Chapter Six
Development Guidelines

6.1 Introduction

Development guidelines are included in this Master Plan 2003 Update to quantify or further define the general concepts and planning intentions set forth in Chapter 5. Although there is flexibility within the Master Plan, certain key relationships, patterns, and standards should be adhered to or considered when developing site or building projects to ensure that the desired functional characteristics and campus character are achieved. The Development Guidelines define these key elements and provide recommendations for their implementation.

Subjects addressed in this chapter include issues of building size and scale, definition of open spaces, site character and quality, as well as access and circulation. Phased implementation is recommended in this chapter as a logical sequence of construction and demolition, providing a means to efficient and effective use of the site. Phasing will be subject to actual program needs and available funding.

These Guidelines supplement the NIH Design Policy and Guidelines, which include NIH Physical Security Design Guidelines.

6.2 Building and Siting Guidelines

6.2.1 Setbacks and Build-to-Lines

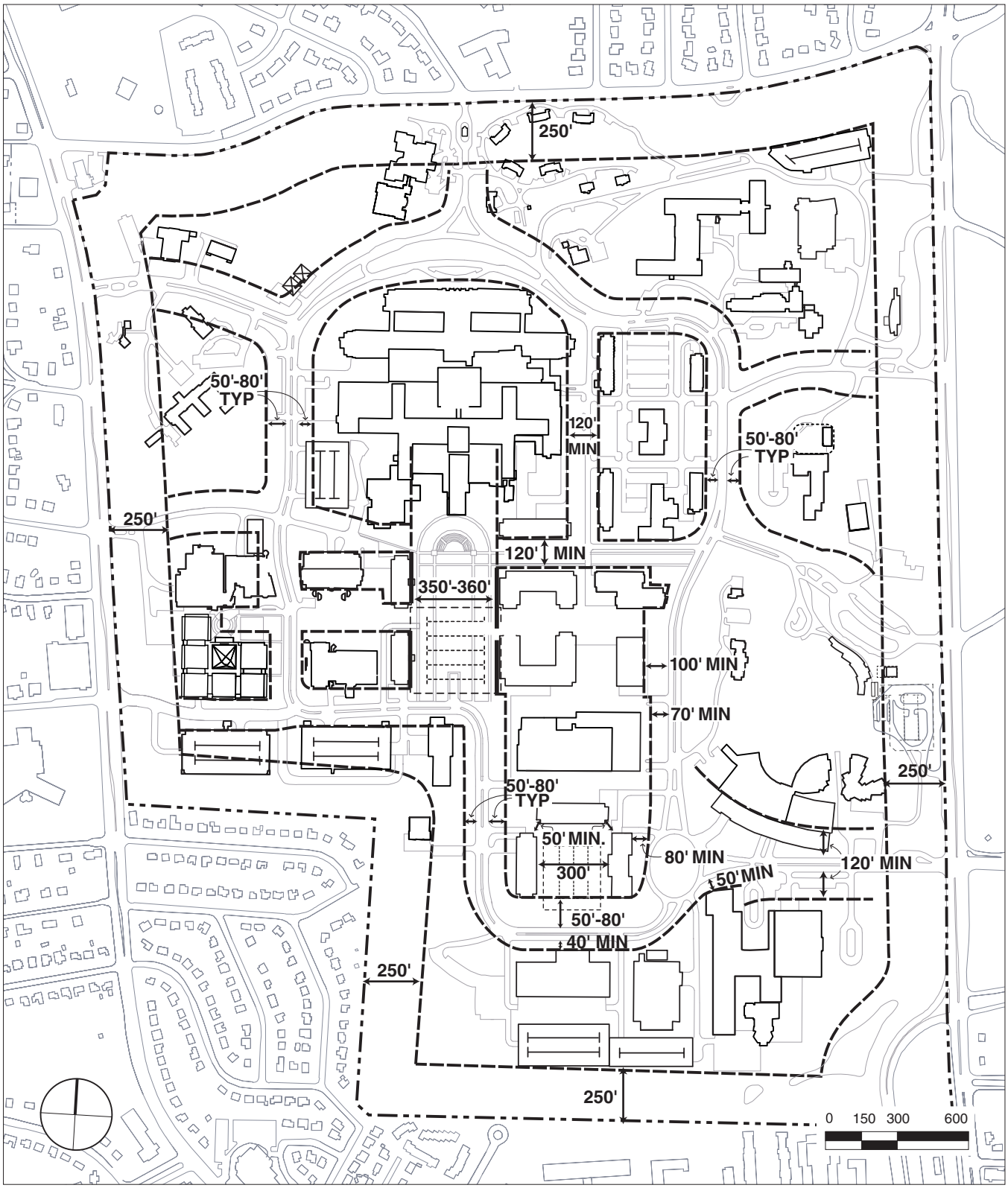
Major Building Setbacks

On a campus-wide basis, the Master Plan proposes general patterns of setbacks for buildings from major roadways to control density, ameliorate the scale of buildings, and ensure the development of a “campus” character to the site. Along internal roadways, buildings should generally not be any closer than 50 to 80 feet from roadway curb lines. Where exceptionally large buildings occur, or at prominent campus addresses such as the Center Drive/Rockville Pike entrance and the area in front of the Clinical Center Complex, building setbacks should be in the 80 to 150 feet range. In order to maintain a clear relationship between building entries and roadways, it is recommended that no new structures be set back more than 180 feet from their principal roadway. See Figure 6.2.1.

At the perimeter of the site, the buffer zone setbacks should be acknowledged by excluding new buildings and surface parking within this area. The buffer should be maintained at 250 feet throughout the entire campus perimeter. See Section 5.2.4 for more detailed discussion of buffer zone characteristics.

Within the campus there are two proposed major open spaces, which have critical minimum dimensions. The first space is the Central Mall, which has a minimum width dimension of 350 to 380 feet. This width corresponds to the distance between the C and G wings of the existing Clinical Center. The second major space to be defined is the South Quad, which has a minimum width dimension of 300 feet by 300 feet to ensure an appropriate proportion to the space.

In general, enclosed open spaces are perceived to be comfortable in scale if the proportion of the width of the open space to the height of surrounding structure is between 2.5:1 and 3.5:1. Spaces, which have a proportion greater than 2:1 create an “urban” feel, and require significant, shadow considerations. To fall within these proportional guidelines, the buildings, which will form the “walls” of the Central Mall, should be a minimum of 100 feet and a maximum of 160 feet high. Building faces along the east and west sides of the Central Mall should align to create uniformity to the enclosure, edge treatment, and width of the space.



SETBACK LINE

BUILD-TO LINE

Figure 6.2.1

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Major Building Setbacks

To avoid the perception of the Central Mall as being too narrow and long, the desired proportion of the width to length of the mall is recommended at between 1:2 and 1:3. With a recommended width of between 350 and 380 feet and a total length of approximately 1200 feet, the proposed width to length proportion is about 1:3. From the south end of the mall to the amphitheater and trees on the north, the proportion is approximately 1:2. The length of the Central Mall is also based on the need to connect the north and south portions of the site, a distance of approximately 2,600 feet from the loop road on the north to the loop road on the south.

The scale and integrity of buildings within the Historic Core (Buildings 1 through 5) should be protected. A minimum setback of 120 feet to the nearest buildings on the west and south sides is recommended.

6.2.2 Building Heights

General Campus Height Plan

Proposed building heights follow the Master Plan building height concept of placing the highest buildings near the center of campus and transitioning to low buildings at the perimeter. Transitions in building heights are also made near the structures of the Historic Core. Figure. 6.2.2-a indicates the recommended maximum heights of new construction on campus. This height limit includes all occupiable floors (excluding interstitial floors and mechanical penthouses), and should be measured from the average grade at the perimeter of the structure. Figure 6.2.2-a is intended as a general campus-wide guideline. Within this overall building height framework there are particular areas, which require special consideration upon implementation of nearby construction. These areas are listed later in this section under Critical Areas.

