4. EXISTING CONDITIONS - NNMC BETHESDA CAMPUS

This chapter is a discussion of existing constraints and opportunities and built and natural environmental features of the campus that affect future uses to include climate, land uses, utilities, historical and archaeological elements, and physical characteristics and limitations of the campus.

4.1 Site Overview

The National Naval Medical Center (NNMC) is located at 8901 Wisconsin Avenue (Maryland 355 or Rockville Pike), Bethesda, MD. (Figure 4-1 Aerial Photograph) The campus is approximately 245 acres and is located just northeast of the Bethesda Central Business District. The campus is bound on the west by Rockville Pike, to the northeast by I-495, and to the south by Jones Bridge Road. The land uses in the immediate area are the National Institutes of Health main campus to the west, Stoney Ridge School of the Sacred Heart and residential housing to the north, Rock Creek Park and North Chevy Chase Park to the east and Columbia Country Club and residential housing to the south.

The campus has an overall pleasant appearance on rolling to hilly topography. There are significant areas of mature trees that provide a buffer for some adjoining land uses. A forested area in the center of the campus around Stoney Creek and its 100-year flood plain bisects the campus from southwest to northeast. The topography created by the eroding action of the stream creates variations in land form with some steep slopes. While creating a pleasant natural environment, it is also a large area of construction constraints.

4.2 Features

4.2.1 Topography

The topography of the campus in general is gently sloping to moderately steep terrain. (Figure 4-2 Existing Topography) Total change in elevation is from a high of approximately 330 feet above sea level in the southwestern corner of the campus to a low of approximately 210 in the northeastern area of the campus adjacent to I-495. In the western central portion of the campus, the area occupied by the main medical complex is flat to gently sloping. From here the topographic relief breaks to west towards Rockville Pike and to the east towards Stoney Creek. Another area of relatively moderate slopes is along Taylor Road and the Flag Officer's quarters. Along Stoney Creek, the topographic relief on both sides of the creek is steep to very steep. A major portion of the campus drains to Stoney Creek that flows from the southwest to the northeast and passes though the approximate center of campus. The area between Rockville Pike and the western face of building No. 1 flows to northwest. A small area to the north of the Flag Officer's housing drains to the north.

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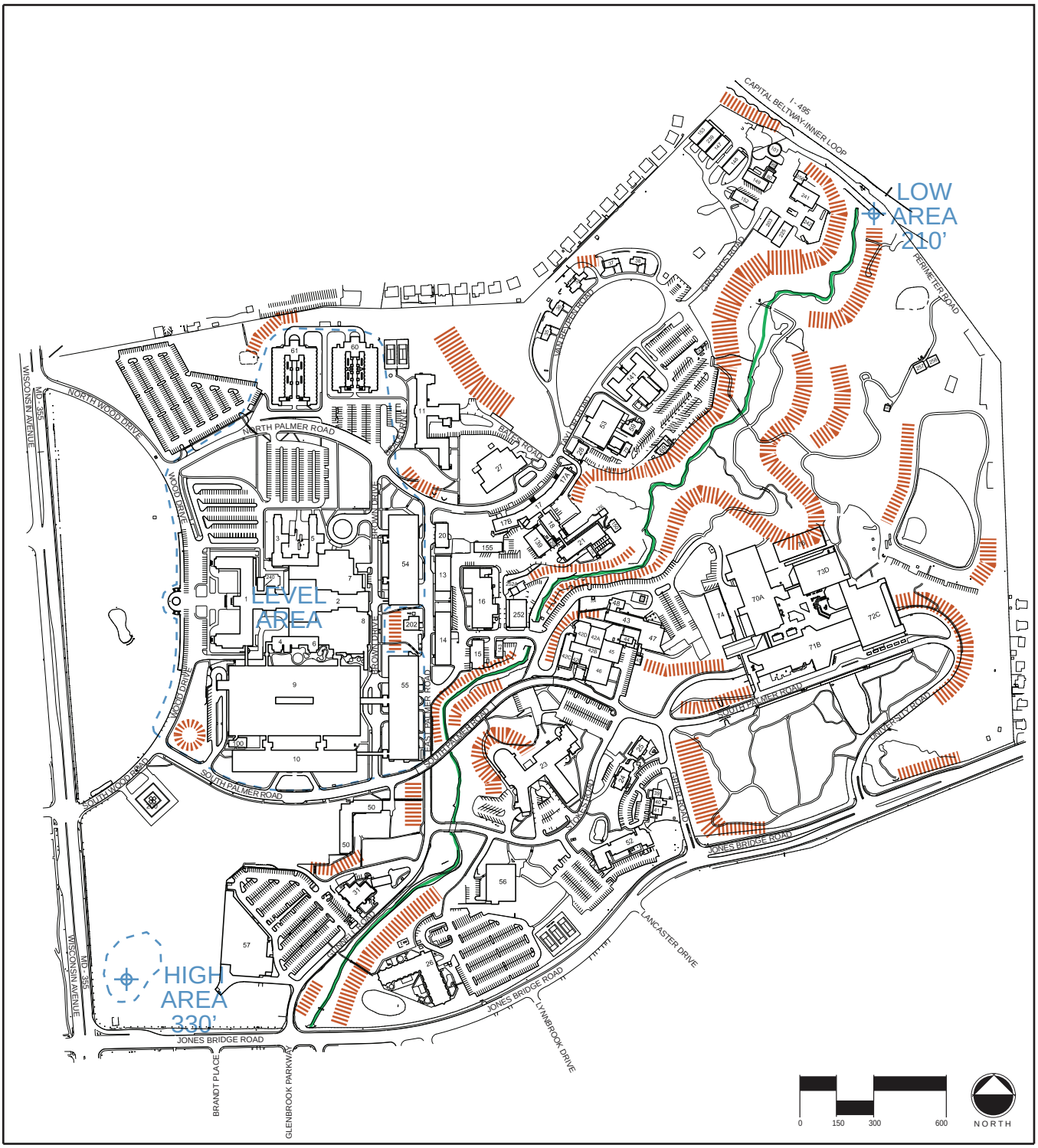
Figure 4-1

Aerial Photograph



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STEEP SLOPES (OVER 15%)
HIGH POINT / LOW POINT
STREAM

Figure 4-2

Existing Topography

4.2.2 Geology and Soils

There are no unique geological features within the NNMC campus. Maryland is part of six physiographic provinces. From the east to the west the provinces are the Atlantic Continental Shelf, Coastal Plain, Piedmont Plateau, Blue Ridge, Ridge and Valley and Appalachian Plateaus. The area of NNMC is in the Piedmont Plateau. This province is further divided into the Lowland and Upland Sections. NNMC is in the Upland Section.

Lying between the Coastal Plain and the Catoctin Mountain where the Blue Ridge Province begins, the Piedmont Plateau Province is composed of hard, crystalline igneous and metamorphic rock. The bedrock in the eastern Upland Section consists of schist, gneiss, gabbro, and other highly metamorphosed sedimentary and igneous rocks of probable volcanic origin. In several places these rocks have been intruded by granitic plutons and pegmatites. Deep drilling has revealed that similar metamorphic and igneous rocks underlie the sedimentary rocks of the Coastal Plain. Differential erosion of these contrasting rock types has produced a distinctive topography in this part of the Piedmont. (MDNR).

The Sykesville Formation and igneous rocks that flowed upward through the Sykesville Formation are the two geologic formations that underlie NNMC. The eastern half of NNMC is underlain by the rocks of the Sykesville Formation. These meta-sedimentary rocks were originally deposited as sediments, but have been transformed by high heat and pressure into crystalline rocks. The western half of NNMC is underlain by younger rocks that represent an igneous intrusion in the Skyesville Formation; that is, molten material flowed up through the already crystallized Sykesville. (NNMC DINRMP).

Soils are silt loams, which are generally well to excessively drained and are suitable for construction if located on relatively flat topography. These soils are subject to moderate to severe erosion hazards when slopes are greater than 8 percent. Therefore, construction within topography with these or greater slopes will have to incorporate more extensive erosion and sediment measures.

The silt loam nature of the surface soils along with steep slopes in some areas will result in special requirements for construction activities. Sediment from construction activities can damage storm systems and degrade receiving creeks. Once clays and silts are mobilized by the erosion process, they cannot be removed from the storm water without extended length detention or retention or chemical treatment. As a result, extensive erosion control measures along with effective sediment traps will be required for most projects within the campus.

No known area or areas of contaminated soil have been identified on the campus. (Figure 4-3 Existing Soils Map)

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1	GLENELG SILT LOAM 8 - 15% SLOPES
2	URBAN LAND
3	GLENVILLE SILT LOAM 0 - 3% SLOPES
4	BRINKLOW - BLOCKTON CH. SILT LOAM 15 - 25% SLOPES
5	GLENELG SILT LOAM 3 - 8% SLOPES
6	WHEATON SILT LOAM 0 - 8% SLOPES

Figure 4-3

Existing Soils Map

4.2.3 Water Resources

Surface water, ground water, flood plains, wetlands and water sheds are all examples of water resources to be considered on the campus.

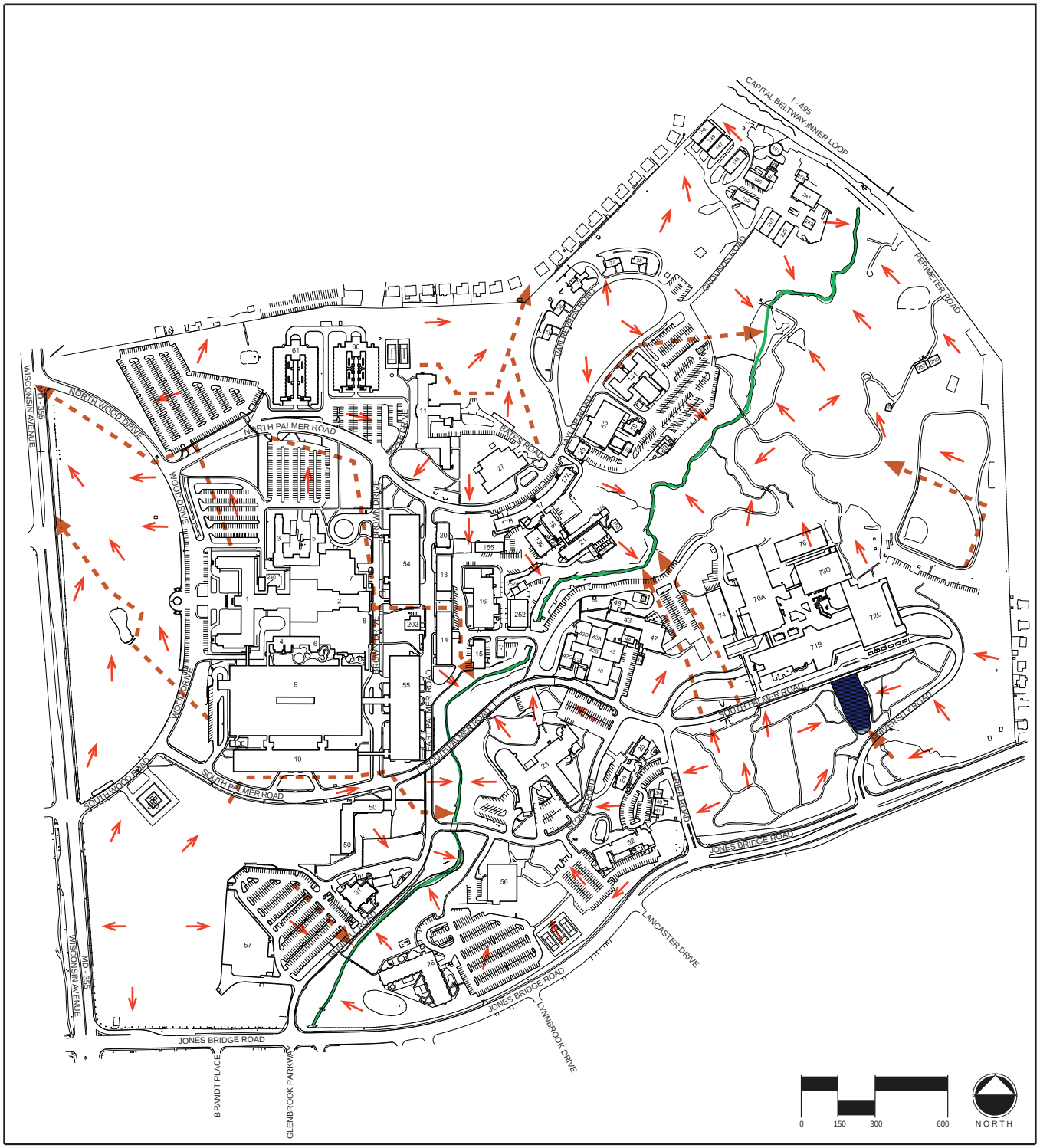
There are several areas of surface water on the campus. These surface water features are used effectively for storm water management. (Figure 4-4 Existing Hydrology) Lake Eleanor is a spring fed pond located in front of Building 1 within the historically protected view area. The pond south of the USUHS campus, is fed primarily from off-campus runoff. An in-stream pond in a tributary of Stoney Creek, located within the recreational area in the northeastern portion of the campus is effective at removing sediments but is not part of the storm water management plan. Three other ponds, one just west of the BEQs (Buildings 60 and 61), one adjacent to the Child Development Center (Building 26) and one adjacent to the Navy Lodge (Building 52), provide areas of retention for campus runoff.

In general, there are significant quantities of ground water that occur in the igneous and sedimentary rocks of the Piedmont Province. Movement of water through these rocks is restricted but water is extracted through fractures, saprolites and topographically low areas. (MDE) Based on surveys the depth of ground water varies from 20 to 50 feet below the surface. (RFP) (NIH)

No developed part of the campus is within a 100-year floodplain according to FEMA, Flood Insurance Rate Map, Montgomery Co., Maryland, panel 175 of 200, dated August 1, 1984. (FEMA) However, while not meeting the requirements of a floodplain for FEMA purposes, Stoney Creek does have a 100 year floodplain. While undefined, the extent of this floodplain is constrained by the steep topography along the creek.

