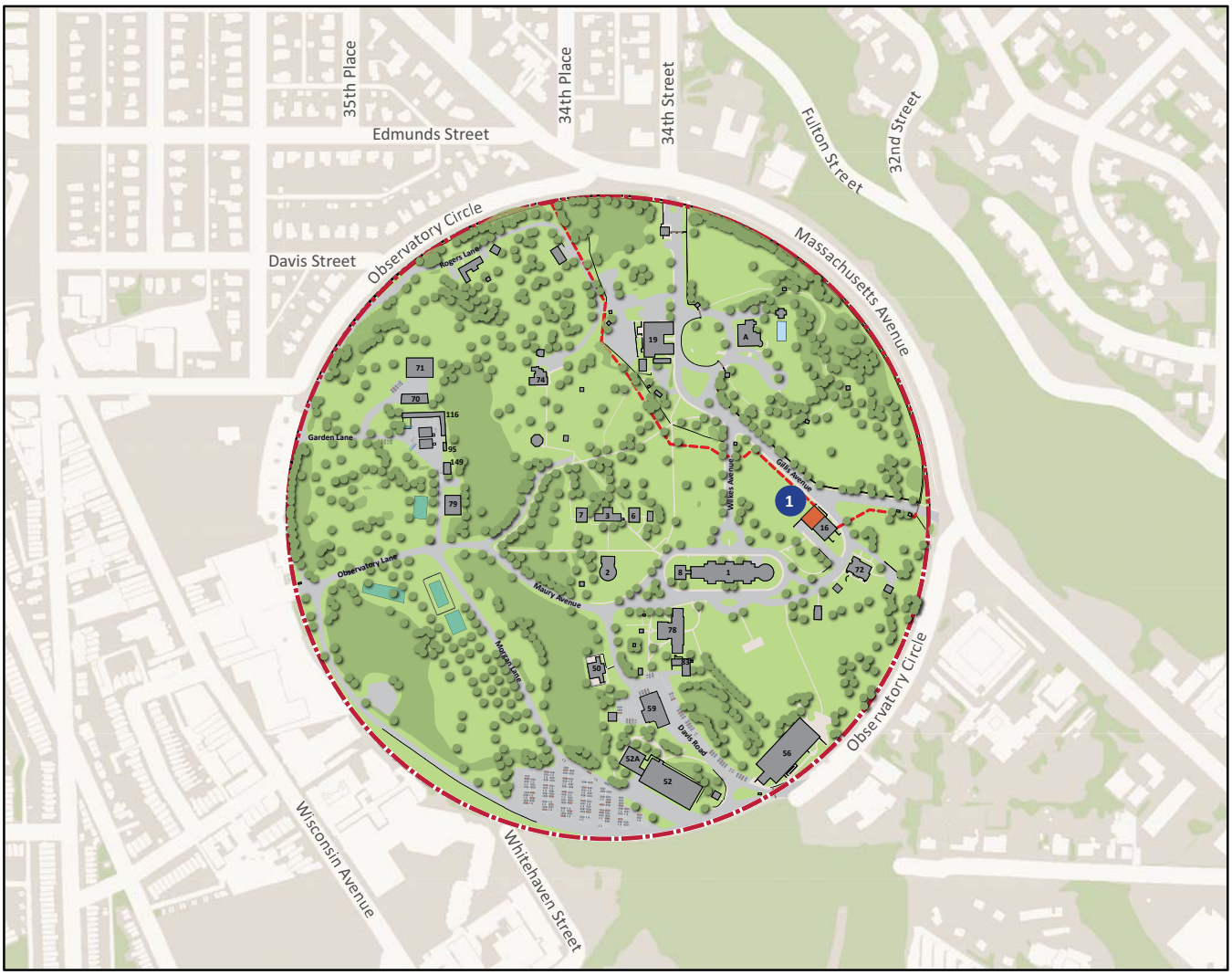
5.4 Program Phasing

Because the Building 16 addition is the only project programmed within the five-year master plan time frame, phasing is not essential. The project can commence once funds have been secured and design and construction documents have been completed for the addition. Table 5-3 shows the project time line as fiscal years 2016-2017.