An important concept in the development of height limitations at the perimeter of the site is the imposition of an allowable height envelope corresponding to a 1:5 height to distance ratio, extending approximately 750 feet into the NIH campus on the north, west and south sides. This ratio limits the height of any proposed new structure to one foot for every five feet of distance measured perpendicularly from the property line of parcels adjacent to the NIH campus, except along Rockville Pike where building height concerns are lessened. There are four primary reasons for using the 1:5 height ratio:

- In relation to the discussion of spatial definition in Section 6.2.1, generally accepted urban design guidelines indicate that areas, which have a height to distance ratio greater than 1:4, do not feel enclosed. Therefore, a 1:5 ratio will provide an even greater sense of openness at the perimeter of the site.
- A person's primary cone of vision is about 30 degrees above the horizon. Objects which fall within this visual zone block the observer's view of the sky, thus giving a greater or lesser sense of enclosure depending on the amount of the sky-plane which is blocked. The 1:5 height ratio corresponds to approximately 11.5 degrees, so that an object within this height envelope would obstruct less than half of the viewer's sky-plane.
- A 1:5 ratio is typical of surrounding residential neighborhoods. In surrounding areas, houses tend to be 2 stories tall (“20 feet) and about 100 feet apart at rear yards.
- Almost all of the current buildings on the NIH campus fall within the 1:5 height to distance ratio.

The recommended building heights were determined from three-dimensional massing studies of the relationships between proposed and existing structures on campus, and to fall within the 1:5 height envelope at the perimeter of the campus. Heights have been arranged to create a coherent pattern among all campus buildings and to give a sense of hierarchy or prominence to the most important ones. In general, the tallest buildings are located on the Central Mall. The building heights shown also accommodate

building construction sufficient for the attainment of the proposed Master Plan development program as described in Section 5.1.3.

Critical Areas

The Master Plan minimizes the effects of new construction on neighboring areas off campus. Within the campus, special attention has been given to creating appropriately scaled open spaces and relationships between new and existing buildings. Areas of significant attention to scale issues include: development adjacent to the Convent Building 60; development near the Historic Core quad; the Central Mall; the potential development parcels near the Metro station; and the areas adjacent to the south perimeter of the campus which directly abut residential neighborhoods. Figures 6.2.2-c, and 6.2.2-d illustrate in section form the Master Plan intentions for building envelopes in these sensitive areas. Sectional drawings indicate the desired target heights of buildings as used to calculate the target square footage areas listed in Table 5.2.3-a.

6.2.3 Ground Level Activity and Use

In all areas of the campus it is desired that buildings present an accessible appearance at ground level. Building entries should be designed to address streets or major spaces. Blank walls without fenestration should be avoided.

In particular, ground level activities and uses are encouraged around the Central Mall. This area should become the central meeting place of the campus. Numerous building entries and ground level activities, which open out into the mall, will aid in creating this sense of vitality and centrality.

Pedestrian movement can also add to the vitality of public spaces on campus. Spaces should be designed to accommodate and encourage pedestrians comfortably. Walkways within the major open spaces should be of high quality materials, shaded, and equipped with seating and furnishings where appropriate. Buildings around the major open spaces may also include arcades to encourage pedestrian movement in inclement weather.

6.2.4 Density and Bulk

Maintaining a “campus” character and image for the site is an important aspect of the Master Plan. To ensure that an appropriate proportion of open space and landscape is maintained, it is important to control the density of buildings on campus. Generally, development should be denser at the core of the campus than at the periphery. However, filling in of open spaces shown in the Master Plan by additional construction is discouraged as this may diminish the character and quality of the open spaces, as well as impede views and light available to other buildings.

Building bulk in future development should also be limited. The Master Plan concept creates quads or groups of buildings made up of individual building modules, which can be implemented incrementally over time. Where possible, building modules should be limited to footprints of 40,000 gsf or less, with no dimension greater than 300 feet in any direction. Long buildings creating the appearance of a wall should be avoided, especially near the perimeter of the site.

6.2.5 Rooftop Elements

Rooftop elements such as parapets, penthouses, exhaust stacks and antennas should be carefully designed to ensure architectural compatibility and to minimize their