Overall, wetlands are less abundant and diverse in the Piedmont Province compared to the Coastal Plain, due to greater topography, regional geology, a lower ground water table and lack of tidal influence. While the definition of wetlands varies based on source, there are potential areas on NNMC along the tributaries of Stoney Creek that are considered potential wetlands in NNMC's Draft Integrated Natural Resources Plan. Wetlands in Maryland are protected by the Non-tidal Wetlands Protection Program. (NNMC DINRMP and MDE)

Although there are no designated wetlands on NNMC, the campus is located within the Lower Rock Creek Watershed of Montgomery County. All of the Lower Rock Creek watershed is designated a restoration area. Efforts are being made to comprehensively examine and address stormwater retrofit, stream restoration and habitat improvement opportunities. Several tributaries have been extensively piped or channelized, but many areas of natural stream channel remain which may provide opportunities for habitat improvement. NNMC is participating in efforts to improve the area of Stoney Creek and tributaries on the campus that feed into the Rock Creek Watershed and eventually discharge into the Potomac.



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- STORMWATER RETENTION
- PIPED DRAINAGE
- OPEN STREAM
- SURFACE DRAINAGE

Figure 4-4

Existing Hydrology

4.2.4 Vegetation and Habitats

The existing landscape of the Bethesda campus consists of two different types: woodland stands found primarily on the eastern half of the campus where they buffer the adjacent residential neighborhoods and formal plantings found around developed areas.

The largest woodland areas at NNMC are located in the area north and south of the USUHS campus and along the tributaries of Stoney Creek. There are also forested buffers along roads and the perimeter of the campus. The woodlands are dominated by yellow poplar, white oak, and red oak. There are many non-native species in the woodlands from reforestation efforts. The Draft Integrated Natural Resources Management Plan 2000 identified six woodland areas on NNMC and provides a thorough analysis of the species in each area. This information is available in the Management Plan or the EIS.

Formal planting areas include building landscapes, street trees, and parking lot plantings. The plantings located around the developed potion of the campus appear to be in good health despite the urban character of development. In some cases the existing landscapes adjacent to buildings are in violation of current AT / FP Unobstructed Space requirements and should be considered for modifications as projects are pursued.

The groundcover in the formal planting areas is mainly lawn and foundation plantings while the woodland areas have been allowed to accumulate leaf litter creating a natural groundcover.

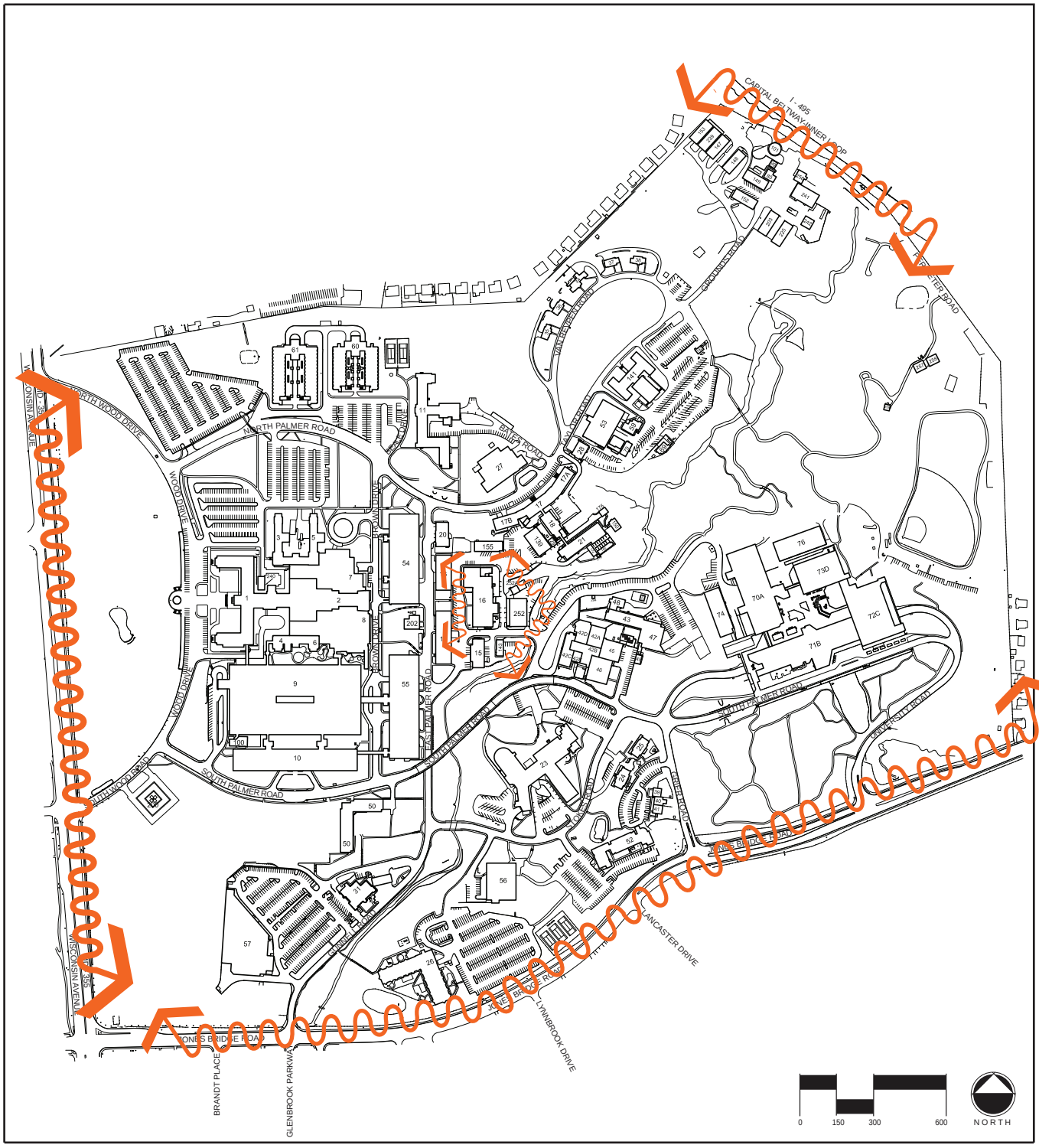
The natural areas on NNMC provide habitat for several wildlife species. The hardwood forest hosts deer, opossum, squirrels, raccoons, skunks and fox as well as a variety of birds and reptiles. In addition, the shrub and low level vegetation provides habitat for mice, meadow voles and shrews as well as the birds and reptiles. A complete list of the wildlife identified during surveys of NNMC can be found in the Draft Integrated Natural Resources Management Plan. These same surveys did not identify any endangered species on NNMC.

Maryland's Department of Natural Resources identified three species of birds inhabiting NNMC that are of Maryland State Special Concern, the great blue heron, red-shouldered hawk, and the eastern bluebird. (FEIS)

4.2.5 Noise

NNMC is located in a highly developed area. There is both internal and externally generated noise at the NNMC campus. (Figure 4-5 Noise Sources)

The major external sources of noise include in approximate order of significance I-495 (Capital Beltway Inner Loop), Rockville Pike, and Jones Bridge Road. In the case of I-495, with the exception of the maintenance and storage buildings located adjacent to the Interstate, a significant



SOURCE OF NOISE

Figure 4-5

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Noise Sources

amount of noise is attenuated by the band trees along the eastern and northeastern portions of the campus. Rockville Pike is a relatively low speed road compared to I-495 as a result the intensity of the noise is less than I-495. In addition, the extensive lawn area along the western side of the campus provides a significant set back from the noise source. As a result, a large portion of this noise is attenuated. Noise generated from traffic on Jones Bridge Road to the south is also buffered for the most part by stands of trees and topography.

Within the campus there are also noise considerations such as the Bethesda helicopter landing pad, Building 252 (cooling towers) and building 16 (energy plant). A helipad is located in the southwestern portion of the campus adjacent to the South Gate. It is located away from major populated areas. Since NNMC serves the President for medical care, this helipad is used by the President as required. It is also used for medical emergencies. In general, however, the air traffic volume is low. Some noise is produced by the energy plant located at the center of campus. Noise generated from these facilities are shielded from the main medical complex to the west by parking structures, and other buildings to the north, south and west by stands of trees, secondary buildings and topography.

Additional variable noise results from day-to-day activities of people using the campus, exterior maintenance and grounds crews.

4.2.6 Airspace

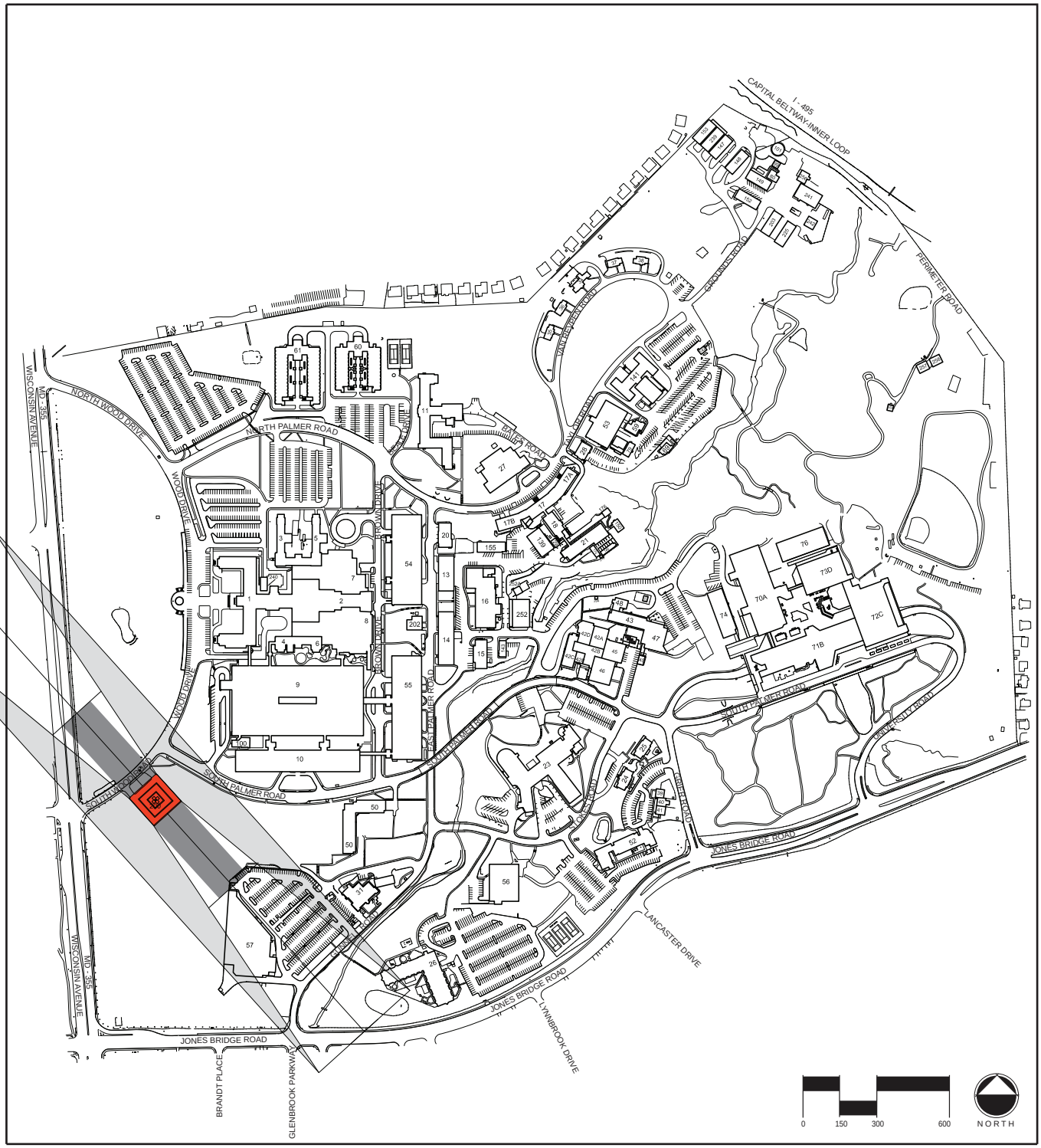
The location of the helipad is driven by adjacencies to required medical services and can not be relocated. (Figure 4-6 Airspace Restrictions, Figure 4-7 Helipad Clearances and Surfaces) As such, there are specific criteria to protect the airspace surrounding this landing area. The criteria is identified in UFC 3-260-01, November 2002 (and changes May 2006), United Facilities Criteria, Airfield and Heliport Planning and Design. The sizes of the primary surface, clear zones, approach/departure, transitional surfaces, and the accident potential zone (APZ) are identified with specific restrictions associated with each.

4.3 Built Environments

4.3.1 Land Use

The built environment of NNMC consists of approximately 90 buildings, roadways, parking structures and surface parking, walks, utilities and supporting structures for the medical mission and tenants located on the campus.

The built environment can be divided into distinct existing land uses. (Figure 4-8 Existing Functional Zones) In general, the land uses can be divided into medical, administrative, permanent housing, temporary housing, community services, and education.