TABLE 5-3 PROGRAM PHASING PLAN

Map ID	Project Information	FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Building 16																					
1	Project #: -																				
	Construct Addition: 5,000 SF																				
	Content intentionally omitted																				

FIGURE 5-1 PROGRAM PROJECTS PLAN



- Installation Boundary
- Water
- Road
- Parking
- Existing Sidewalk
- Fence
- Athletic Court
- Green Area
- Trees
- Existing Building
- Renovation Project
- Residence of the Vice President of the United States Fence

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Feet

Sources:
Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010

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6.0 Appendices

6.1 Installation Appearance Plan

The Installation Appearance Plan (IAP) provides direction for designing and developing the NSF Naval Observatory improvement project. Focus is placed on four appearance issues: landscape architecture, entry gate design, signage, and paint color schemes. The existing conditions of the focus areas were evaluated on the basis of their impacts to the overall visual environment. The section below describes and prioritizes the focus areas identified according to their need for improvement. Additionally, IAP special projects represent more specific steps needed to improve the Installation appearance.

Landscape Architecture

For an Installation with a strong architectural presence, landscape improvements provide an ideal means for applying greater aesthetic value. Although they shall not be addressed at NSF Naval Observatory prior to higher priority appearance items, landscape recommendations to improve the visual appearance include:

- Implement amenities such as street trees, site furniture, and pedestrian lighting. Consistency among landscape elements such as site furniture and street trees is intended to communicate a hierarchy of buildings and roadways, add visual interest, and help direct pedestrian and vehicular movement.
- Screen utilities, parking, and other unattractive activities to visually block obtrusive views.
- Landscape high visibility areas with formal plantings. A consistent plant and pavement palette will help distinguish facilities and establish a unified character.

Building 1 has aesthetically pleasing landscaping.
Source: U.S. Naval Observatory IAP, 2008.

- Use landscape plants that are native, non-invasive, low-maintenance, drought-tolerant, and disease-resistant per the Integrated Natural Resource Management Plan.
- Implement plant material to enhance pedestrian safety, frame views, emphasize building entrances, identify significant buildings, provide visual interest throughout the year, define outdoor spaces and courtyards, and provide a coherent identify.
- Landscape personnel support and housing areas with clear and defined landscaping.
- Incorporate landscapes that protect the environment, reduce life cycle costs, improve living conditions, and contribute to the overall health of the environment.

Building 56 depicts the natural brick color and green roof color scheme used in other facilities on the Installation.
Source: U.S. Naval Observatory IAP, 2008.

Entry Gate Design

Because they establish the initial impression of an Installation and reflect the overall quality of NSF Naval Observatory, entry gate improvements are a high priority. Recently the South Gate, North Gate, and Massachusetts Avenue Gates were upgraded with Installation signage and Navy branding. If the Wisconsin Avenue Gate were to become operational in the future, the same treatments and Navy branding shall be applied to improve the aesthetics and convey an appropriate image of the Installation.

Signage

An attractive and well-developed signage system is currently in place at the NSF Naval Observatory. Most signage is appropriately scaled to accommodate pedestrian traffic. Existing signage includes building identification, directional signs, and regulatory signs. However, the NSF Naval Observatory Master Plan also recommends additional directional signs for multimodal transit when it is implemented. This planning strategy encourages the use of public transportation.

Paint Color Schemes

Building paint color schemes are not an immediate priority based upon the Installation's existing historic buildings. The majority of these buildings are unpainted and display natural materials such as brick or stone. The recommended paint color palette accounts for the existing color schemes and reflects the standard palette of Pantone colors set by the Navy's Installation Appearance Guide. The scheme is intended to promote a unified visual environment throughout the Installation and the region, and it shall be adhered to on all future renovation and new construction projects including the Building 16 addition described in Chapter 6. For specific color schemes, see Chapter 5 of the IAP.