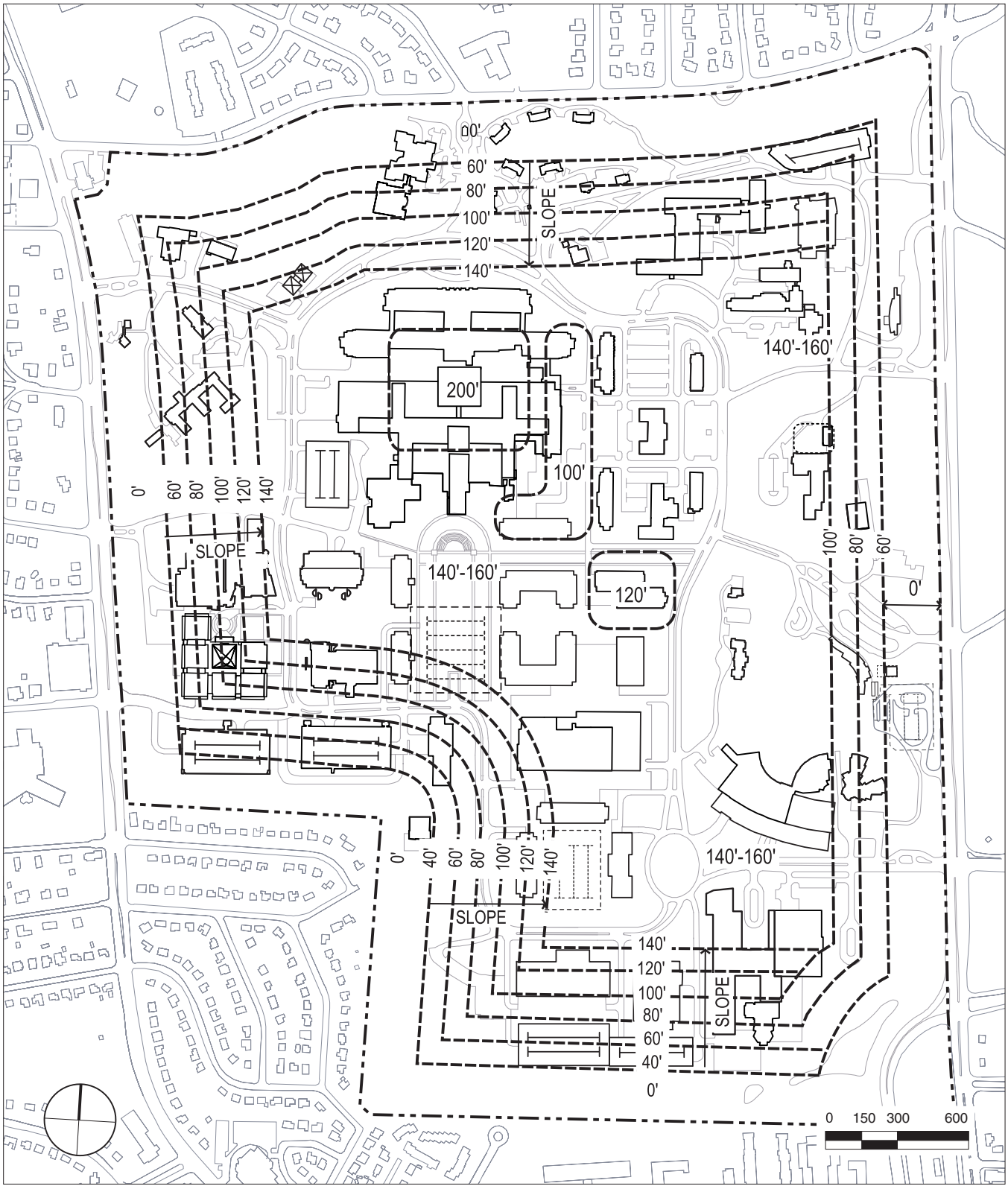

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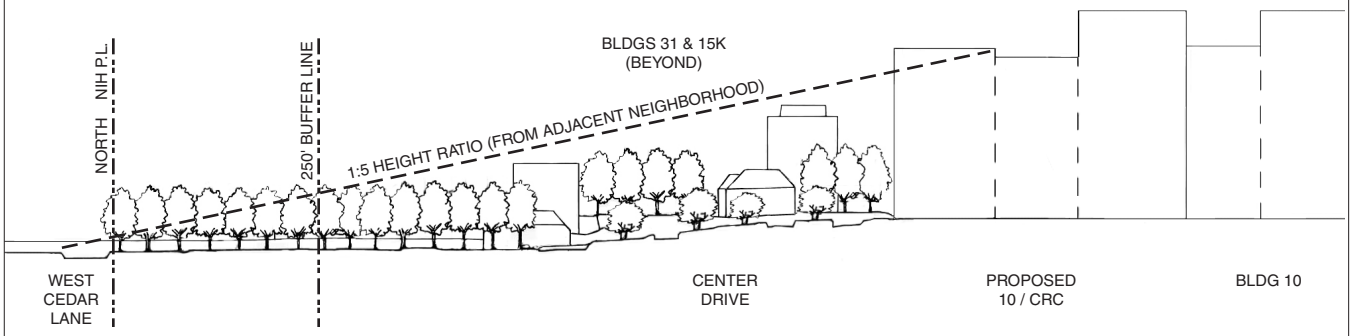
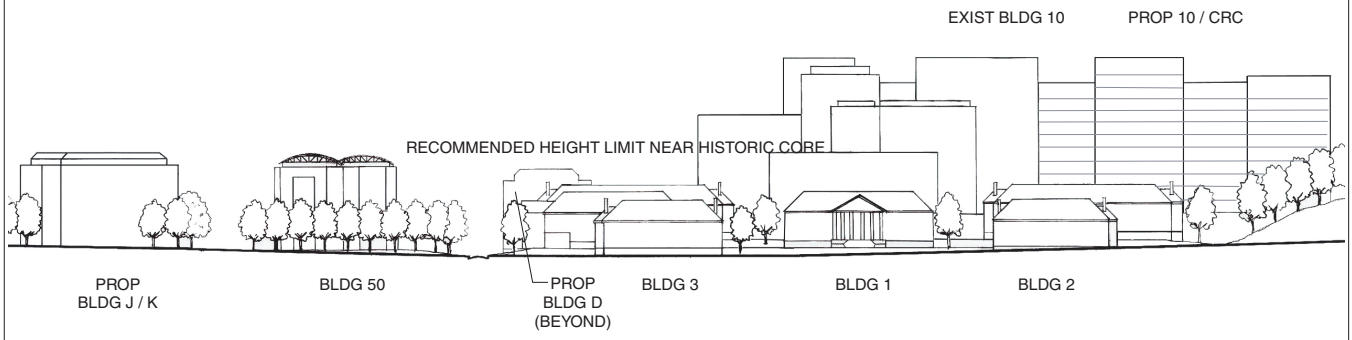
Figure 6.2.2-a

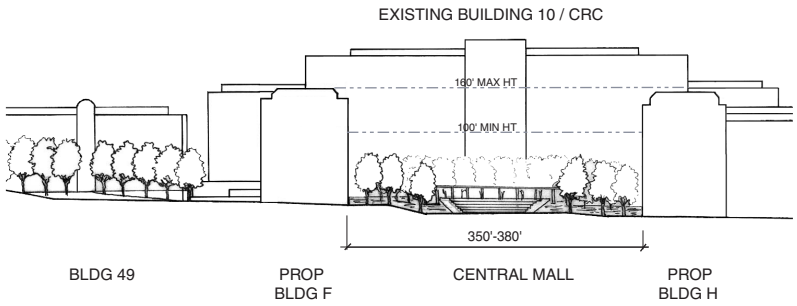
Recommended Maximum Building Heights



1 Recommended Building Envelopes for North Campus Area - View Toward East



2 Recommended Building Envelopes near Historic Core - View Toward West



3 Recommended Building Envelopes at Central Mall - View Toward North

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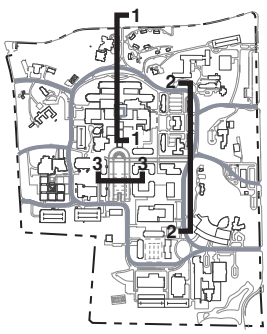
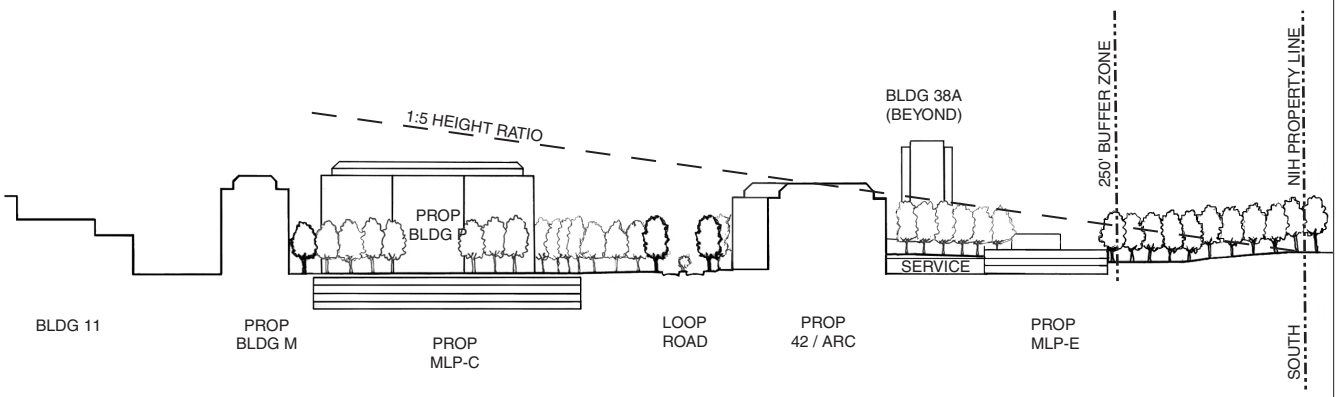
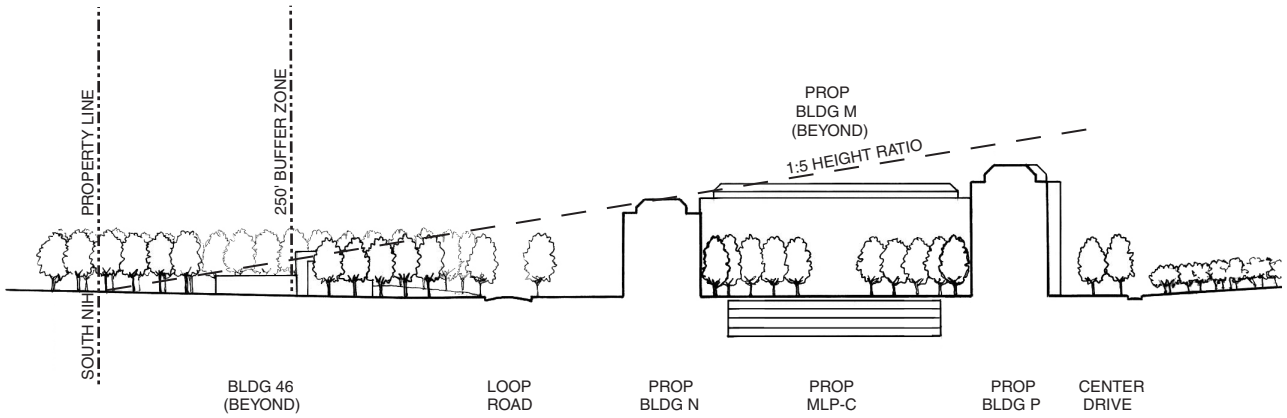


Figure 6.2.2-b

Building Envelopes Critical Areas



1 Recommended Building Envelopes for South Quad from South Property Line - View Toward East



2 Recommended Building Envelopes for South Quad from Southwest Property Line - View Toward North

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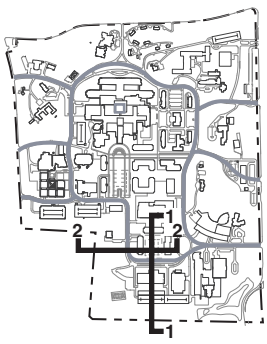

Figure 6.2.2-c

Building Envelopes Critical Areas

visual impact on the skyline. Mechanical and elevator penthouses should create visually attractive roofscapes and rooflines for the NIH campus. These elements should be integrated into the architectural expression of the building, and can be articulated as an attic story or hidden within the roof form of the structure. All rooftop equipment should be screened from view using materials consistent with the major building facades.