PRIMARY SURFACE
CLEAR ZONE
APPROACH DEPARTURE (SLOPED)
TRANSITIONAL SURFACE (SLOPED)

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Figure 4-6

Airspace Restrictions

Figure 4-7 Helipad Clearances and Surfaces

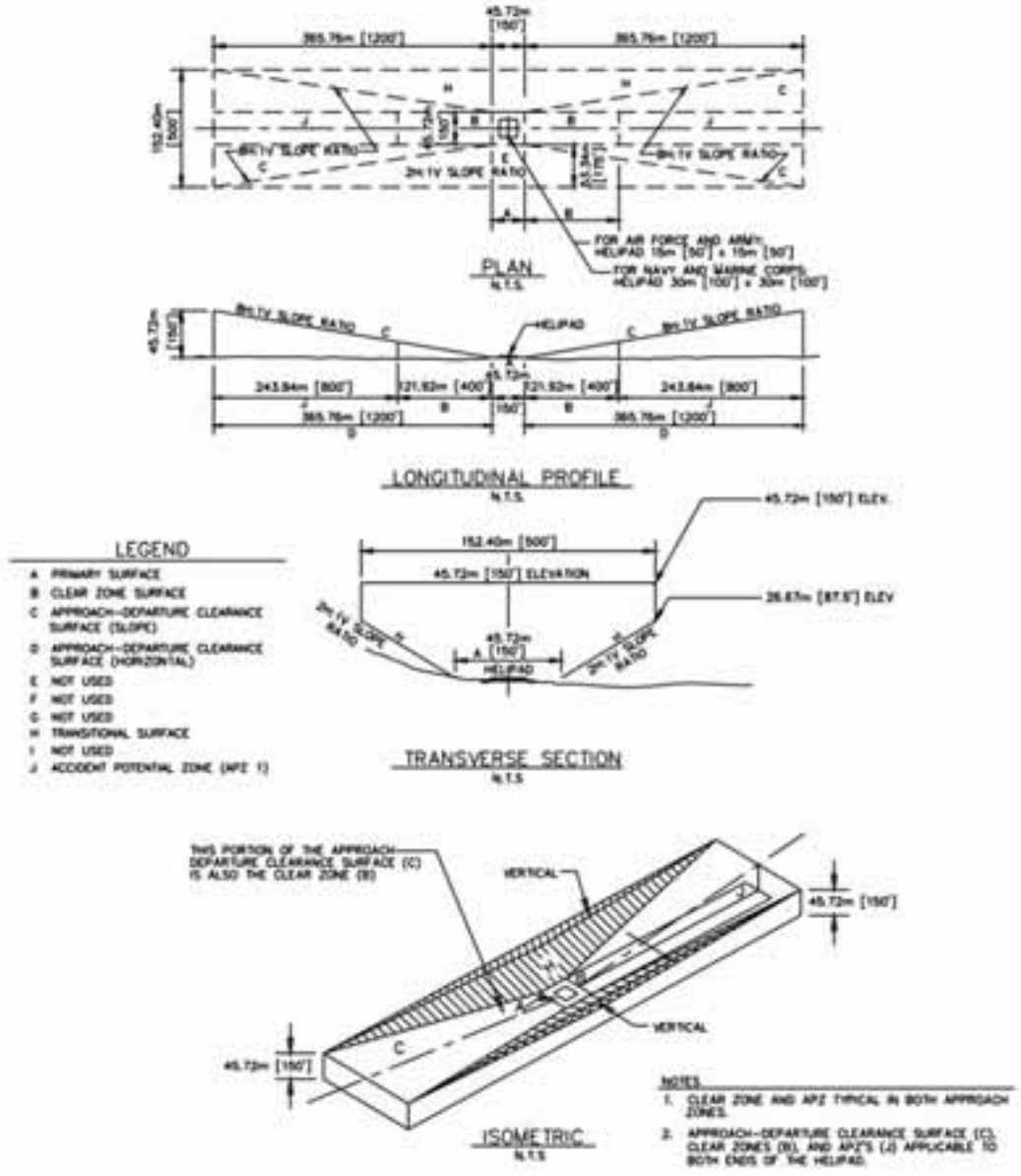

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Figure 4-7
(Source: UFC 3-260-01)

Helipad Clearances and Surfaces

The medical core is located in the center of the western portion of the campus, and consists of Buildings 1 through 10. Supporting facilities and central utilities are located to the east of this core. Some admin functions are located within the medical core, and others with less patient contact are located in outlying facilities surrounding this core. Permanent housing is located to the north of the campus and consists of Buildings 60 and 61 for enlisted quarters and five Senior Officer/Flag single family units. Three additional single family homes are located adjacent to the Navy Lodge. Temporary housing, in general is located at the southern edge of the campus in the form of the Navy Lodge, Building 52, and the Fisher Houses, Buildings 24 and 25. Building 50 is also considered temporary housing and is used for patients requiring frequent follow up visits that no longer need full time care in a hospital setting. It should be noted that Buildings 50, 60 and 61 can all be used as the need dictates for patients requiring frequent follow up care or permanent party occupants. Recent projects have been initiated to improve the accessibility in these facilities increase their flexibility for these options. Community Services are located in the southwestern portion of the campus. Some education functions are integral to the core medical buildings but USUHS, the premier medical university and the education emphasis on campus is located in the western portion of the site. (Figure 4-9 Existing Building Functions)

4.3.2 Landscape Patterns

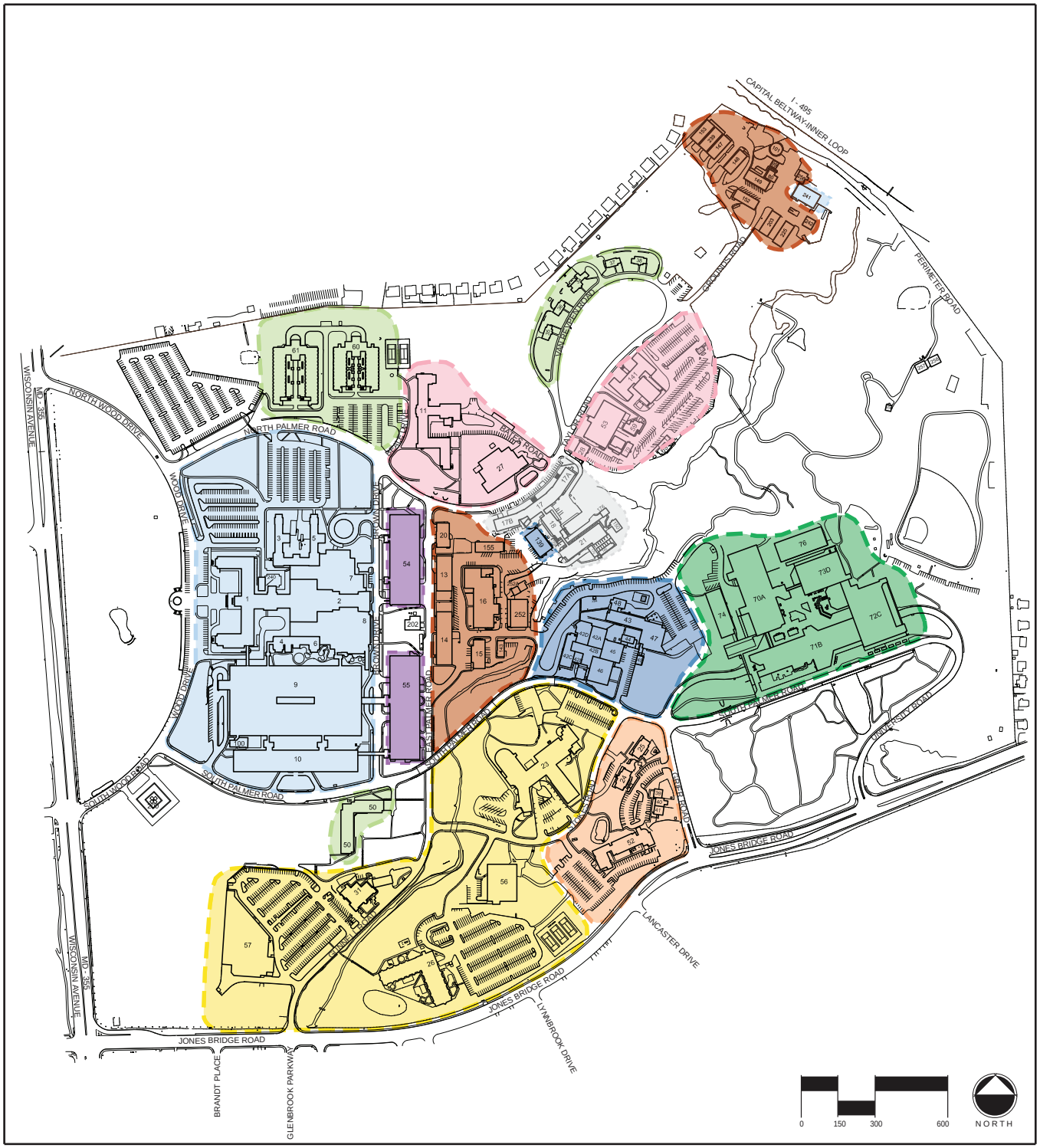
The landscape patterns of the campus can be simplified into two categories: man-made and natural. (Figure 4-10 Existing Landscape Character)

The man-made landscape pattern is most easily described as areas where development has removed the native landscape and replaced it with a more formal landscape. Because of the age of the campus many of the plantings have matured and appear to be natural to the site. The man-made landscape pattern can be seen in the protected visual area of Tower One, along streets and parking areas, and adjacent to buildings. The steeply sloping topography in some areas of the campus allows for small pockets of native trees to remain inside the man-made landscape.

The natural landscape pattern consists of native woodland areas east of the main campus, adjacent to Stoney Creek and the landscape buffers at the perimeter of the campus.

4.3.3 Building Patterns

The building patterns on the campus are varied. The front of the campus follows the grid identified by the original tower. The tower and the early structures in the front of the campus are formal and symmetrical, with the focus and apex of the symmetry in line with the center historic tower. The open lawn preserved in the front of the campus opens the view to this formality and symmetry that identifies the campus, and as such is part of the protected historical view shed. Even the logistics and plant facilities directly related to the medical core follow the orthogonal grid created



MEDICAL
ADMINISTRATION
PERMANENT PARTY HOUSING
COMMUNITY SERVICES
RESEARCH
PARKING
EDUCATION
TEMPORARY HOUSING
MAINTENANCE
VACANT

Figure 4-8

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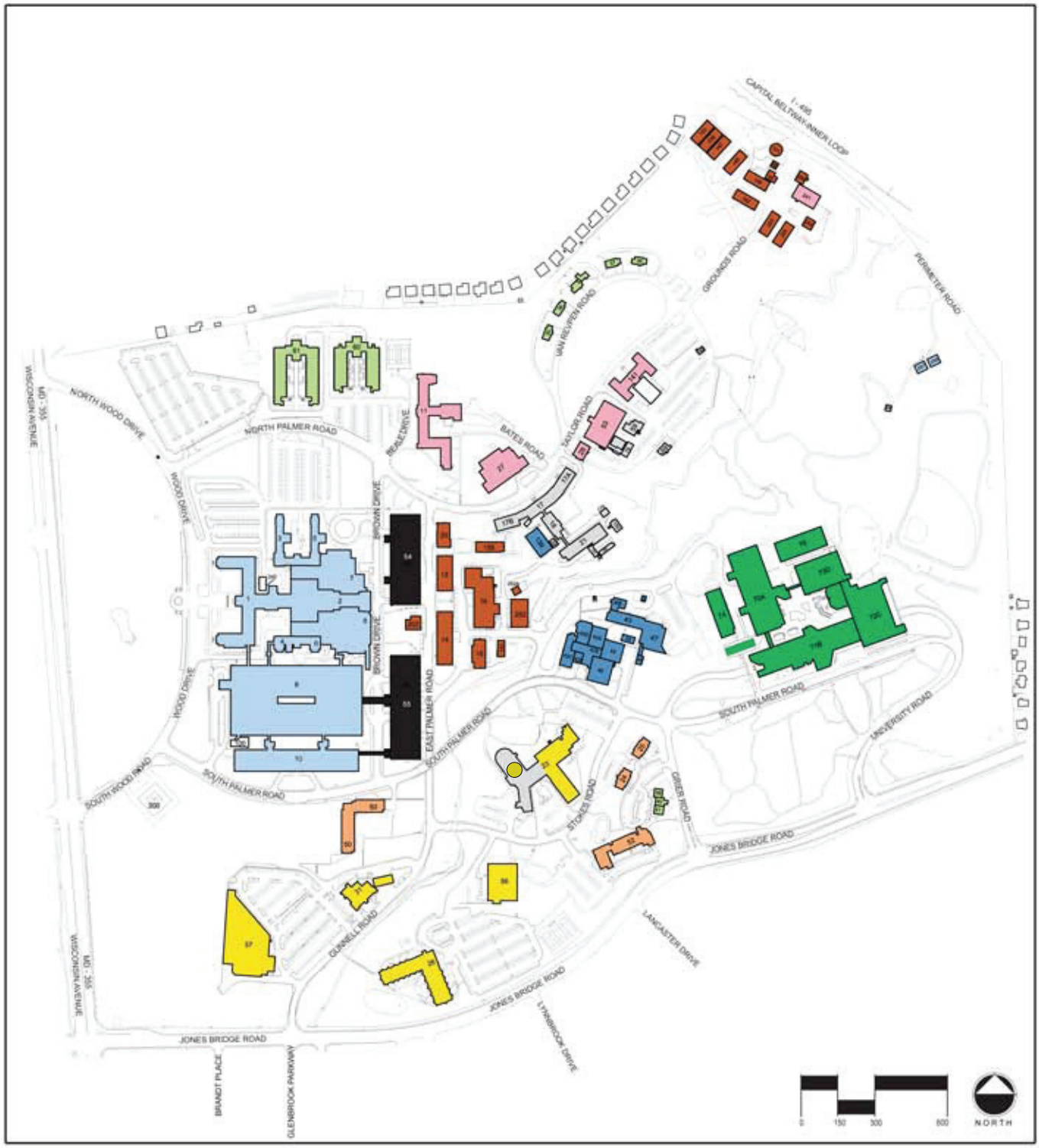
Existing Functional Zones



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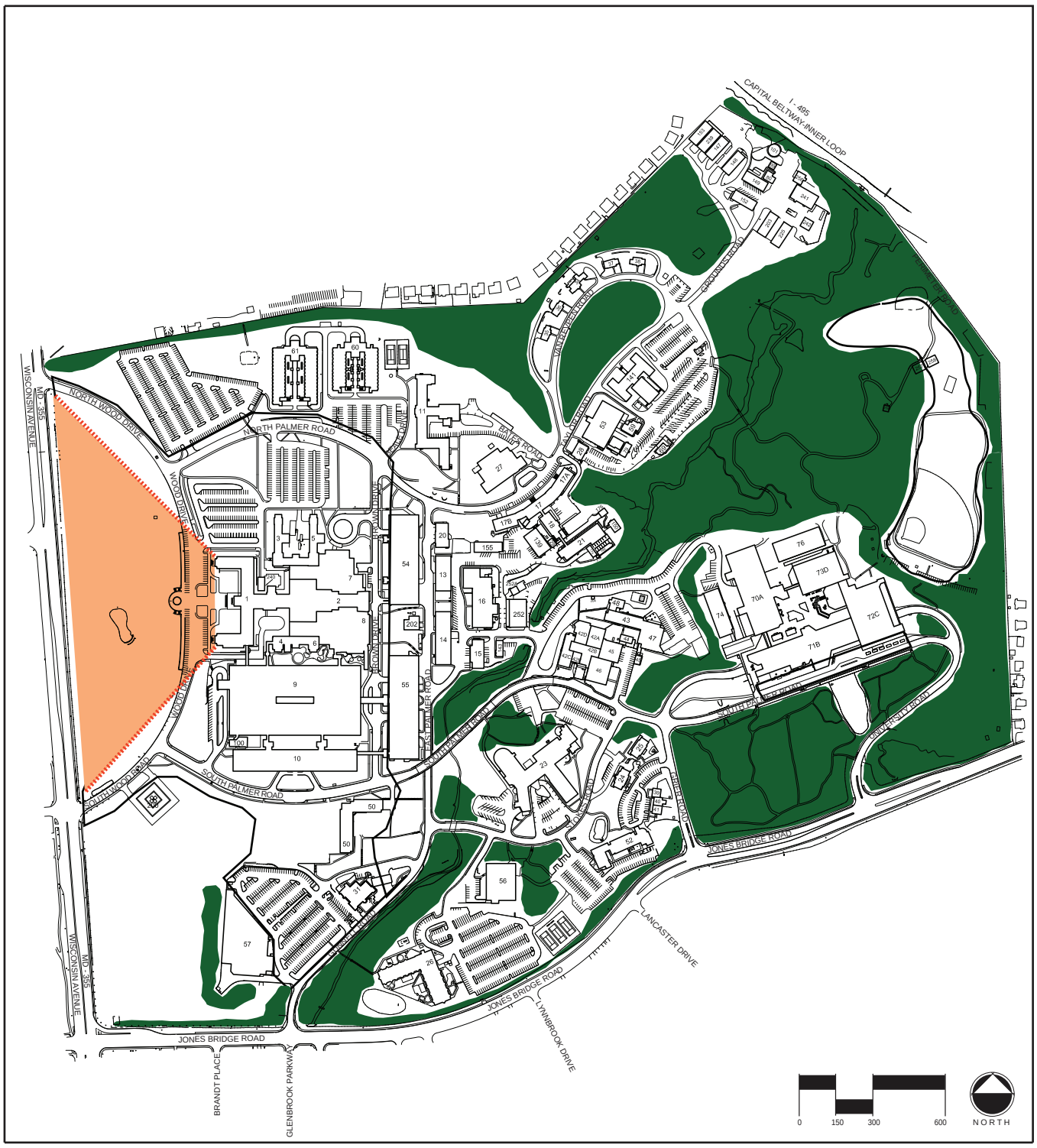
- MEDICAL
- ADMINISTRATION
- PERM PARTY HOUSING
- COMMUNITY SERVICES
- RESEARCH
- EDUCATION
- TEMPORARY HOUSING
- MAINTENANCE
- PARKING
- VACANT

Figure 4-9

Existing Building Uses

Figure 4-10 Existing Landscape Character



PROTECTED HISTORIC LANDSCAPE
"NATURAL" LANDSCAPE
MAINTAINED LANDSCAPE

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Figure 4-10

Existing Landscape Character

by these structures. Recent additions, for example Buildings 9 and 10, followed the grid but did not maintain the symmetry of the original design.