Installation Appearance Plan Special Projects

The special projects are considered the most necessary improvements and will be implemented prior to other appearance projects on the Installation; these projects include:

- **Coordination of Site Furnishings.** The NSF Naval Observatory is generally well outfitted with site furnishings (benches, picnic tables, and trash receptacles); however, these amenities are in varying states of disrepair and are not consistent in style. It is recommended that deteriorating site furnishings be replaced with amenities that are appropriate to the architectural style of the surrounding buildings. If areas of high visibility do not have the aforementioned amenities, site furnishings shall be provided.
- **Landscape Improvements at Building 16.** The north/northwest sides of Building 16 face the grounds of the Residence of the Vice President of the United States and Massachusetts Avenue. Recent projects have created visual clutter in and around this building. A vegetated buffer consisting of trees and shrubs shall be provided to the north and northwest of this building to soften and screen specific views. The selected plant material shall be consistent with the surrounding area, shall not be visually distracting, and must be AT/FP-compliant.
- **General Landscape Improvements and Screening of Utilities.** Numerous locations have exposed mechanical equipment, which detracts from the surrounding landscape. If located adjacent to public walkways, these areas shall be screened with evergreen plant material that will effectively block views. The selected plant material shall be consistent with the surrounding area and shall not be visually distracting.
- **Replacement of Metal Guardrails with Wooden Guardrails.** The metal guardrails along roads are out of character for the Installation and shall be replaced with wooden ones that are the same as or similar to those found near Building 54, helping to unify the Installation by maintaining the consistent character of site elements.

The NSF Naval Observatory Master Plan supports the implementation of these projects to enhance the overall visibility of the Installation and create a unified appearance. For additional details on these projects, see the IAP.

6.2 Historic Preservation Analysis

This section provides guidance on the effects the proposed project included in this NSF Naval Observatory Master Plan will have on the identified historic properties and the status of compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

Section 106 Policy

Section 106 of the NHPA of 1966, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties that are eligible for listing in the NRHP. Historic properties may include archaeological sites, individual buildings, historic districts, landscapes, structures, objects, and traditional cultural properties. Historic properties at NSF Naval Observatory include the National Register-eligible Naval Observatory Historic District and 17 buildings.

The term "undertaking" refers to any action that can have an effect on or change a historic property. Potential undertakings include, but are not limited to:

- Ground-disturbing activities
- Maintenance, repair, or adaptive reuse of a building
- New construction within a historic district, adjacent to a historic district, or within visual range of a historic building or district
- The demolition of a historic building
- The demolition of a non-historic building in a historic building/district viewshed
- Landscaping (including tree removal, planting, or other landscape actions).

In accordance with established procedures at each installation, an action proponent files a NEPA Compliance Checklist plus a copy of the Work Request or Project Description with the NSA Washington CRM. At NSF Naval Observatory, the NSA CRM is the designated point of contact for all Section 106 consultation. Currently, the NSA CRM is assigned to the NSA PWD. The NSA CRM then reviews the project description and determines whether the project has the potential to affect historic properties or whether it is exempt from Section 106 compliance. The NSA CRM will then either record that the undertaking is exempt, or engage in consultation for Section 106 compliance as required by 36 CFR 800. If the undertaking involves changes, the NSA CRM initiates compliance with Section 106 through notification to the District Department of Historic Resources (DC SHPO) and interested parties. In evaluating the need for Section 106 consultation, the CRM must consider the character of the proposed changes to historic properties, along with consideration of whether the undertaking or project is governed by a Programmatic Agreement or a federal agency program alternative established under 36 CFR 800.14.

As identified in Chapters 3 and 4 of this NSF Naval Observatory Master Plan, Building 16 (USSS Administrative Building) is a historic property that has been identified as contributing to the NRHP and will be impacted by the NSF Naval Observatory Master Plan program. The addition to the facility shall follow procedures stated in the NDW Integrated Cultural Resource Management Plan (ICRMP) and comply with Section 106 of the NHPA as amended. This compliance will ensure that future development within the five year time frame of this master plan supports NSF Naval Observatory's vision of honoring its past and preserving historic buildings as a testament to the Installation's heritage.