Installation of rooftop antennas, including satellite and microwave dishes, should be carefully considered for location and visual impact. Antennas should be installed at the lowest possible elevation above the roofline, and screened to the extent practicable from public view. Antennas should be set back as far as possible from all edges of the roof (20 feet at a minimum). Rooftop antennas, which cannot be screened, should be placed in association with penthouse structures so as to avoid the appearance of a freestanding object on the roof. Antenna and mounting materials should be unobtrusive and of a color that blends with surrounding buildings. Antennas should be protected against corrosion, securely mounted, and adequately grounded to protect against lightning strike.

6.3 Historical and Archeological Guidelines

6.3.1 Historical Guidelines

As discussed in Section 4.6.1, to date NIH and the Maryland Historical Trust (MHT) have agreed that the following sites meet the criteria for listing in the National Register of Historic Places:

- The Historic Core
  - Building 1 — Administration Building
  - Building 2 — Office/Administration
  - Building 3 — Office/Administration
  - Building 4 — Research
  - Building 5 — Research
  - Building 6 — Research
- Building 7 — Research
- Buildings 15B1-15G2, 15H, and #15I — The Officers' Quarters
- Building 15K — Wilson House (Tree Tops)
- Building 16/16A — George Freeland Peter Estate (Stone House and Caretaker's Residence)
- Building 38 — National Library of Medicine
- Building 60 — Convent Building

Buildings that have been evaluated and do not meet the criteria for listing in the National Register of Historic Places include:

- Building 8 — Research
- Building 9 — Research
- Building 10 — Clinical Center
- Building 61 — Caretaker's Cottage (Convent)

It is possible that other resources not yet evaluated may also meet the criteria for listing in the National Register of Historic Places, or that other buildings, upon reaching 50 years of age, will be eligible for listing. (Under Section 110 of the National Historic Preservation Act, federal agencies are required to identify and evaluate historic resources and to ensure that the resources are managed and maintained in a manner that is sensitive to their historic, archaeological, architectural, and cultural values.) NIH is committed to working with the Maryland Historical Trust (the State Historic

Preservation Office) to evaluate the potential historic significance of buildings that are approaching 50 years of age. Until these evaluations are complete, NIH acknowledges that cultural resource investigations will be necessary for individual undertakings to be submitted under Section 106 review. (Under Section 106 of the National Historic Preservation Act, government agencies are required to take into account the effects of planned undertakings on historic resources prior to approving funding for the undertaking.) NIH will continue consultation with the Maryland Historical Trust on these and other issues.

Although a Programmatic Agreement and Historic Resources Management Plan are goals to be considered for the future, it is not possible at this time to fund or implement these documents.

In this regard, the Secretary of the Interior's Standards for Rehabilitation provide basic principles to guide work undertaken on historic buildings. The Standards are as follows:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of distinctive features, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that can cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

6.3.2 Archeological Guidelines

Implementation of the NIH Master Plan will necessitate new construction and site improvement, hence ground disturbance. It must be assumed that any archeological resources present at the specific site would be adversely affected by these construction

activities. Figure 4.6 shows the few remaining sites with archeological potential based on the undisturbed nature of the areas. These are identified as archeologically sensitive areas. Future construction in these areas will require Phase I cultural surveys prior to design and construction to satisfy Section 106 of the National Historic Preservation Act criteria for determining archeological significance and potential eligibility for the National Register. If Phase I surveys indicate that the areas contain materials of potential significance, then a Phase II survey will be completed. The scope of the Phase I survey is dictated by public law, which assures that appropriate levels of survey evaluation and mitigation are pursued. The National Historic Preservation Act of 1966, as amended in 1980, directs the Secretary of the Interior to promulgate guidelines for Federal agency responsibilities under Section 110 of the same Act. The *Maryland Historical Trust Archeological Standards and Guidelines* will be followed to complete these requirements.

In the master planning process, efforts were made to avoid or minimize intrusion into archeologically sensitive areas. However, if a sensitive area will potentially be impacted, the site will be evaluated and recommendations for appropriate sampling, recovery of artifacts, or protection in place will be prepared as necessary. It is possible, but not probable, that an alternative building site would have to be chosen or construction delayed if the archeological site were determined to be of great importance. In general, artifact recovery is preferable to avoidance since the historic and archeological value of most sites lies in the information obtainable from the artifacts.

The survey, evaluation and mitigation work (if required) should be completed during the planning of individual building projects and prior to the start of any construction. This releases the site for construction and avoids delays and additional costs once construction is underway.

6.4 Circulation Guidelines

6.4.1 Vehicular

Although no new overall campus peak hour trips will be generated by future NIH growth beyond the trip generation goal defined for the Transportation Management Plan in the 1992 "Memorandum of Understanding", traffic volumes will increase at some intersections due to the increase of employment and the increase and redistribution of parking within the campus.

The locations of roadway types on campus are presented in Figure 6.4.1-a. In general, lanes are recommended to be eleven feet wide at primary site entries, with the exception of the Lincoln Drive exit where the recommended lane widths are to be ten feet. The loop road is recommended to consist of three different cross section widths; Section B, Section D, and Section E (see below). Lane widths are recommended to be ten feet wide in most other areas. The number of lanes along the loop road was determined based on the peak hour link volumes, the desire to provide for bicycle circulation throughout campus, and the presence of intersecting driveways. Entrance roadways should be median divided, except in sections of the northern part of campus where the existing, undivided roadway provides a woodland appearance. Medians should be a minimum of eight feet wide to allow for adequate planting area. Where curb lane parking is provided, the parking lane should be thirteen or fourteen feet wide for off-peak parking and bicycle traffic. Where provided, bike lanes should be a minimum of five feet wide, clearly designated, and striped to separate them from the main roadway. Following is an explanation of the proposed cross-sections, which are illustrated in Figure 6.4.1-b.