The proposed conceptual designs in the BRAC contracts recently awarded are very sensitive to the symmetry of the front campus and propose construction consistent with the Master Plan that will maintain and improve this key element.

The back of the campus does not follow the orthogonal grid and is less formal relating to the more natural course of Stoney Creek and the surrounding topography. While there is no formal grid, the facilities are still organized into clustered groupings. The groupings are functionally aligned and often have independent focuses within their clusters. The USUHS, for example, has a well defined courtyard and pedestrian system linking the buildings of the cluster and creating an internal focus. A similar, but smaller scale, concept applies to the residential housing in Buildings 60 and 61. The single family homes constitute another distinctive cluster with a focus on the open area providing a buffer for these historic facilities. The AFFRI is another cluster sharing a common purpose that is comprised of multiple buildings and additions over the years.

The community cluster in the south end of the campus is a large grouping of services in itself but also has small clusters within its boundaries. The lodging grouping is located at the east end and the retail grouping at the west end with other community services in between.

Overall, the campus patterns do not relate to any particular elements or grids in the surrounding areas or established in the community, with one exception. The dominant axes created by the original structures are very strong and the east west axis in particular aligns with the Central Administration Building of the National Institutes of Health west of the campus.

4.3.4 Places and Open Spaces

The most recognizable place and open space on the Bethesda campus is the front lawn of Tower One. (Figure 4-11 Existing Places and Open Spaces) This front lawn is a more passive space used for viewing or individual activities, since security prefers this area remains unpopulated. Most often outdoor places on campus are courtyards defined by building edges. Some of these courtyards are easily accessible, well defined by building edges, and have landscape and other amenities to attract visitors. Other courtyards are not accessible, seem too confined and are difficult to maintain.

Several open spaces exist on the east side of the campus. East of the USUHS building there is an existing baseball field and running track. North and south of the USUHS building are large woodland areas that contain asphalt walking trails which are heavily used for active and passive activity.

4.3.5 Building Heights and Massing

Building heights on campus range from 1 story and as little as 8 feet (2.44 meters) above grade for some very small storage buildings to 20 stories and 264 feet (80.47 meters) for the historic tower, Building 1. (Figure 4-12 Existing Building Heights) No other structure on campus comes close to the height of the tower, with Building 10 the next highest structure at 116 feet (35.36 meters). Other buildings in the medical core of the campus, Buildings 1 through 10, range from 48 to 72 feet (14.63 to 21.95 meters) in height. This core of buildings, located to the center front of the campus, are the highest group of buildings to include the adjacent two parking decks, Buildings 54 and 55 which are approximately 75 feet (22.5 meters).

The USUHS buildings all are approximately 50' to 60' in height and are the next highest identifiable cluster on campus.

In general these are the two areas of any significant height on campus and represent the two largest building mass clusters. Both height and massing are reduced toward the perimeter of the campus, particularly adjacent to the residential areas to the north and east where the single family flag officers and the recreational land uses create appropriate buffers.

4.3.6 Views and Prominent Features

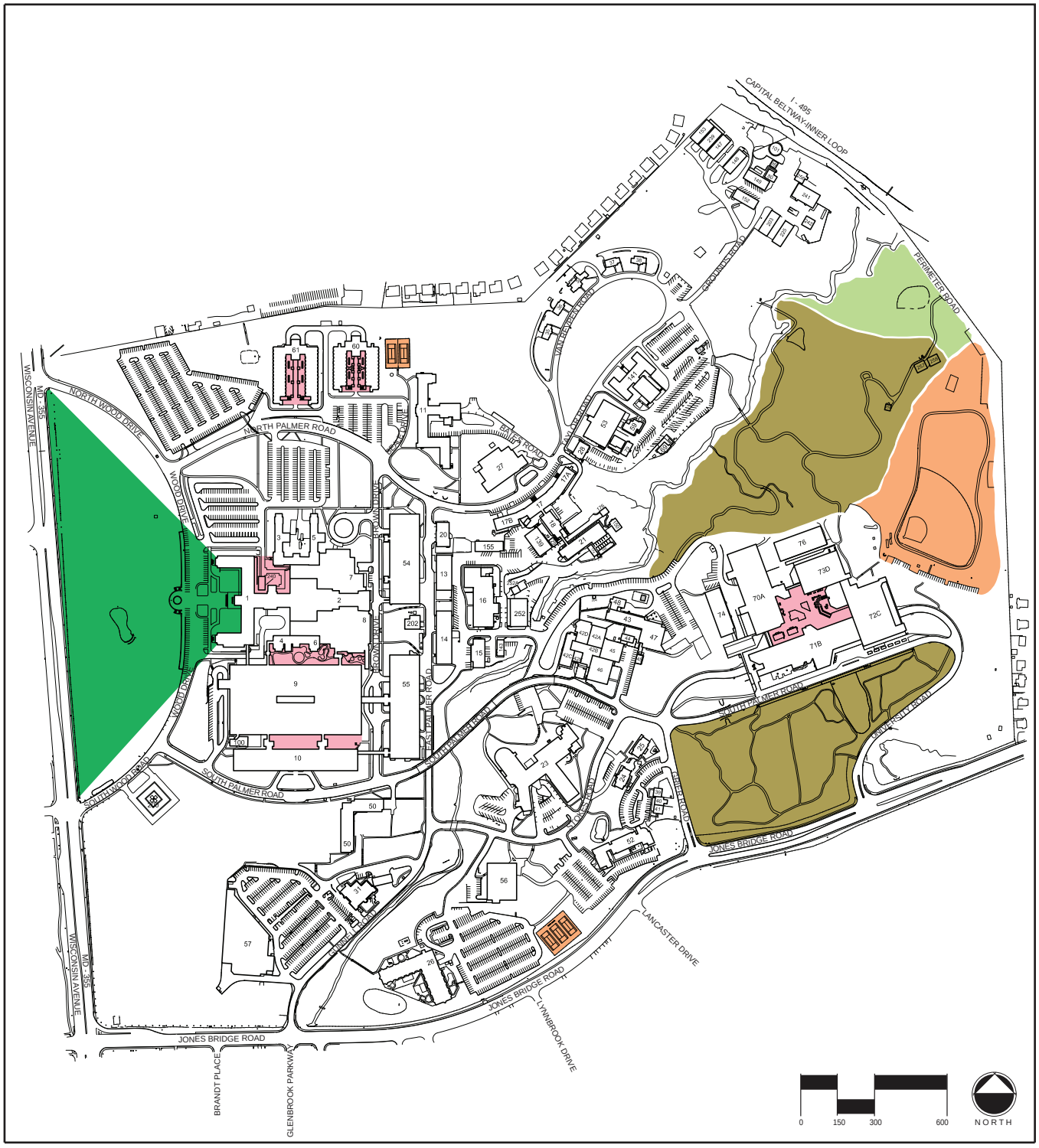
Views to the campus vary and are intentionally limited or emphasized based on the locations. (Figure 4-13 Existing Views and Prominent Features) The view of the most prominent feature on the campus, the landmark and signature structure of Building 1's tower, is emphasized. The view from Rockville Pike of the historic structure is protected based on its listing in the National Register, and ensures the open area in front of Building 1 will remain. It is by far the most recognized view of the NNMC campus.

Other views to the campus are limited due to the natural topography and landscape buffers of the campus. The natural landscape in the north, east and south of the USUHS complex provides a good buffer to the adjacent land uses and limits views of the campus.

The area adjacent to the corner of Jones Bridge and Wisconsin, has significant topography and landscape that also limits the view of the campus from this perspective.

Access routes and gate locations on the perimeter give open views to the campus as well as some developed areas without landscape buffers close to the perimeter such as the south edge by the Child Development Center and Lodging Cluster.

Within the campus, the same protected view of the tower provides a vista from the tower of the open area and front grounds. Topography and buildings limit the views internally to other area of the campus. There are internal views created by building clusters that relate to those functional groupings.



PROTECTED OPEN SPACE
WOODLAND WALKING TRAILS
ACTIVE RECREATION SPACE
PASSIVE RECREATION SPACE
COURTYARDS

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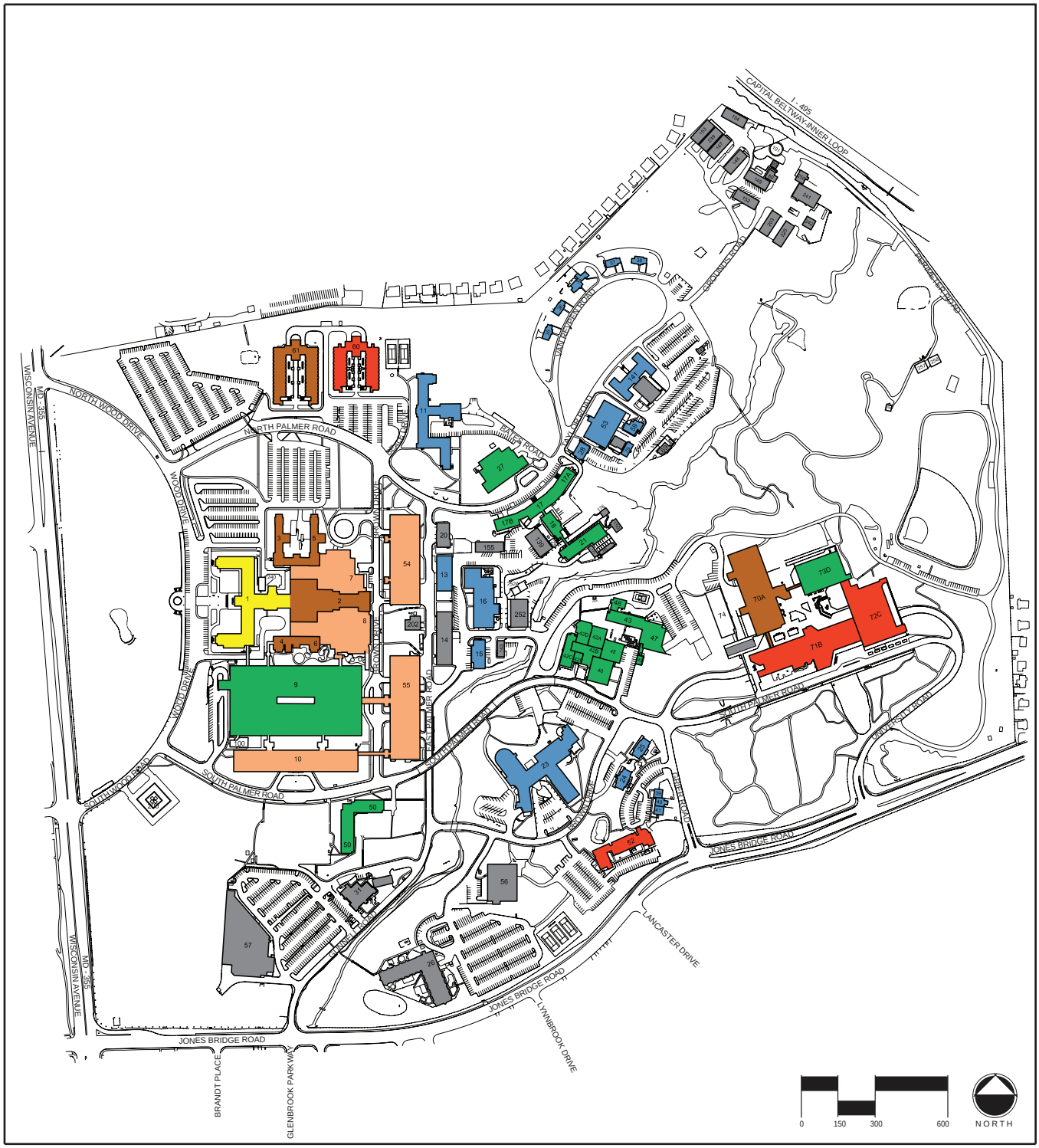
Figure 4-11

Existing Places & Open Spaces

Figure 4-12 Existing Building Heights



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- 1 STORY
- 2 STORIES
- 3 STORIES
- 4 STORIES
- 5 STORIES
- 6 - 14 STORIES
- 15 - 20 STORIES

Figure 4-12

Existing Building Heights

PROMINENT FEATURES
PROTECT VIEWS
VISUAL SCREEN
VIEWS FROM THE COMMUNITY

Figure 4-13

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Existing Views & Prominent Features

4.3.7 Building Areas and Facility Use

There are approximately 83 buildings on campus. These are occupied by a variety of functions to include medical, administrative, research, support, retail, community services, and education as well as tenant space. Within individual facilities there is often of mix of functional uses.