Section 106 Procedures

All Section 106 consultation required for historic properties at NSF Naval Observatory will be initiated and conducted by the NSA CRM. Section 106 consultation must be completed prior to undertaking the action. Initiating the Section 106 process in a project's early planning stages allows the fullest range of options to avoid, minimize, or mitigate any adverse effects on historic properties.

Consultation with DC SHPO may begin in the project design phase as soon as sufficient data on the scale, massing, materials, proportions, and treatment of historic materials is available. The agency will be most concerned about exterior design issues and treatments of important interior spaces. Data required to facilitate DC SHPO review may include written documentation describing the project, photographs, and exterior and interior drawings showing details of character-defining features, site plans and orientation, and treatments of historic materials.

The sections below summarize the principal steps involved in the Section 106 compliance process for undertakings that potentially will cause effects on historic properties.

1. Initiate Section 106 Process

- **Establish the undertaking** that will be performed by the NSA CRM to determine whether the proposed action or activity meets the definition of an "undertaking." If so, determine whether it is deemed to have "no potential to cause effects" or the "potential to cause effects."
- **Coordinate with other reviews** performed by the NSA CRM in conjunction with Installation planning schedules and other required reviews.
- **Initiate consultation with DC SHPO** and request their participation in the process.
- **Plan for public involvement** to occur during the Section 106 process and request public participation.
- **Identify other consulting parties** entitled to provide oversight and determine which entities shall be consulting parties.

2. Identify Historic Properties (36 CFR 800.4)

- **Determine the scope of identification efforts and identify historic properties** in consultation with the DC SHPO to determine whether historic properties are located within the proposed area(s) of effect.

3. Assess Adverse Effects (36 CFR 800.5)

- **Apply criteria of adverse effect** in consultation with the DC SHPO to assess the adverse effects outlined in 36 CFR 800.5.

4. Resolve Adverse Effects (36 CFR 800.6)

- **Continue consultation** with the DC SHPO and consulting parties to develop and evaluate alternatives or modifications to the undertaking that can avoid, minimize, or mitigate adverse effects on historic properties.
- **Execute a Memorandum of Agreement** between NSF Naval Observatory, the NSA CRM, the DC SHPO, and consulting parties how adverse effects will be resolved.
- **Failure to resolve adverse effects - termination of consultation** occurs if the NSA CRM, DC SHPO, or the Advisory Council on Historic Preservation determines that further consultation will not be productive and henceforth terminates consultation by notifying all consulting parties in writing and specifying reasons for termination.
- **Provide Advisory Council on Historic Preservation** 45 days after receipt of request to allow an opportunity for NSF Naval Observatory, consulting parties, and the general public to provide their views.

5. Proceed

Once a signed Memorandum of Agreement or Council comment has been received, NSF Naval Observatory can, subject to the terms of any agreement that has been reached, proceed. This action completes the Section 106 compliance process.

For additional details on the Section 106 process and procedures refer to the NDW ICRMP, Chapter 10.

6.3 Historic Preservation Compliance

This section explains how the NSF Naval Observatory Master Plan complies with the Secretary of the Interior's standards for treatment of historic properties, the Navy's categorization standards and what sections will require additional consultation with interested parties.

Treatment of Historic Districts, Buildings, and Structures

The Department of the Navy's 1997 Historic and Archaeological Resources Protection Planning Guidelines formally introduced Categorization of the Built Environment (CBE) as a tool for treatment of buildings and structures, specifically those listed in or eligible for listing in the NRHP. The concept behind CBE is that although all such "historic properties" by definition possess "significance," all such properties cannot be treated or managed in the same manner or to the same degree. CBE considers both a property's relative significance (as compared with other historic properties) and its contemporary value to the Navy (a realistic consideration of what can be done with the property today or in the future). Although the 1997 HARP guidelines are considered to be superseded, the Navy continues to use the treatment categorization system that was first established in these guidelines.