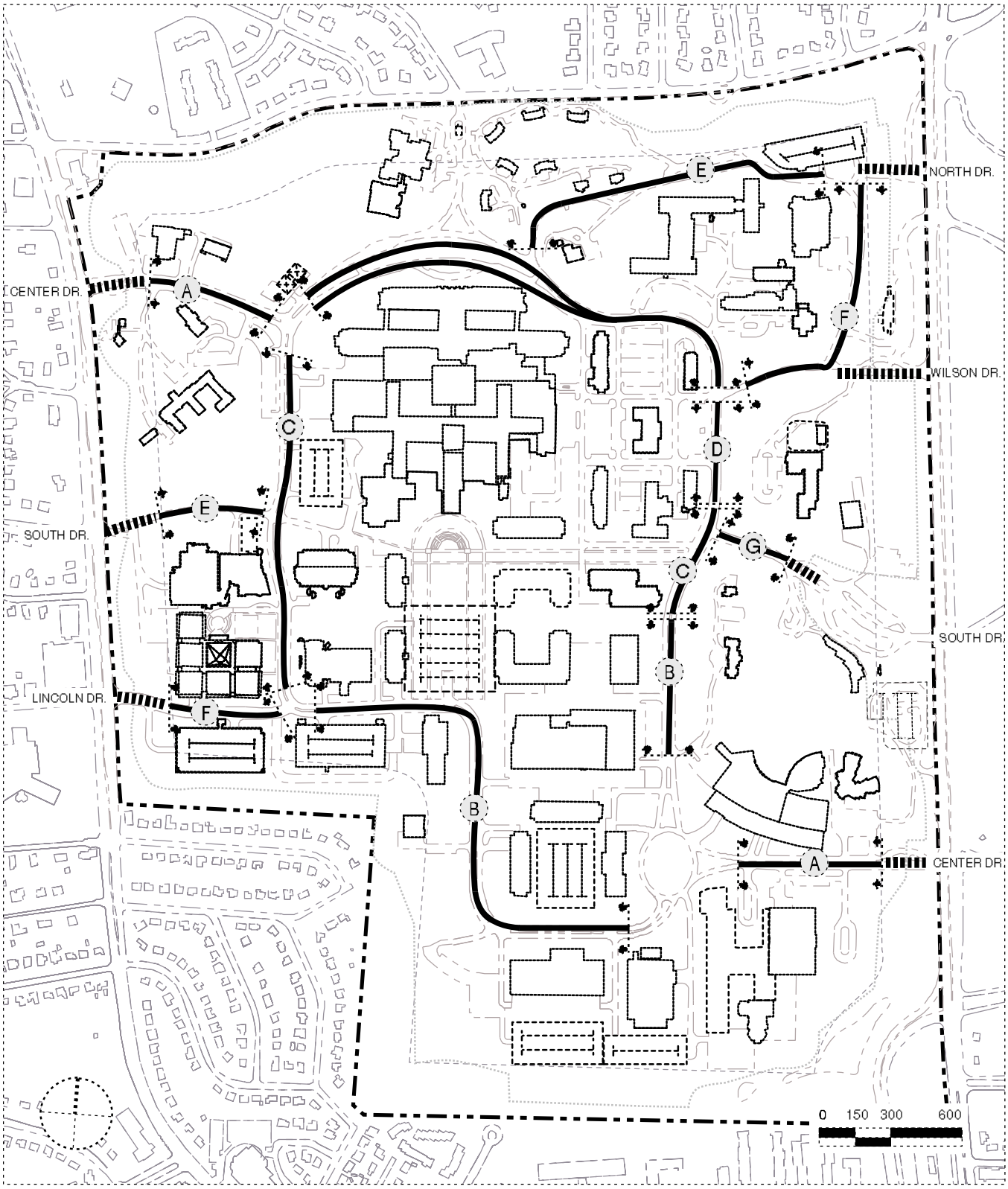

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Figure 6.4.1-a

- (A) 4 LANES, MEDIAN, BIKE LANES - WIDTH 62'
- (B) 4 LANES, MEDIAN, BIKE LANES/OFF-PEAK PARKING - WIDTH 56'
- (C) 2 LANES, BIKE LANES/OFF-PEAK PARKING - WIDTH 48'
- (D) 2 LANES, OFF-PEAK PARKING LANES - WIDTH 40'
- (E) 2 LANES - WIDTH 22'
- (F) 2 LANES, BIKE LANES - WIDTH 30'
- (G) 2 LANES, MEDAIN, BIKE LANES - WIDTH 40'

VEHICULAR GATE

Roadway Types

- **Section A** is designated for major site entries. The roadway provides four moving lanes with marked bike lanes in both directions. The minimum eleven-foot wide lanes are recommended because of the high volumes of traffic anticipated in this area. No curb parking is allowed in this section.

- **Section B** is the north and south loop road section. This roadway type has one ten foot wide travel lane and one fourteen-foot travel lane in each direction. The ten-foot wide travel lane would be for vehicles only and the fourteen-foot wide lane would serve as an on-street, off-peak parking/bicycle travel lane and a mixed vehicular/ bicycle travel lane during the peak periods. Two travel lanes, separated by a landscaped median, are recommended in each direction during the peak periods since traffic volumes are anticipated to require four moving lanes.

- **Section C** is the west and east loop road section. This roadway type has one ten-foot wide travel lane and one fourteen-foot travel lane in each direction. The ten-foot wide travel lane would be for vehicles only and the fourteen-foot wide lane would serve as an on- street, off-peak parking/bicycle travel lane and a mixed vehicular/ bicycle travel lane during the peak periods. Two travel lanes are recommended in each direction during the peak periods since traffic volumes are anticipated to require four moving lanes. No median is included as part of this cross-section due to the physical constraints of providing for it.

- **Section D** is the loop road in front of Building 1. Due to the constraints of the historic buildings to the west and steep slopes to the east, this roadway section was kept as narrow as possible. The roadway provides two ten-foot wide travel lanes in each direction. Two travel lanes are recommended in each direction since traffic volumes are anticipated to require four moving lanes during the peak periods.

- **Section E** is used for roadways with relatively low traffic volumes or which pass through woodland areas, in an effort to avoid the removal of existing trees. This roadway type has one, eleven-foot travel lane in each direction.

- **Section F** consists of a thirty-foot cross-section with one ten-foot travel lane in each direction with one five-foot bicycle lane in each direction.

- **Section G** is for the East South Drive entry to campus. This roadway type has one eleven-foot wide travel lane and one five-foot exclusive bicycle lane in each direction. There is no on- street parking in this roadway section type.