There is approximately 4.68 million building gross square feet (GSF) on campus based on real property records. There are eleven individual buildings that are over 100,000 GSF not including the two parking structures. Buildings 1 through 10, the medical core buildings total approximately 1.56 million GSF which is approximately 33% of the overall campus GSF.

The following Table provides facility number, NNMC building name, area (square fee/SF), year of construction, category code and nomenclature for campus structures per the Real Property cards available. (RPR)

Tables 4.3.7 NNMC Building Structures per Real Property Records

Source: *(RPR)* Real Property Records from NNMC

4.3.8 Building Populations

In order to assess the impacts of the growth in population on the campus in terms of utilities, parking and traffic, a reasonable approach to the distribution of the population had to be determined. In order to apply a consistent approach, the SF/occupant identified by Life Safety and building codes were used based on the primary function of the buildings. Recognizing the

Table 4.3.7 NNMC Building Structures per Real Property Records

				CATEGORY CODE INFORMATION		
FACILITY NO	NNMC FACILITY NAME	AREA (SF)	YEAR BUILT	PRIME USE	LONG DESC	MDESC
1	DENTAL CLINIC	244846	1941	54010	DENTAL CLINIC	DENTAL CLINICS
2	PERSONNEL SUPPORT & SERVICES	105104	1941	74009	EXCHANGE SERVICE-OUTLETS	ADMINISTRATIVE BUILDINGS
3	ADMINISTRATIVE BUILDING	37151	1943	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
4	ADMIN/MED PHOTO	16534	1941	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
5	ADMINISTRATIVE BUILDING	42463	1943	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
6	ADMIN/MED PHOTO	19908	1942	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
7	MEDICAL/HOSPITAL	83575	1963	51010	HOSPITAL	MEDICAL CENTER/HOSPITAL
8	HOSPITAL	100235	1963	55010	HOSPITAL	MEDICAL CENTER/HOSPITAL
9	SERVICE BLOCK OF REPL HOSP	585473	1980	51010	HOSPITAL	MEDICAL CENTER/HOSPITAL
10	NURSING TOWER OF REPL HOSP	328000	1980	51010	HOSPITAL	MEDICAL CENTER/HOSPITAL
11	ADMINISTRATIVE BLDG	72946	1941	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
13	FACILITIES MGMT SHOPS	18144	1941	21910	PUBLIC-WORKS SHOP	MAINTENANCE-INSTALLATION
14	FACILITIES MGMT BLDG	26840	1941	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
15	SHOP AND UTILITY BLDG.	10752	1944	21356	WOODWORKING SHOP	MAINTENANCE -SHIPS SPARES
16	HEAT/REFRIG PLANT	47744	1941	82109	HEATING-PLANT BUILDING	HEAT-SOURCE
17	VACANT BLDG.	82173	1942	21910	PUBLIC-WORKS SHOP	VACANT BLDG.
18	VACANT BLDG.	13553	1942	31025	BIOLOGICAL LABORATORY	VACANT BLDG.
20	FIRE HOUSE	4895	1944	73010	FIRE STATION	COMMUNITY-FACILITIES - PERS SUPRT&SVCS
21	VACANT BLDG.	38400	1946	61010	ADMINISTRATIVE OFFICE	VACANT BLDG.
22	VACANT BLDG.	180	1944	31915	RDT&E STORAGE LABORATORY	MISCELLANEOUS ITEMS AND EQUIPMENT
23	RECREATION BUILDING	90756	1945	74060	COMMISIONED OFFICERS' MESS OPEN	COMMUNITY FACILITIES-MORALE
24	FISHER HOUSE	4864	1991	74020	TEMPORARY LODGING	COMMUNITY FACILITIES-MORALE
25	FISHER HOUSE II	4864	1994	74020	TEMPORARY LODGING	COMMUNITY FACILITIES-MORALE
26	CHILD DEVELOPMENT CENTER	22720	1995	74074	CHILD DEVELOPMENT CENTER	COMMUNITY FACILITIES-MORALE
27	DATA SERVICES CENTER	54800	1990	61020	DATA-PROCESSING CENTER	ADMINISTRATIVE BUILDINGS
28	COLORIMETRY BUILDING	5796	1952	21710	ELECNX&COMM MAINTENANCE SHOP	MAINTENANCE-ELECTRONICS AND COMMUNICATIONS EQUIPMENT
29	VACANT BLDG.	630	1954	31027	ENVIRONMENTAL LABORATORY	VACANT BLDG.
31	EXCHANGE MCDONALDS&MINIMART	9057	1996	74026	INSTALLATION RESTAURANT	COMMUNITY FACILITIES-MORALE
42	AFRRI LABORATORY	60555	1962	61010	LABORATORY	SCIENCE LABORATORIES
43	AFRRI LABORATORY	22477	1962	31021	LABORATORY	SCIENCE LABORATORIES
44	AFRRI LABORATORY	1404	1962	31021	LABORATORY	SCIENCE LABORATORIES
45	LABORATORY & SUPPORT FAC	21372	1967	31021	LABORATORY	SCIENCE LABORATORIES
46	LAB AND TECH SUPPORT BLDG	36136	1970	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
47	RESEARCH BLDG AFRRI	32940	1980	31021	LABORATORY	SCIENCE LABORATORIES
48	WASTE HANDLING	3824	1988	83139	WASTE-HANDLING BUILDING	SEWAGE-AND-INDSTRIAL-WASTE
49	VACANT BLDG.	364	1980	31915	RDT&E STORAGE LABORATORY	VACANT BLDG.

				CATEGORY CODE INFORMATION		
FACILITY NO	NNMC FACILITY NAME	AREA (SF)	YEAR BUILT	PRIME USE	LONG DESC	MDESC
50	E M BARRACKS	50557	1968	72111	BACHELOR ENLISTED QUARTERS E1/E4	UNACCOMPANIED PERSONNEL HOUSING-ENLISTED PERSONNEL
52	NAVY LODGE GUEST HOUSE	33019	1971	74020	TEMPORARY LODGING	COMMUNITY FACILITIES-MORALE
53	ENVIRONMENTAL HEALTH EFFECTS	35209	1976	31027	ENVIRONMENTAL LABORATORY	SCIENCE LABORATORIES
54	MEDICAL WAREHOUSE/PARKING ST	330040	1977	73080	EMPLOYEES PARKING BUILDING	COMMUNITY-FACILITIES - PERS SUPRT&SVCS
55	SOUTH PARKING GARAGE	386107	1980	73080	EMPLOYEES PARKING BUILDING	COMMUNITY-FACILITIES - PERS SUPRT&SVCS
56	BOWLING ALLEY	18215	1979	74040	BOWLING CENTER	COMMUNITY FACILITIES-MORALE
57	NAVY EXCHANGE RETAIL STORE	48029	1979	74001	EXCHANGE RETAIL-STORE	COMMUNITY FACILITIES-MORALE
59	USUHS FACILITY	5036	1989	31027	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
60	UEPH BUILDING	105848	1986	72111	BACHELOR ENLISTED QUARTERS E1/E4	UNACCOMPANIED PERSONNEL HOUSING-ENLISTED PERSONNEL
61	BEQ BUILDING	141053	1993	72111	BACHELOR ENLISTED QUARTERS E1/E4	UNACCOMPANIED PERSONNEL HOUSING-ENLISTED PERSONNEL
69	VACANT BLDG.	1344	1991	31029	LABORATORY	VACANT BLDG.
70	USUHS BUILDING A	311099	1978	17120	APPLIED INSTRUCTION BUILDING	TRAINING BUILDINGS
71	USUHS BUILDING B & GARAGE	282955	1980	17120	APPLIED INSTRUCTION BUILDING	TRAINING BUILDINGS
72	USUHS BUILDING C	287080	1980	17120	APPLIED INSTRUCTION BUILDING	TRAINING BUILDINGS
73	USUHS BUILDING D	189935	1980	73080	EMPLOYEES PARKING BUILDING	COMMUNITY-FACILITIES - PERS SUPRT&SVCS
74	USUHS STORAGE FACILITY	12768	1989	44110	GENERAL WAREHOUSE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
79	USUHS FACILITY	960	1994	31027	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
80	STORAGE BUILDING	1064	1990	21910	PUBLIC-WORKS SHOP	STORAGE
139	RESEARCH BLDG	6760	1945	31027	ENVIRONMENTAL LABORATORY	SCIENCE LABORATORIES
141	SCHOOL BUILDING	44040	1944	61010	ADMINISTRATIVE OFFICE	ADMINISTRATIVE BUILDINGS
142	SATELLITE PHARMACY	600	1996	51010	HOSPITAL	MEDICAL CENTER/HOSPITAL
143	LUMBER SHED	1848	1944	21977	PUBLIC-WORKS MAINTENANCE STORAGE	MAINTENANCE-INSTALLATION
146	VACANT BLDG.	1008	1946	44135	GENERAL STORAGE SHED	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
147	BUTLER HUT/MATERIAL/	4000	1949	44110	GENERAL WAREHOUSE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
148	BUTLER BUILDING /MATERIAL/	4040	1949	44110	GENERAL WAREHOUSE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
149	BUTLER HUT /GROUNDS FORCE/	4040	1949	21920	PAVEMENT AND GROUNDS EQUIPMENT SHED	MAINTENANCE-INSTALLATION
152	DISPOSAL BUILDING	4000	1951	44110	GENERAL WAREHOUSE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
153	VACANT BLDG.	4000	1951	44110	GENERAL WAREHOUSE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
155	BUTLER HUT /GARAGE SHOP/	4633	1952	21420	AUTOMOTIVE-VEHICLE MAINTENANCE SHOP	MAINTENANCE

				CATEGORY CODE INFORMATION		
FACILITY NO	NNMC FACILITY NAME	AREA (SF)	YEAR BUILT	PRIME USE	LONG DESC	MDESC
174	VACANT BLDG.	1008	1950	44135	GENERAL STORAGE SHED	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
176	VACANT BLDG.					
177	TUNNEL	0	1943	89046	UTILITY TUNNEL	MISCELLANEOUS-UTILITIES
203	BUTLER BUILDING/AFRRI/	4000	1964	31915	RDT&E STORAGE LABORATORY	MISCELLANEOUS ITEMS AND EQUIPMENT
204	WASTE CONTROL	121	1962	83139	WASTE-HANDLING BUILDING	SEWAGE-AND-INDSTRL-WASTE - TRTMT&DISPOSAL
219	VACANT BLDG.	70	1945	31915	RDT&E STORAGE LABORATORY	MISCELLANEOUS ITEMS AND EQUIPMENT
225	PAV/GRNDS EQ SH	4040	1968	21920	PAVEMENT AND GROUNDS EQUIPMENT SHED	MAINTENANCE-INSTALLATION
239	STORAGE-COVERED	4000	1973	44110	GENERAL WAREHOUSE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
241	TRI-SERVICE BLOOD BANK	6042	1975	53020	LABORATORY	LABORATORIES
244	UTILITY TUNNEL	138	1942	89046	UTILITY TUNNEL	MISCELLANEOUS-UTILITIES
245	STEAM TUNNEL BLDG 16 & 2	373	1940	89046	UTILITY TUNNEL	MISCELLANEOUS-UTILITIES
246	UTILITY TUNNEL BLDGS 16,55,7	516	1980	89046	UTILITY TUNNEL	MISCELLANEOUS-UTILITIES
252	COOLING TOWER	10584	1977	82610	REFRIGERATION/AIR CONDITIONING PLANT BUILDING	REFRIGERATION-AIRCONDITIONING
254	WATER METER STRUCT(POTABLE)	60	1983	84209	POTABLE-WATER DISTRIBUTION BUILDING	POTABLE-WATER -DISTRIBUTION SYSTEM
255	WATER METER HOUSE	135	1979	84209	POTABLE-WATER DISTRIBUTION BUILDING	POTABLE-WATER -DISTRIBUTION SYSTEM
256	PCB STORAGE BUILDING	1575	1975	83141	HAZARDOUS WASTE STORAGE AND TRANSFER FACILITY	SEWAGE-AND-INDSTRIAL-WASTE
259	RECREATION HEAD	361	1980	73075	PUBLIC TOILET	COMMUNITY-FACILITIES - PERS SUPRT&SVCS
263	SUPPLY TUNNEL	2160	1980	44140	UNDERGROUND STORAGE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
264	MATERIAL HANDLING TUNNEL	4500	1980	44140	UNDERGROUND STORAGE	GENERAL-SUPPLY-STRG&SPLY - OPNS BLDGS
310	TUNNEL, BLDG 54 - 2	188	1980	89046	UTILITY TUNNEL	MISCELLANEOUS-UTILITIES
311	STANDBY GENERATOR BLDG 9&10	2128	1980	81160	STAND-BY GENERATOR PLANT (EXCLUDE NO-BREAK UNITS)	ELECTRIC POWER-SOURCE
315	UTILITY TUNNEL BLDG 252-16	360	1979	89046	UTILITY TUNNEL	MISCELLANEOUS-UTILITIES
700	GAS PIPE LINE	0	1942	82410	GAS-MAINS	HEAT -GAS TRANSMISSION
811	ROADS	4167	1942	85110	ROADS	ROADS
821	SIDEWALKS	732	1942	85220	SIDEWALK	SIDEWALKS - AND OTHER PAVEMENTS
A	NNMC QTRS A F&GOQ	5613	1941	71144	FUND HOUSING BEFORE-1950 -O7-THRU-O10	FAMILY-HOUSING - DWELLINGS & GARAGES
B	NNMC QTRS B F&GOQ	4415	1941	71144	FUND HOUSING BEFORE-1950 -O7-THRU-O10	FAMILY-HOUSING - DWELLINGS & GARAGES
C	NNMC QTRS C 0-6 QTRS	4270	1941	71143	FUND HOUSING BEFORE-1950 -O6	FAMILY-HOUSING - DWELLINGS & GARAGES
D	NNMC QTRS D 0-6 QTRS	4415	1941	71143	FUND HOUSING BEFORE-1950 -O6	FAMILY-HOUSING - DWELLINGS & GARAGES
E	NNMC QTRS F&GOQ	4270	1941	71143	FUND HOUSING BEFORE-1950 -O6	FAMILY-HOUSING - DWELLINGS & GARAGES
F	NNMC QTRS F SR. ENL QTRS	1632	1950	71132	FUND HOUSING 1950-THRU-1969 - O4&O5	FAMILY-HOUSING - DWELLINGS
G	NNMC QTRS G SR. ENL QTRS	1683	1950	71132	FUND HOUSING 1950-THRU-1969 - O4&O5	FAMILY-HOUSING - DWELLINGS
H	NNMC QTRS H SR. ENL QTRS	1785	1950	71132	FUND HOUSING 1950-THRU-1969 - O4&O5	FAMILY-HOUSING - DWELLINGS

codes are written to ensure safe designs under a maximum occupancy, a reduced percentage was used for an assumed realistic population. These were the assumed populations that were then factored into utility modeling and transportation requirements. Based on this approach, the highest concentration of people is in the medical core, buildings 1 through 10, which might have as many as 10,500 people using these facilities. The USUHS campus, the 70 series buildings, may have up to 5,100 students, staff and visitors. The AFFRI complex, known as the 40 series buildings, is estimated at 300 people. While it is recognized that normal day to day activities may be less than these numbers, this approach is reasonable for planning purposes and facility capacity for campus population distribution. The proposed additions and future growth were also factored into this population distribution approach to generate future occupancies and determine the impact on the campus. This approach is more than would typically be occupying the facilities on a given day, but is reasonable for considering the potential.