In CBE each building or structure is assigned to a category carrying with it a set of protocols for how the property is to be treated. On a scale of I to IV, with I being highest, elements of the built environment in Category I possess the greatest significance and/or contemporary value to the Navy and are therefore to be protected and conserved to the greatest extent possible. Elements of the built environment assigned to Category IV, on the other hand, possess little or no significance or contemporary value and need not be protected or preserved.

It was originally intended that the CBE categories and their associated treatment recommendations would serve as the basis of a nationwide Programmatic Agreement among the Navy, the National Conference of State Historic Preservation Officers, and the ACHP. The recommended treatment, described below, while never formally ratified in a Programmatic Agreement, may serve as general guidance for cultural resource management decisions.

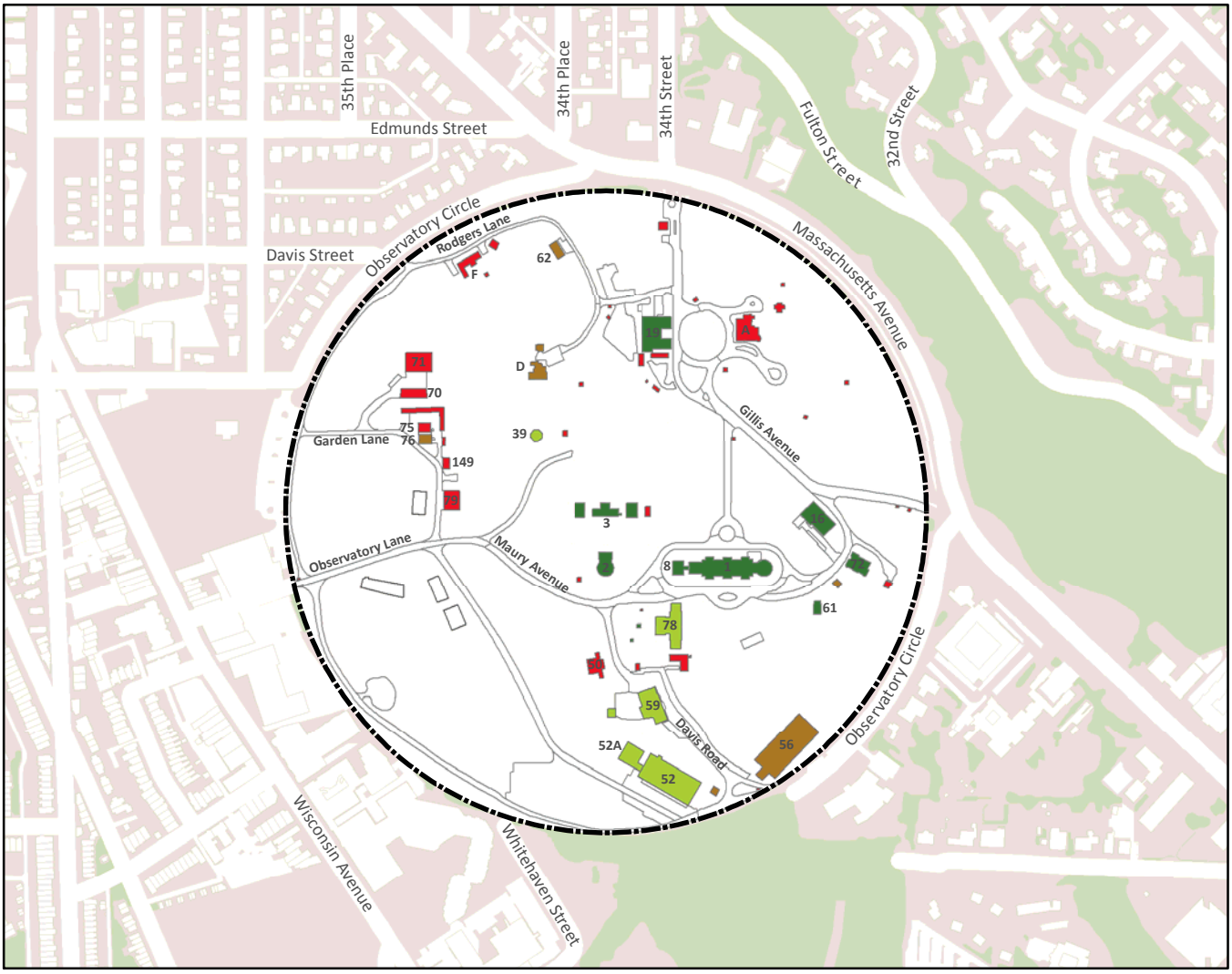
Four preservation categories and treatment protocols were developed:

- **Category I - Long-Term Preservation.** These historic properties are of great architectural and historical importance that contribute significantly to the national cultural heritage. These properties possess architectural and historical integrity of a high degree, and their protection represents the highest priority. Treatment protocols include:
  - Maintain and repair in accordance with the recommended procedures in the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (Weeks and Grimmer 1995, hereinafter Secretary's Standards).
  - Give priority to the continued and adaptive use of the property in carrying out the installation's or activity's mission and assisting tenant activities in carrying out their missions.
  - Consider demolition only as a last option, and validate with independent analysis.
- **Category II - Consideration for Long-Term Preservation.** These properties contribute to the significance of NSF Naval Observatory. They also exhibit continuing or adaptive use potential, or display other values to merit consideration in the planning and decision making process. Treatment protocols are as follows:
  - Maintain and repair in accordance with the recommended procedures in the Secretary's Standards.
  - Actively encourage the continuing use and adaptive use of the property in carrying out the installation's or activity's mission, and in assisting tenant activities in carrying out their missions.
  - Ensure that the property is documented (usually in accordance with HABS/HAER of equivalent standards before it is demolished, substantially altered, or allowed to deteriorate substantially.
- **Category III - Consideration in Planning and Decision Making.** This category includes aspects of the built environment that possess sufficient significance, continuing or adaptive use potential, or other value to merit consideration in planning and decision making. These were not assignable to Category II because they have severely compromised integrity or unsympathetic adaptations, or comprise minor aspects of the built environment. Treatment protocols include:
  - Maintain and repair in accordance with the recommended procedures in the Secretary's Standards, but do not undertake heroic efforts to preserve or repair.
  - Ensure that the property is documented (usually in accordance with HABS/HAER of equivalent standards before it is demolished, substantially altered, or allowed to deteriorate substantially.
- **Category IV - Other Properties.** These are properties are buildings and other structures that have no significance and are not considered eligible for the NRHP. Project proponents may act at will toward these buildings and structures without consultation except where noted in the Treatment Options. Properties assigned to Category IV need not be maintained for historic preservation purposes, nor documented prior to their destruction or alteration. Note that this does not mean that an installation or activity can do whatever it wishes with a Category IV property. For example, if replacing or adding to such a property could introduce visual elements into a historic district or the setting of an individual NRHP-eligible property, or if work on the Category IV property would will disturb NRHP-eligible archaeological resources, Section 106 consultation would be required.

Implications

Most NSF Naval Observatory facilities are categorized as either Category I, II, or IV. As shown in Figure 6-1, Building 16 is a Category I facility. Any undertakings such as facility additions follow Category I treatment protocols to meet the Secretary of the Interior's Standards for the Treatment of Historic Properties.

FIGURE 6-1 CATEGORIZATION OF THE BUILT ENVIRONMENT



Installation Boundary
Category I
Category II
Category IV
Not Surveyed

N

0 200 400 800
Feet

Sources: Washington Metropolitan Area Transit Authority, 2007
Washington, D.C. OCTO/GIS, 2010
Naval District Washington, 2010