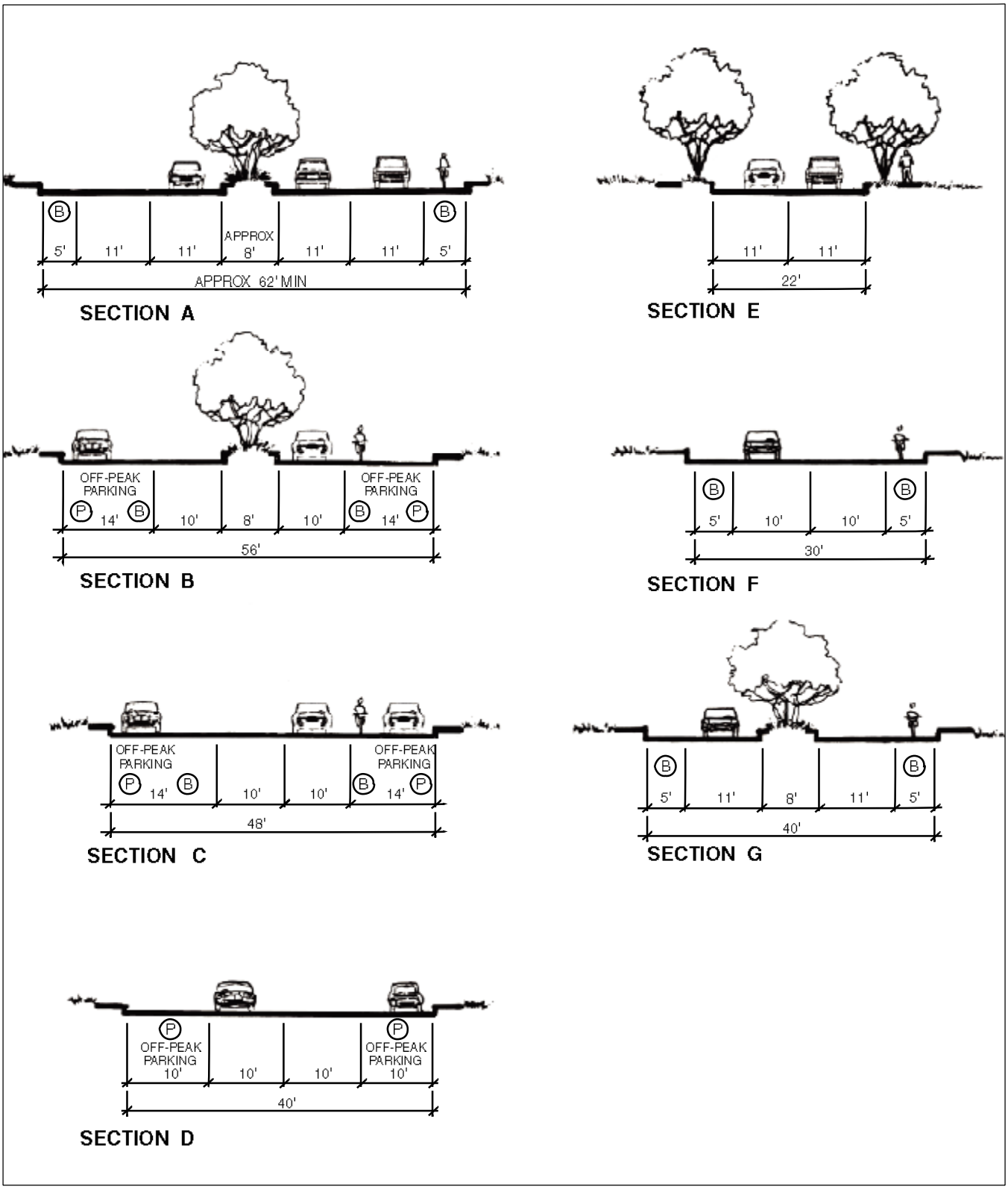

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Figure 6.4.1-b

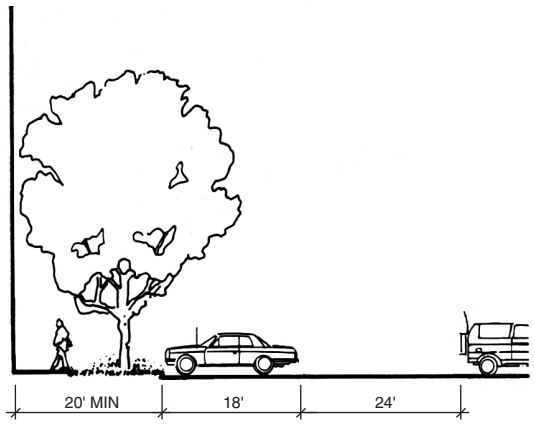
Typical Roadway Sections

6.4.2 Parking

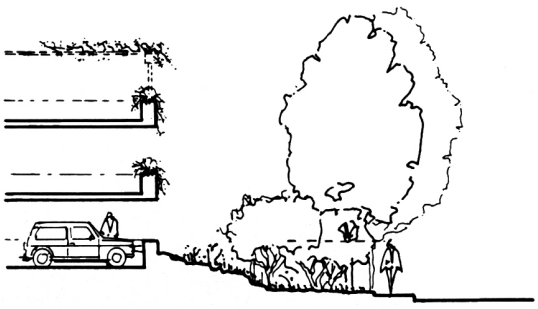
Where possible, surface-parking areas should be reduced within the campus, and surface parking should be removed from the buffer zones at the perimeter of the campus. Surface parking should be screened at its perimeter with planting, berms or low walls. Parking lots should have interior planting islands to break up large expanses of paved area.

Parking decks should be integrated into the topography where possible, and should be screened by landscape or have planting areas integral with their perimeters, such as planter boxes or trellises. For examples of parking screening techniques, see Figure 6.4.2.

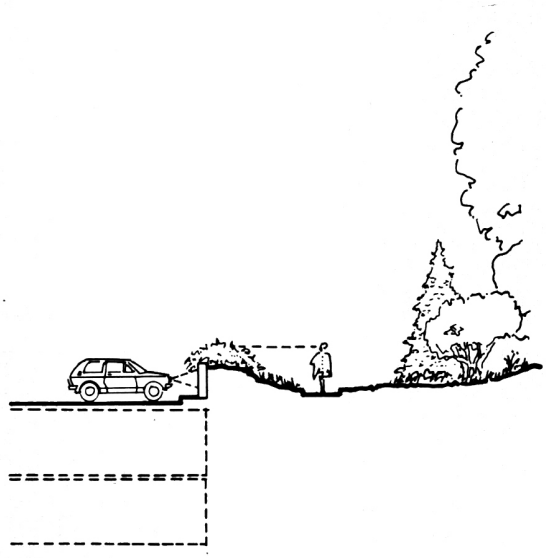
Curbside parking should be designated for limited time and off-peak hour use, with appropriate signage and enforcement. Limiting curbside parking to off-peak hours and limited time periods will maintain a reserve of parking spaces intended for off-campus employees coming to the site for part-day activities. This arrangement will also allow increased traffic flow at peak hours by providing extra travel lanes. Accessible parking for persons with disabilities should be placed as near and convenient to buildings as possible.



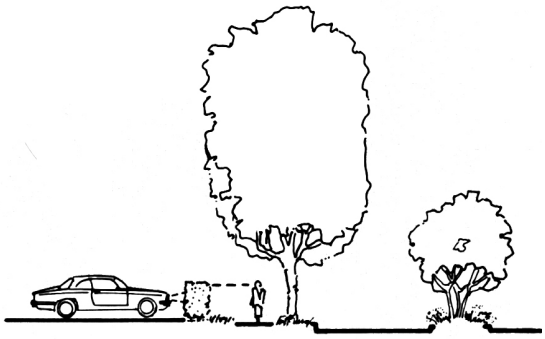
1 TYP SURFACE PARKING NEAR BLDG



2 TYP PARKING DECK SCREENING



3 TYP SURFACE PARKING SCREENING



4 TYP SURFACE PARKING SCREENING

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Figure 6.4.2

Typical Parking Guides

6.4.3 Service

All future commercial delivery truck traffic will access the NIH campus using the CVI truck entrance, where there will be an on-site inspection facility. The truck entrance will be located south of the North Drive employee-only entrance, and will only provide access to the inspection facility. Commercial vehicles, which pass inspection, will be allowed to continue onto campus, to their final destination after concurrence with the destination building dock master to avoid congestion at the destination point.

Since service/delivery areas are necessities for virtually all buildings on campus, the placement and design of these areas must be considered carefully. Generally, the following guidelines should be administered for the design of service/delivery areas, as illustrated in Figure 6.4.3.

All major loading areas should be provided at the ends or rear of buildings. Some short-term delivery service should be provided in short term visitor parking near the front of the buildings. Long term vendor and contractor parking should be provided in long term parking facilities. In no case should major loading be permitted on- street or in parking facilities.

The number of access driveways on the internal loop road has been limited by providing shared service/delivery areas for groups of buildings. This consolidation of the service/delivery areas will minimize conflicts in the internal road system. In site areas where grades and slopes of the topography permit, service/delivery areas should occur at a lower level. In all locations service/delivery areas should be screened by walls and/or landscaping.

The design of the access driveways from the internal loop road system should be provided with adequate sight distances and proper turn-around areas for trucks within the access drive layout. In general, access driveways for service/delivery vehicles and employee or visitor passenger vehicles should be separated. Although these criteria may not be feasible in all cases, it is a good policy to reduce the possibility of the access driveway being temporarily blocked by a service/delivery vehicle.

6.4.4 Pedestrians and Bicycles

Pedestrian Pathways

The existing system of extensive pedestrian paths on the NIH campus should be enhanced to increase the capacity of certain highly trafficked areas, make better connections from the campus core to surrounding neighborhoods, and form a more continuous pathway system. Employee pedestrian access to the NIH campus will be provided for employees at all vehicular and pedestrian/bicycle employee-only gates in the perimeter fence. Pedestrian access to the NIH campus will be provided for NIH visitors through the South Drive Gateway Center entrance located on Rockville Pike and at the Cedar Lane entrance.

Pedestrian crossings of campus roadways should generally occur at intersection points along the loop road and at the entrance driveways from the county and state road system. It is anticipated that the internal, unsignalized intersections will operate as three-way stop intersections. This intersection type will facilitate the crossing of small groups of pedestrians. All pedestrian crossings should be clearly signed and lighted, with crossing areas designated by striping, special paving, raised road surface, or other appropriate marking devices. Medians should be designed to provide pedestrian refuge areas. In addition, the implementation of mid-block pedestrian crossings at certain locations may be provided. Vehicular traffic through these mid-block pedestrian crossing sections is not required to stop if the pedestrian area is clear; but is required

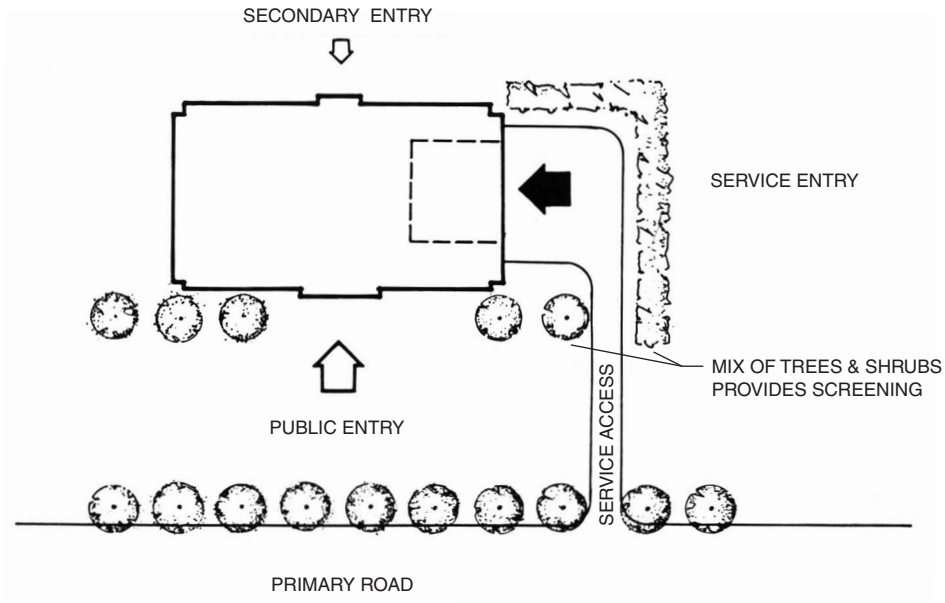

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Figure 6.4.3

Typical Service Area Guides

to yield to pedestrians in the cross walk. The mid-block pedestrian crossing area should be clearly signed, striped, and lighted, and may also include a median for pedestrian refuge.