4.3.9 Building Assessments

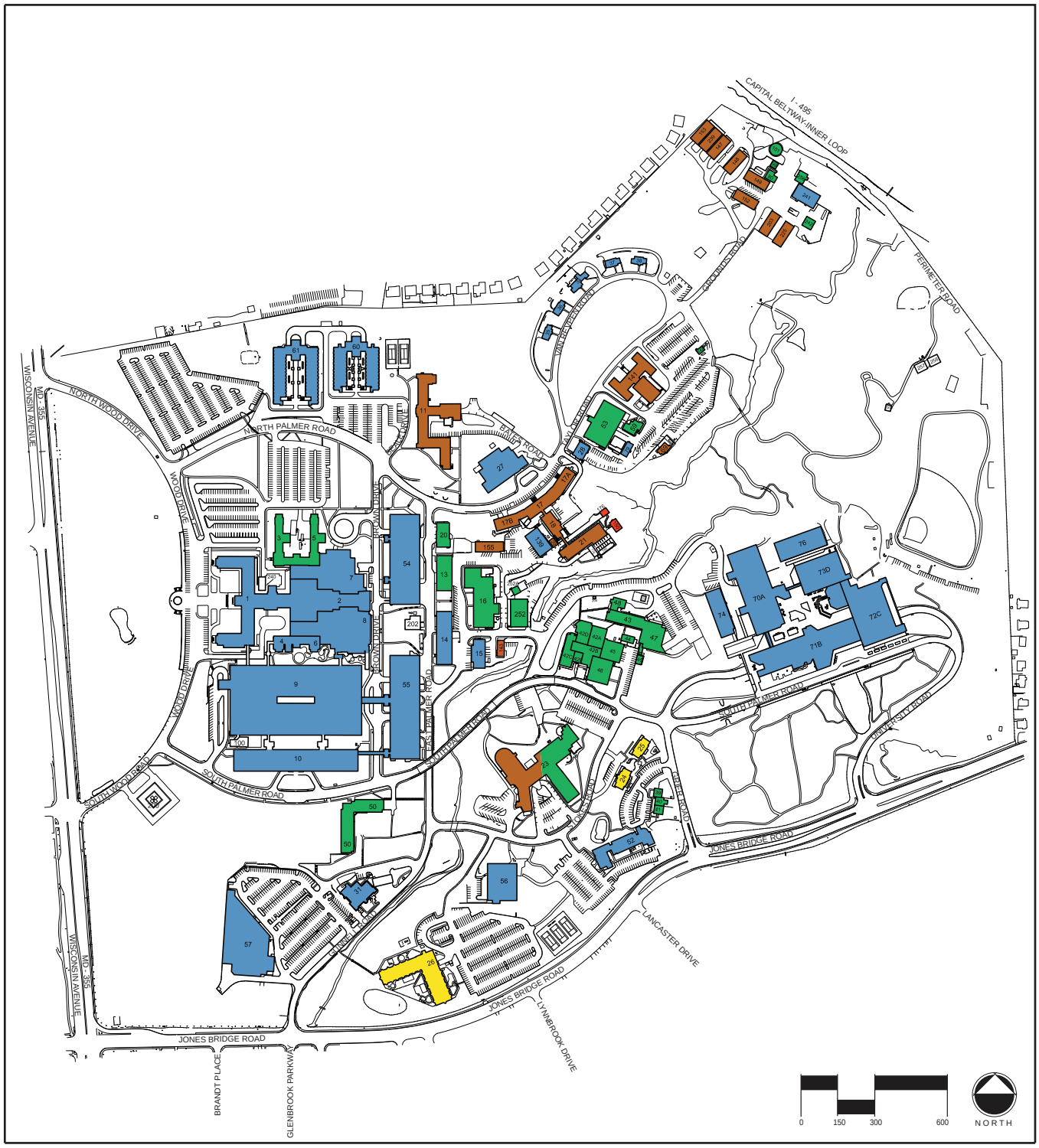
All of the buildings on campus were evaluated and given an overall assessment rating ranging from poor to excellent. (Figure 4-14 Existing Building Conditions) The evaluations were based on observation only and did not include destructive testing or detailed analysis. Apparent structural integrity, condition of finishes, condition of mechanical and electrical systems, obvious code issues, and accessibility, were considered in the evaluations. The full assessment with comments is provided as Appendix A.

4.4 Security

As a military installation, NNMC is potentially vulnerable to threats or terrorist activity. Several incidents within recent years have raised the importance of security and control on military and all federal installations. While many of these incidents have had dire consequences, the magnitude of the destruction on the World Trade Center and Pentagon on 11 September 2001, and the potential for future attacks have pushed the issue of security even higher.

Prior to these events, NNMC was open to public access. As a medical center, it was not considered a target in the same sense of a Naval installation dedicated to force protection. Several measures have been taken to improve the security and control of the campus in recent years. (Figure 4-15 Security and Control) A perimeter fence has been installed around the entire campus with controlled gates at various locations. The actual gate structures are still temporary, but there are current projects to provide new access control facilities to include improved queue and security barricades.

Figure 4-14 Existing Building Conditions



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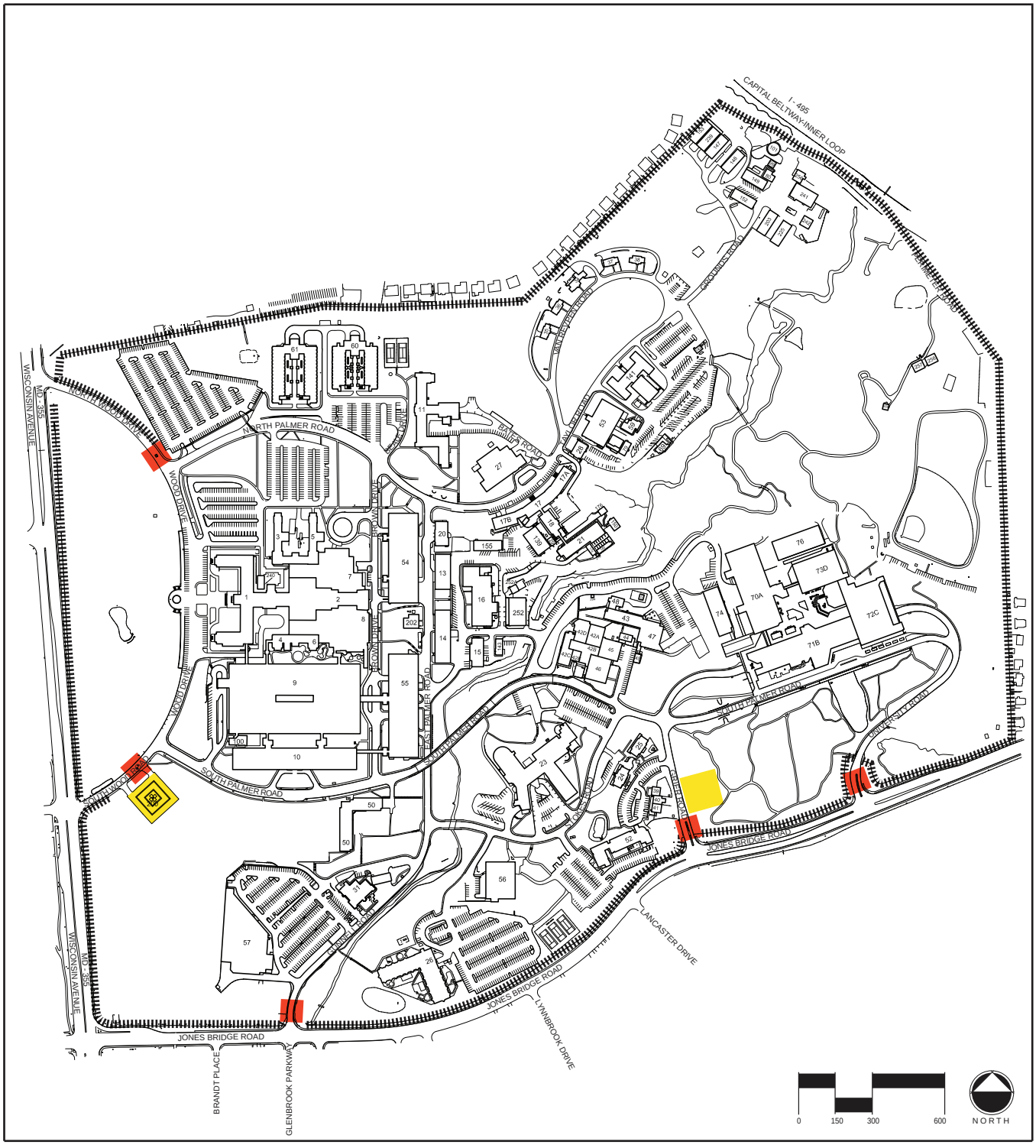
- EXCELLENT
- GOOD
- FAIR
- POOR
- UNACCEPTABLE

Figure 4-14

Existing Building Conditions



GUARD HOUSE
TRUCK SCREENING
PERIMETER FENCE

Figure 4-15

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Security and Control

These gates provide access for employees, patients and visitors to the campus arriving in vehicles, on foot, or by bicycle. Depending on the alert level determined by Homeland Security and the Department of Defense, procedures at the gates vary. For normal operations, the security personnel at the gate review identification before allowing anyone entrance to the campus. There is 100% identification check at all the gates, even for vehicles with military decals. Patients, civilian, and military employees are required to show military ID and vehicles are subject to search. Contractors or visitors can be cleared in advance, placed on an access list at the gate, and allowed to enter with proper ID. Depending on the situation, additional security procedures may be implemented. All of these procedures create a queue particularly during peak traffic hours. Operational procedures are in place to minimize these queues and the results on community roadways, but as traffic increases additional recommendations are made.

One of the issues of security is clearing delivery trucks and large commercial vehicles to enter the campus. These vehicles must undergo a thorough inspection that is often time consuming. Currently most commercial vehicles enter through the Navy Lodge gate during normal duty hours and through the South Gate after hours or weekends. This arrangement is marginally acceptable at this time, but will become a much larger issue and unacceptable with the anticipated level of construction anticipated. While sharing the new commercial vehicle inspection station recently constructed at the National Institutes of Health (NIH) directly across Rockville Pike, was considered, (it may be possible as a short term solution) it was determined that NNMC needed its own vehicle inspection area. The updated master plan identifies an area adjacent to the USUHS campus that would minimize impact to other traffic on campus and provide a vehicle inspection facility on NNMC.

Another major issue in terms of security is the existing built environment. The campus was built during a time when Homeland Security was not an issue and Antiterrorism/Force protection measures were not required. As a result, the majority of the existing facilities do not meet stand off distances, or separation goal for buildings, parking, and perimeters. The details of these requirements are established in UFC 4-010-01 Oct 2003 (rev Jan 2007), DoD Minimum Antiterrorism Standards for Buildings. (Figure 4-16 At / FP Setbacks) While this criteria recognizes it is impossible to correct all existing situations of non-compliance, new construction and renovations exceeding prescribed thresholds must meet the current criteria and renovations below the threshold should strive to meet criteria if economically possible. The requirements for new construction will be a significant issue for future development. Designs should incorporate appropriate functions and development opportunities in the standoff distances required for new construction.

Figure 4-16 AT/FP Setbacks

AT/FP BUILDING STANDOFF

148' AT/FP PERIMETER STANDOFF

Figure 4-16

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AT/FP Setbacks

4.5 Roadway Accessibility

The NNMC is situated just south of the Capital Beltway (I-495), in Bethesda, Montgomery County, Maryland. The western and southern boundaries of the center are formed by Rockville Pike (MD 355) and Jones Bridge Road, respectively.

The roadway network providing immediate regional and local access to the campus is illustrated in Figure 3-10. Figure 3-11 illustrates the roadways providing local access to the NNMC campus. The principal roadways providing direct access to the campus are described below:

4.5.1 Rockville Pike (MD 355)

This six-lane divided roadway is classified as a Major Highway by the County. It runs north-south along the western edge of the campus, connecting the site with Washington, DC to the south and the City of Frederick, Maryland to the north. This roadway also provides connections to other regional areas via an interchange with the I-270 / I-495 Freeway System situated just to the north, and intersections with major east-west arterials along other segments to the north and south of the campus. MD 355 is therefore a major regional and commuter route. It is also a main artery for several bus routes operated by the Washington Metropolitan Area Transit Authority (WMATA) and the Montgomery County Ride-On transit systems.

MD 355 provides direct access to the campus via two intersections/access points. The northern entrance (North Wood Road) is unsignalized. The southern entrance (South Wood Drive) is the eastern leg of the signalized MD 355/South Drive intersection. South Drive provides access to the National Institutes of Health complex and Washington Metropolitan Area Transit Authority's (WMATA's) Medical Center Metrorail Station. The current MSHA Traffic Trends Document (2005) indicates that MD 355 serves an average annual weekday traffic (AAWT) volume of 52,075 vehicle trips in the vicinity of the NNMC campus. The posted speed limit on Rockville Pike is 35 mph.

Rockville Pike is heavily traveled in the vicinity of the NNMC. Significant traffic congestion and delay occurs in the southbound direction during the morning peak period, with similar conditions occurring in the northbound during the afternoon peak period. This congestion is primarily due to commuter traffic associated with employment areas south of the campus, including Washington, DC and Bethesda-Chevy Chase.