In order to minimize the chance of vehicular-pedestrian conflicts, the NIH should adopt some crosswalk location guidelines to standardize the location of future crosswalks on campus. The following elements should potentially be used as part of a new crosswalk location policy, to regulate when and where future crosswalk installation is appropriate on the NIH campus:

- Crosswalks should be provided at all roadway intersections;
- Crosswalks should not be used indiscriminately;
- Crosswalks should allow for restriction of parking in the immediate appropriate vicinity for adequate visibility;
- Crosswalks should be sited based on an engineering study if located other than at an intersection;
- A non-intersection crosswalk location should only be considered when all of the following circumstances are present: 1) The distance to the nearest intersection exceeds 300 feet, 2) There is a proven demand for a crossing at the subject location with pedestrian crossing volume that exceeds 100 pedestrians during any one hour, or 150 pedestrians during any two consecutive hours within a 24-hour period, 3) There is adequate sight-distance and other critical safety conditions are satisfied, and 4) The location of the crosswalk does not conflict with any aspect of the campus plan.

NOTE: If all of these conditions are not satisfied and there are any significant signs of pedestrian activity near the subject crossing location prior to the installation of a crosswalk, then the subject location may warrant the placement of a pedestrian barrier to ensure that pedestrians do not cross at the non-intersection location, but rather walk to the nearest marked crossing location.

Bikeways

On-site bikeway facilities are an important element in the promotion of alternative transportation modes for employees of the NIH Bethesda campus. In addition, it is important for the NIH Bethesda campus to link with the Montgomery County Bikeway System for the broader countywide promotion of alternative transportation modes. Bicycle access will be provided for employees at all vehicular entrances and pedestrian/bicycle employee-only gates in the perimeter fence. Bicycle access to the NIH campus will be provided for NIH visitors through the South Drive Gateway Center entrance located on Rockville Pike and at the Cedar Lane entrance.

Bicyclists should be encouraged by signage and policy to walk their bikes in congested areas. In addition to the specially NIH-designated bikeway facilities, bicyclists can often ride in the outer travel lane along roadways with speeds of 30 miles per hour or less. All internal roadways on the Bethesda campus will be signed for speeds of 20 to 25 miles per hour, and therefore it is expected that bicyclists will utilize the loop road system to circulate around the campus, with the exception of the loop road segment between South Drive and Wilson Drive (in front of Building 1) on the east-side of campus. However, it is important that the roadway be regularly maintained and cleared of debris, and that drainage grates be designed flush to the surface with narrow grid openings (so that bicyclists do not get trapped as with conventional parallel, widely spaced grates).

6.4.5 Mass Transit

Metrorail and local bus service is provided to the NIH Bethesda campus at the Medical Center Metro Station on the Red Line. This station and related transit node is located near the intersection of South Drive and Rockville Pike.

Because of the size of the Bethesda campus and the campus edge location of the Metrorail station, it is necessary to provide a means for employees using Metrorail to get to and from the various employment centers around campus. The NIH currently operates internal campus shuttle bus routes.

Shuttle riders transfer between the two systems at the NIH Gateway Center, in order to travel between interior campus locations and off-campus NIH facilities. This bus service is provided as a part of the Transportation Management Program.

All shuttle bus stops should provide adequate covered waiting area at the stop or at nearby buildings. The on-campus shuttle bus stops are located along the loop road in close proximity to most major destinations or building clusters. However, there may be a few shuttle bus stops located directly in front of building entrances, as determined later by the operators of this system.

The Master Plan calls for a continuous, four-lane loop road throughout the interior of the campus. This loop road will allow for more efficient operation of the shuttle bus service provided on campus. The Employee Transportation Services Office (ETSO) currently acts as a liaison with WMATA and Montgomery County Ride-On. This liaison allows for the coordination of the NIH shuttle bus, WMATA, and Ride-On bus services.

6.4.6 Access for Persons With Disabilities

For implementation of access standards, see the Uniform Federal Accessibility Standards (UFAS).

6.5 Site Performance Guidelines

6.5.1 Building Character/Materials

Figure 6.5.1 indicates the Building Character and materials recommended for each zone of the site. In general, the Master Plan recommends that all new construction in the central core be of Brick - Modern design, and that buildings at the perimeter of the site be of Concrete / Stone - Modern design, reinforcing the pattern that currently exists. The predominant material for central core buildings should be red brick, responding to the materials of the Historic Core and numerous other central campus buildings. Structures at the perimeter should be predominantly white or light in color. Outside of the Historic Core and away from historic properties, it is preferred that a contemporary architectural vocabulary be used to express the technology and aesthetic of the time of construction. Within or directly adjacent to the "exception zones" as delineated in Figure 6.5.1, projects should be designed to be compatible with the existing historic or special character of the buildings within the zone.

6.5.2 Landscape Design and Planting Criteria

Figure 6.5.2-a, shows the proposed Landscape Concepts and Planting Patterns for the NIH Bethesda Campus. Further guidance is given in the NIH Bethesda Urban Forest Stand Delineation and Conservation Plan.

Planting Patterns and Scale

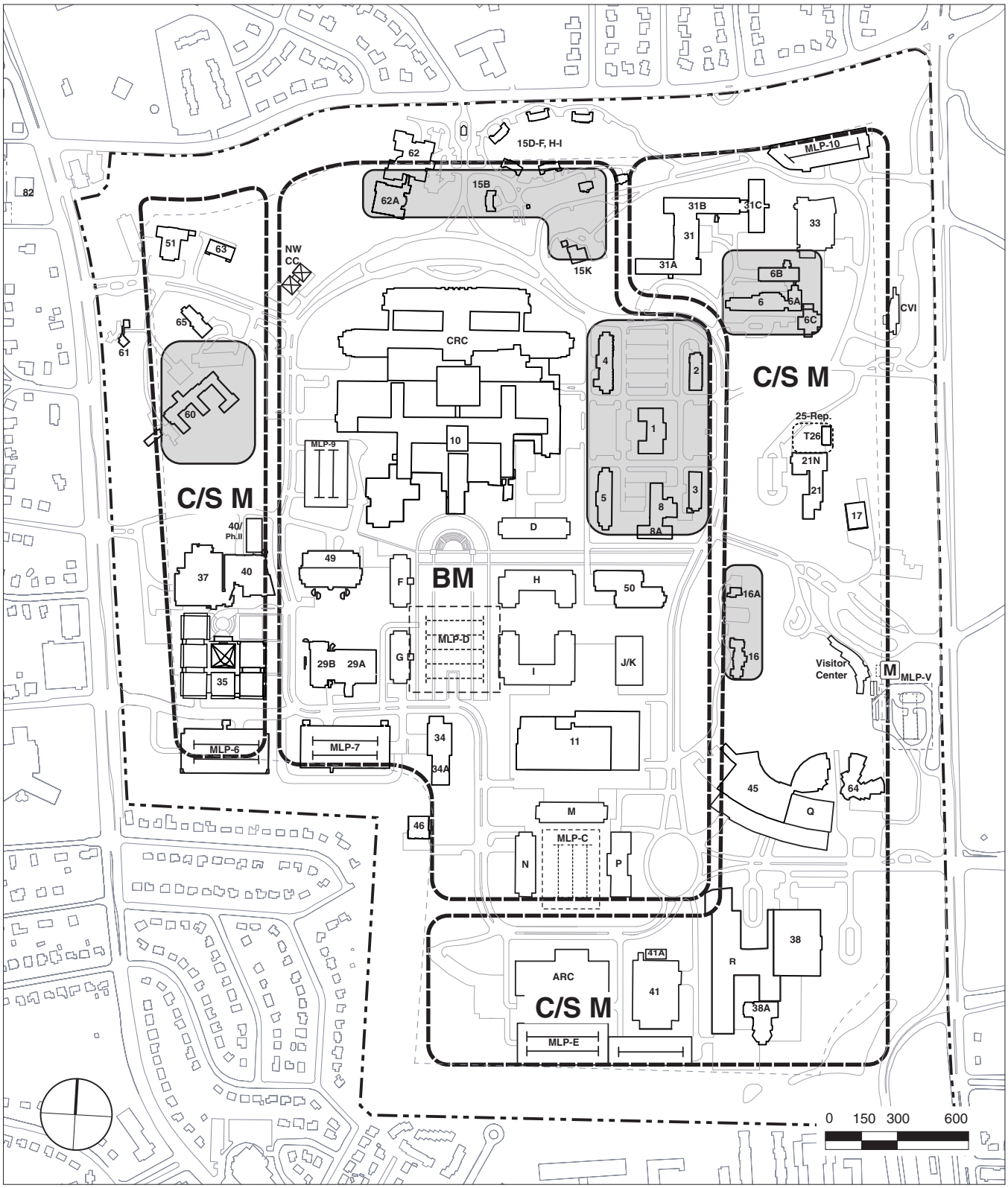
The size of trees, shrubs, and plant beds should be considered with respect to their scale relationship to the NIH campus buildings, roads, and spaces. In general, plantings should be simple and conceived in broad masses that are appropriately scaled to the campus. In addition, there should be a hierarchy of plantings, ranging from large tree and shrub massings along roads and entries, down to small garden scale plantings and floral display beds in courtyards and pedestrian gathering areas.