4.5.2 Jones Bridge Road

This four-lane divided roadway is classified as an Arterial Road between Rockville Pike and Jones Mill Road by the County. It runs east-west along the southern edge of the NNMC campus, and intersects with Connecticut Avenue (MD 185) to the east. Jones Bridge Road provides directs access to NNMC via three entrances/intersections, i.e., at Gunnell Road, Grier Road and University Road. The roadway serves an AAWT volume of 20,860 vehicles along the campus. The posted speed limit is 40 mph.

Figure 3-10 also shows the Average Annual Daily Traffic volumes for the above noted roadway facilities.

4.6 NNMC Access and Circulation

The NNMC complex has five entrances / gates (Figure 4-17 Major Campus Entries). Two entrances are located along Rockville Pike and the others are located along Jones Bridge Road. The locations of these entrances were shown in Figure 3-10. Figure 4-18 Access and Circulation illustrates the existing campus roadway access and circulation system.

The two entrances off Rockville Pike are connected by an internal loop road (Wood Road). The northern entrance (North Gate) is located just south of Cedar Lane, and is aligned with the entrance to the NIH truck inspection facility. The North Gate is configured with three lanes. Two lanes serve inbound traffic while one lane serves outbound traffic. The entrance is closed from 7:00 pm to 5:00 am from Monday to Friday, and on weekends and holidays.

The southern entrance (South Gate) is the main entrance to the campus, and is located across Rockville Pike from the NIH South Drive entrance and the Medical Center Metrorail Station. This gate is open all the time, except when there is activity related to the use of the adjacent heliport facility. The entrance is configured with one inbound lane and two outbound lanes. The South Gate is also the main access point for pedestrian traffic, most of which is generated by the adjacent Medical Center Metrorail Station. The South Gate serves as the Commercial Vehicle inspection gate when the Navy Lodge/Grier Road gate is closed to inbound traffic or closed altogether.

The three entrances along Jones Bridge Road are located at Gunnell Road (Navy Exchange / NEX Gate), Grier Road (Navy Lodge Gate) and University Road (USUHS Gate). The Gunnell Road/Navy Exchange Gate is open to two-way traffic, from 5:00 am to 7:00 pm from Monday to Friday, and is closed at all other times including weekends and holidays. One travel lane is provided in each direction along Gunnell Road. The Grier Road/Navy Lodge Gate has a divided roadway cross-section, providing one inbound lane and two outbound lanes. All commercial vehicles are inspected at this gate. The gate operates between 5:00 am and 6:00 pm from Monday to Friday, and is closed at all other times. Only inbound truck traffic is served from 5:00 am and 3:00 pm. Between 3:00 pm to 6:00 pm, the gate serves only outbound traffic. The University Road/USUHS Gate is open to one lane inbound traffic between 5:00 am to 8:30 am from Monday to Friday, and is closed during other times.

Vehicular turning movement counts, counted at the gates as part of this study, were used to determine the trip generation characteristics of the center. Figure 4-18 shows that of all the vehicles entering into the campus during AM peak hour, 59% use gates along Rockville Pike and 41% use gates along Jones Bridge Road. During the PM peak hour, 45% of the total exiting vehicles use gates along Rockville Pike and 55% use gates along

PRIMARY CAMPUS ENTRY
(24 HOUR ACCESS)

SECONDARY CAMPUS ENTRY
(LIMITED ACCESS)

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Figure 4-17

Major Campus Entries

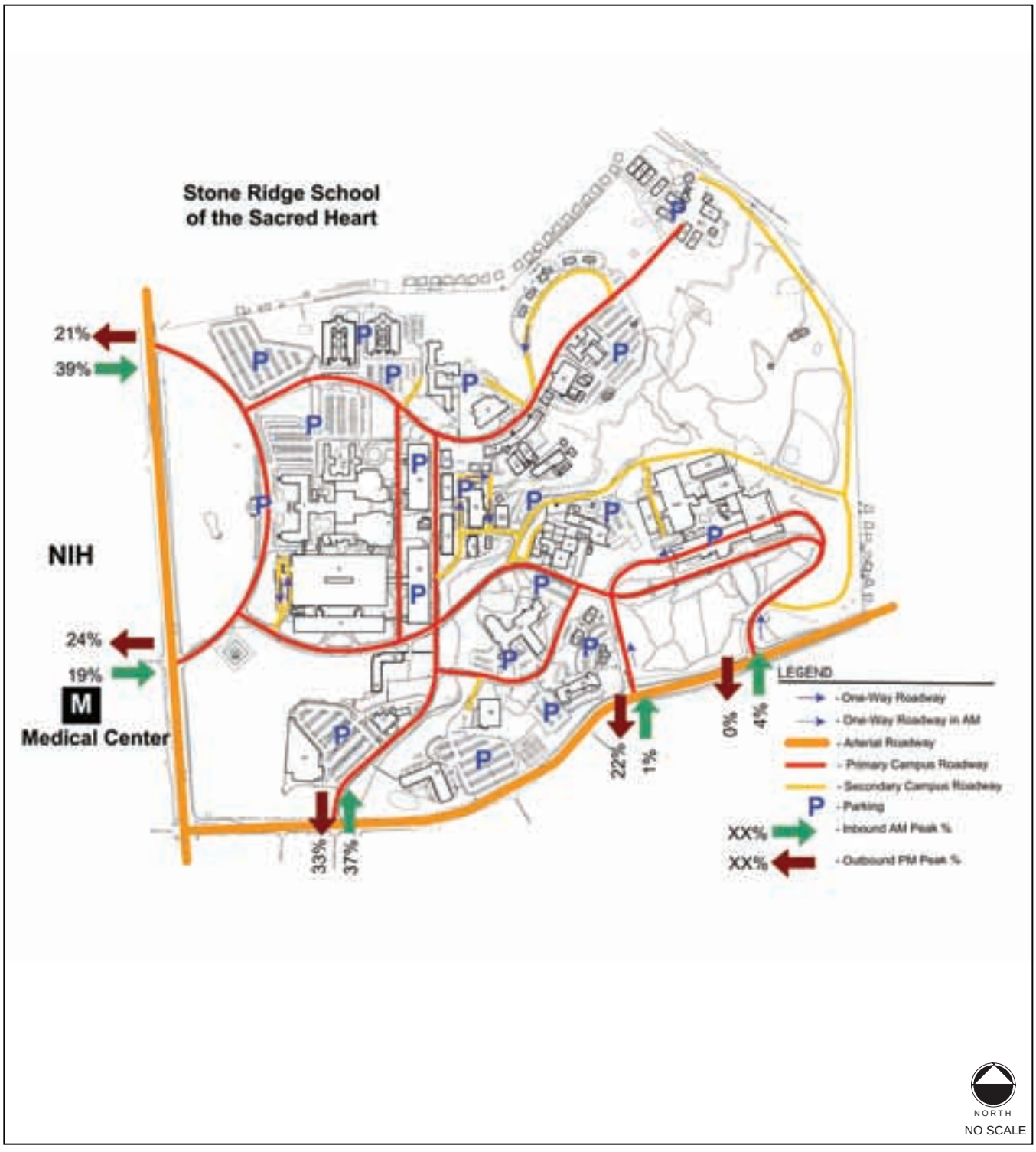

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Figure 4-18

Access & Circulation

Jones Bridge Road. The AM and PM peak hours of NNMC vehicular traffic were determined to be 6:30 - 7:30 am and 4:00 - 5:00 pm, respectively. The general AM and PM peak hours of the adjacent ambient traffic were determined to be between 7:45 - 8:45 am and 4:30 - 5:30 pm, respectively. This shows that the peak hours of NNMC and ambient traffic do not coincide with each other in the morning and coincide partially in the evening.

4.6.1 Intersection Capacity Analysis

To assess the existing traffic situation along the external perimeter roadway and within the campus, the following intersections were analyzed. These intersections are shown in (Figures 4-19 Existing AM Peak LOS Results and 4-20 Existing PM Peak LOS Results)

External Locations:

Rockville Pike (MD 355) and Cedar Lane

Rockville Pike (MD 355) and North Drive

Rockville Pike (MD 355) and Northwood Road

Rockville Pike (MD 355) and Wilson Drive

Rockville Pike (MD 355) and South Drive

Rockville Pike (MD 355) and Jones Bridge Road

Jones Bridge Road and Gunnell Road

Jones Bridge Road and Grier Road

Jones Bridge Road and University Road

Internal Locations:

North Palmer Road and Wood Road

South Palmer Road and Wood Road

North Palmer Road and Robert Brown Drive

North Palmer Road and East Palmer Road

South Palmer Road and Robert Brown Drive

South Palmer Road/Gunnell Road and Stokes Road

South Palmer Road and Grier Road

The Critical Lane Volume (CLV) capacity analysis method was used to analyze the external study intersections, and the Highway Capacity Software (HCS) methodology was used to analyze the internal study intersections. The Level of Service (LOS) results of the capacity analyses are shown in Figures 4-19 and 4-20 for the AM and PM peak hours, respectively.

Level of Service qualitative measure describing operational conditions within a traffic stream or at an intersection, and reflects their perception by drivers and other roadway users. Principal considerations are factors

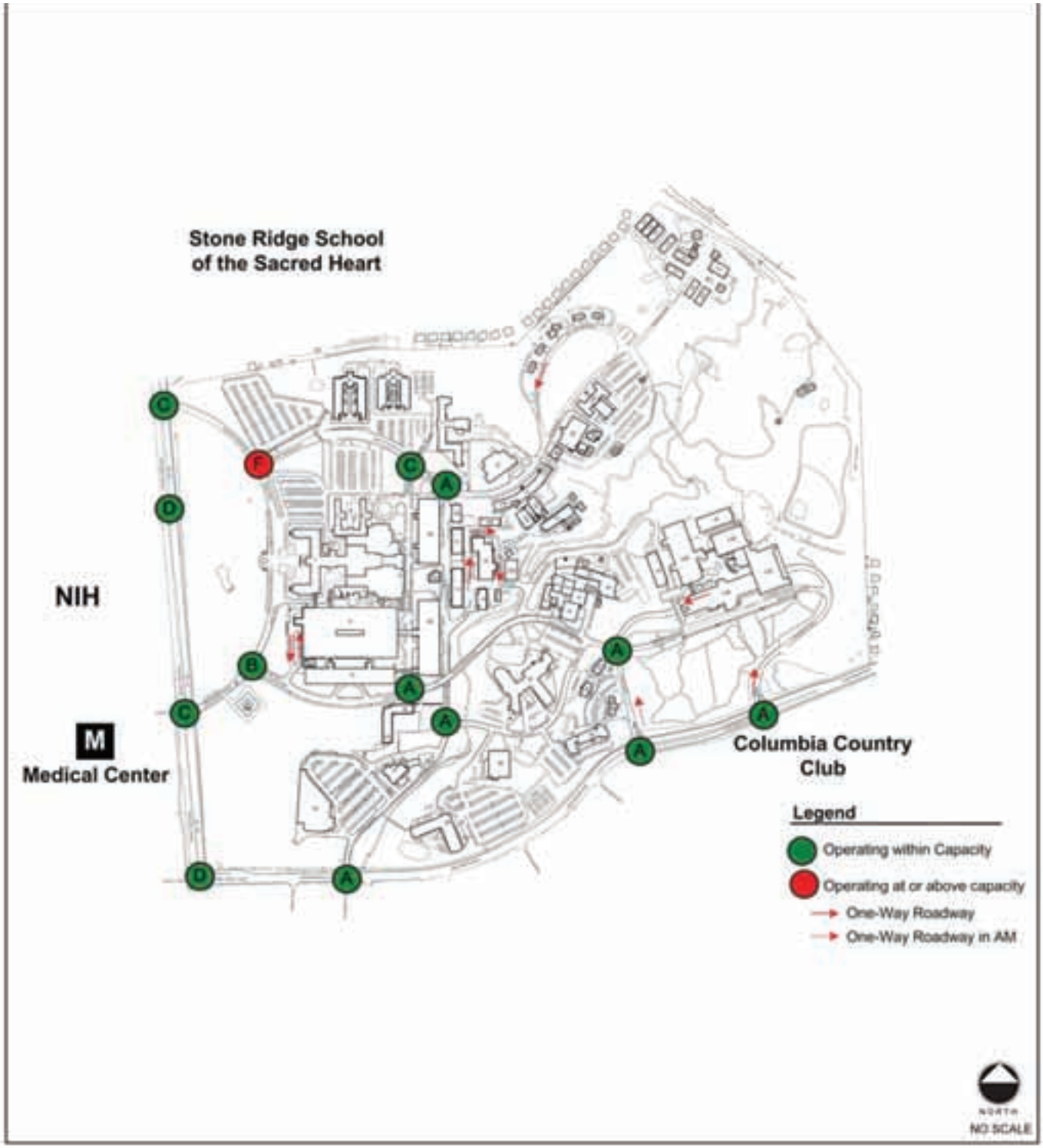

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Figure 4-19

AM Peak LOS

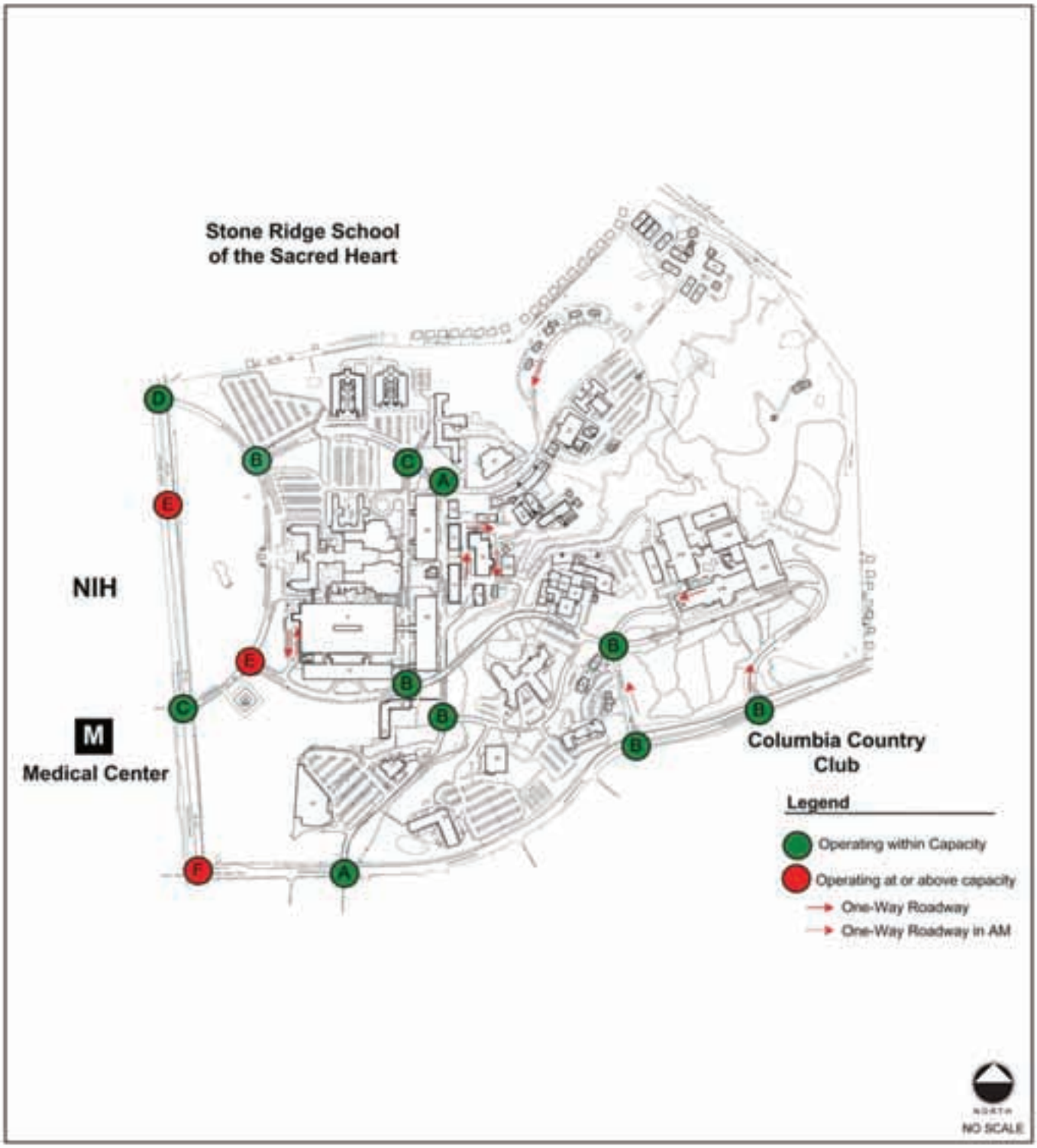

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Figure 4-20

PM Peak LOS

such as speed and travel time, delay and freedom of maneuver, traffic interruptions, comfort, convenience and safety. A brief description of each level of service is provided below:

LOS A: Traffic is moving under free-flow conditions, and speeds are generally sustained at or near the posted speed limit. Drivers are able to change lanes easily.

LOS B: Traffic speeds are slightly lower than those for LOS A. There may be some restriction on the ability of drivers to make lane changes or to leave or enter the traffic stream, although drivers do not find it difficult to make such maneuvers.

LOS C: Drivers become noticeably affected by interactions with other vehicles. Speeds decline slightly and the freedom to maneuver for individual vehicles may be significantly limited. Traffic flow is still stable but turning and slow moving traffic tends to create some congestion. Small increases in traffic flow beyond this condition result in the development of operational problems

LOS D: Speeds are at or slightly under the posted speed, but freedom to maneuver is noticeably restricted. Turning vehicles cause slowdowns to the rest of the traffic stream. Vehicles will wait an average of 30 to 60 seconds at each signalized intersection. On the side streets of unsignalized intersections, drivers will have waits of about 25 to 35 seconds but typically will encounter another vehicle ahead of them before they can leave or enter the side street.

LOS E: Operating conditions are at or above capacity and are at the upper limit of what typical drivers will tolerate. Traffic operations may be under breakdown conditions (nearing stop-and-go) and a uniform moving flow cannot be maintained. There are few if any gaps in the traffic flow to enable side traffic to enter. Maneuvering within the traffic stream is extremely difficult and is generally only accomplished by forcing other vehicles to give way.

LOS F: At this level of service, traffic demand is greater than the roadway capacity, resulting in heavily congested flows. Average speeds in this level of service range are at least 10 to 15 mph below the posted speed limit, and frequently may become stop-and-go conditions. Operating conditions become unstable and difficult to predict. Vehicles wait through two or more signal cycles before making it through an intersection. Vehicles on unsignalized side streets will have waits of two or more minutes to get into the traffic stream of the major street. These conditions often result in cut-through traffic on available adjacent neighborhood streets to avoid extreme.

4.6.2 Truck Access and Circulation Patterns

Truck deliveries to NNMC involve primarily mail trucks (UPS, US Postal Service), 18 wheeler trucks (Beverages, Supplies), box trucks (Bread,

Medical Supplies), fuel trucks (Gasoline, Heating oil) and construction vehicles (dump trucks). NNMC receives an average of 84 commercial vehicles per day and 44% of these vehicles arrive between 10:00 am to 2:00 pm. Figure 4-21 Existing Public Entries and Service Entries and Figure 4-22 Average Daily Truck Deliveries graphically illustrates the average daily truck deliveries.

All commercial vehicles are required to enter the campus via the Grier Road/ Navy Lodge Gate. It provides a single inbound lane for truck ingress and inspection only between 5:00 am and 6:00 pm, and two lanes for outbound passenger vehicle traffic from 3:00 – 6:00 pm, from Monday to Friday. The inbound lane does not provide sufficient storage to enable efficient inspection and vehicle throughput, and no turn-around facility is provided for rejected trucks. All gates are used by trucks leaving the campus.

The main loading dock destinations within the campus are located at Buildings 54 / 55. Figure 4-23 Existing Loading Docks and Delivery Routes shows the loading dock locations and the associated truck routes.

The roadways surrounding NNMC campus are also major truck routes. G/SA collected volume classification counts from State Highway Administration (SHA) traffic count library and conducted its own automatic traffic recorder counts in June of 2007. The truck percentages on the roadways surrounding NNMC campus are shown in Table 4.6.2. The data shows that trucks constitute a significant proportion of the peak hour traffic on the adjacent roadways.

Table 4.6.2 Truck Traffic Percentage – Adjacent Roadways

Source:
* State Highway Administration (SHA) Traffic Count Data, Year 2006

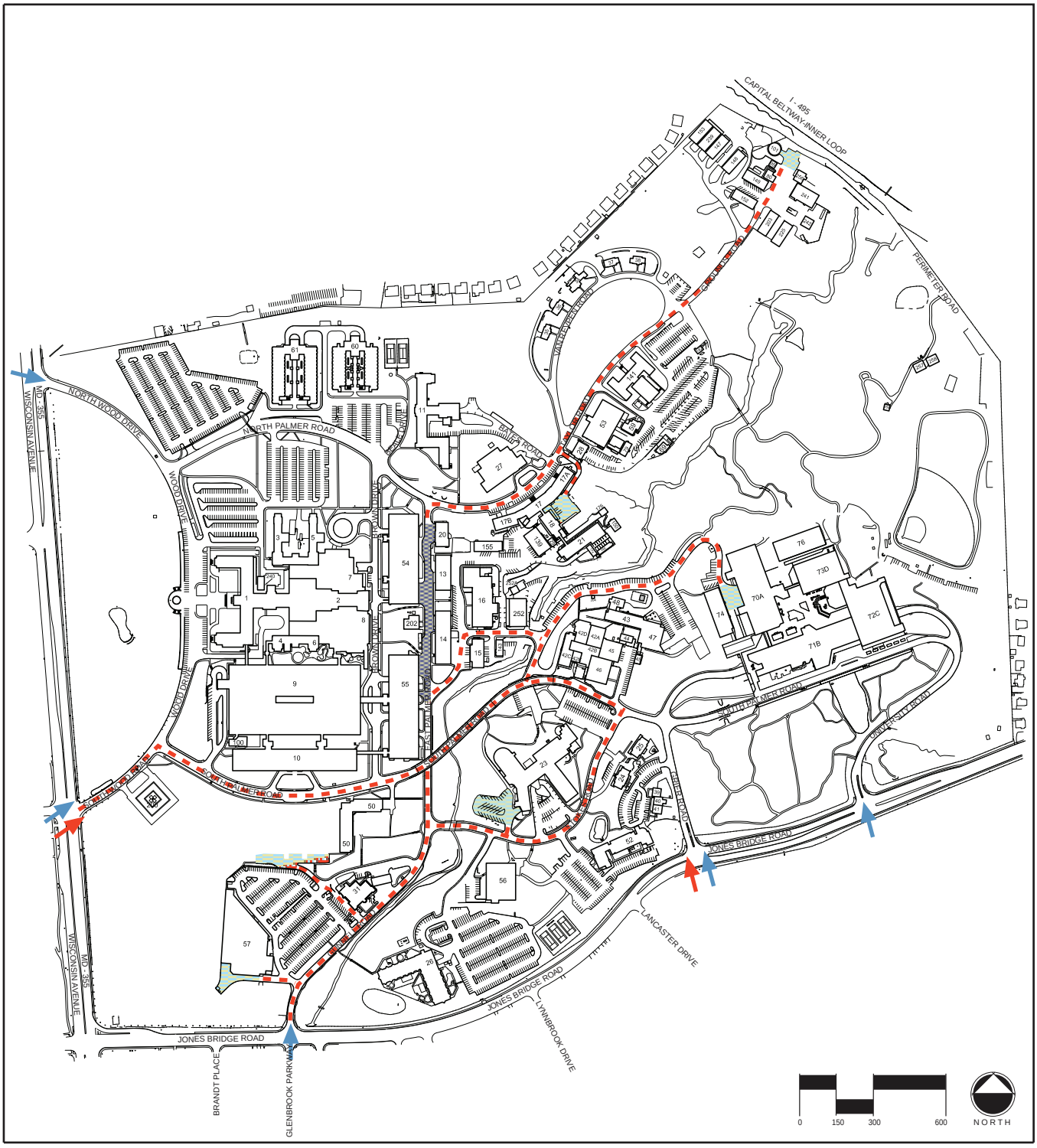
Location	AM Peak Hour	PM Peak Hour
Rockville Pike NB (0.1 miles north of Jones Bridge Road)*	18.80%	11.60%
Rockville Pike SB (0.1 miles north of Jones Bridge Road)*	15.30%	12.80%
Rockville Pike NB (0.1 miles north of I – 495)*	12.50%	9.50%
Rockville Pike SB (0.1 miles north of I – 495)*	11.80%	8.70%
Jones Bridge Road EB (bet. Gunnell and Grier Road)**	24.40%	24.40%
Jones Bridge Road WB (bet. Gunnell and Grier Road)**	20.90%	18.40%
I – 495 EB (0.2 miles east of MD 355)*	20.50%	16.70%
I – 495 EB (0.2 miles east of MD 355)*	20.70%	22.80%

** G/SA ATR Data, June, 2007.

4.6.3 Public Transportation

The NNMC is served by public transportation facilities as shown in Figure 4-24 Existing Transit Facilities Serving the NNMC campus. The campus

Figure 4-21 Existing Public Entries & Service Entries



PUBLIC ENTRY
SERVICE ENTRY
SERVICE ACCESS
SERVICE AREA

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Figure 4-21

Existing Public Entries & Service Entries

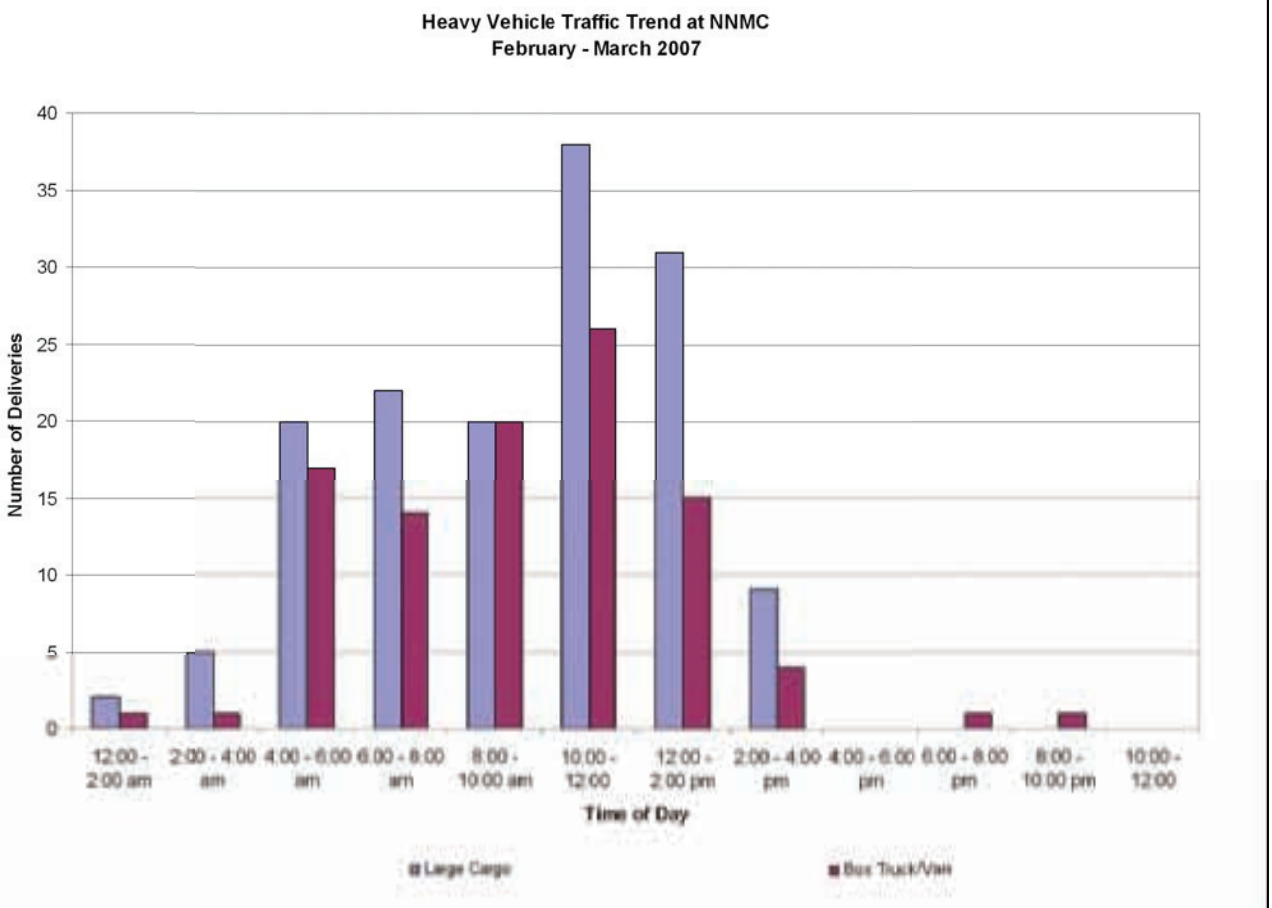

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Figure 4-22

Average Daily Truck Deliveries