Plants can also serve to punctuate and reduce the scale of stairs, walls, terraces, and building facades, through the use of hanging, twining, or climbing plants, which can help the buildings and spaces become part of the landscape. Plants should be used to soften the edges of buildings, paths, and outdoor areas with flowers.

Plants selected for use on the NIH campus should be an indigenous or native species, possess appropriately long-lived characteristics, and have visual traits that offer refined intrinsic beauty to reflect the enduring quality of the institution. The overall design of the campus planting should be simple and seek to evoke a mood of tranquility to complement the existing natural and surrounding plantings. It is also recommended that the use of annuals and perennials be encouraged to create an uplifting campus environment for NIH visitors and employees.

Care should be exercised in the use of exotic or highly ornamental plants, and as a general rule should not be used in the more natural perimeter landscape. They should only be used in the central core areas, in association with pools, in enclosed courtyards, and internal landscape spaces between buildings and parking areas. Simple refined patterns will yield a campus that is unique, dignified, and practical to maintain.

The natural forms of plants should be retained through restrained but proper pruning techniques. This is most important when considering shrubs. Shrubs should be planted in arrangements that allow for their natural shape to be retained through periodic renewal pruning. Adequate space must be allowed for plants to grow, particularly near paths and buildings, in order to avoid heavy shearing of these plants which often makes them unnatural and unattractive.



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EXCEPTION ZONE
C/S M CONCRETE/STONE MODERN
B M BRICK MODERN

Figure 6.5.1

Building Character Zones

periodic renewal pruning. Adequate space must be allowed for plants to grow, particularly near paths and buildings, in order to avoid heavy shearing of these plants which often makes them unnatural and unattractive.
Tree pruning should start early in the life of campus trees to ensure that a proper form is established and the canopy is promoted and trained to a sufficient height to provide clear visibility beneath trees for autos and pedestrians, and to allow adequate light to lawn areas below.

Selection and placement of plant materials should be made in accordance with lighting and security cameras to avoid obscuring views and creating hard to see places. Trees and shrubs must be kept away from the perimeter fence to prevent their use for climbing over the fence.

Buffers and Perimeter Screening

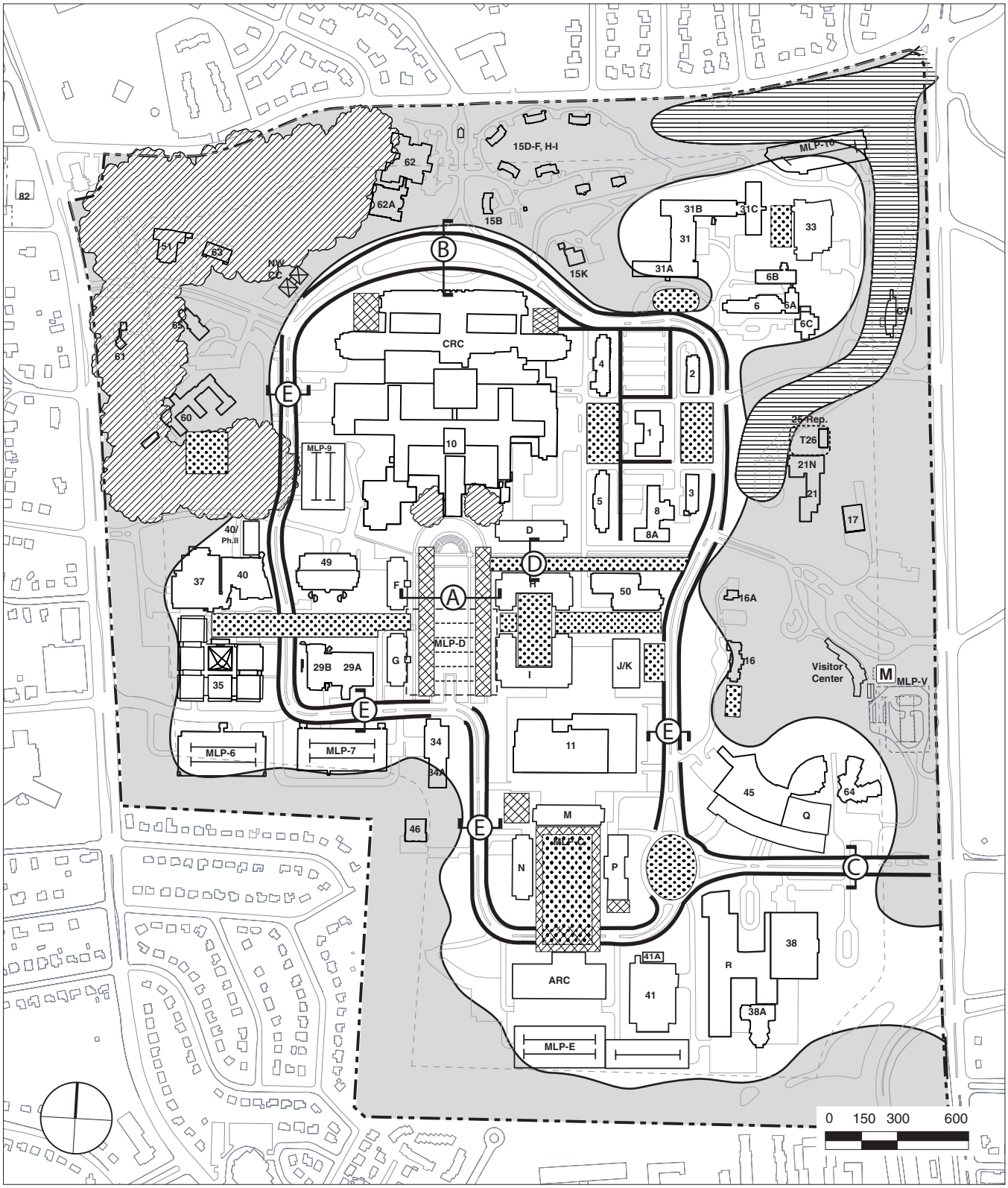
There are three primary long-term objectives for enhancing the perimeter landscape and buffer areas of the NIH campus. The first is preservation. The existing stands of large native trees and areas of natural vegetation that currently provide screening and buffering to the surrounding residential areas are to be maintained. The second is managed renaturalizaton. As surface parking areas are removed from the campus perimeter, these areas will need to be replanted with native and indigenous varieties of plant material to extend and augment the buffer plantings. In addition, open lawn and mowed turf grass areas not designated for recreational purposes should also be planted or reforested in order to reduce grounds maintenance areas. These areas need to have a natural yet controlled or maintained appearance, with curvilinear lawn edges, shrubs, and understory tree massings. The third will be general environmental improvements as a result of the first two objectives. Preservation and reforestation will provide the direct environmental benefits of cooling, enhanced storm water management, erosion control and water quality, increased species diversity, and reduced water and energy consumption for grounds maintenance.

With these objectives in mind, aesthetic design consideration should be focused on maintaining some open views into the site to visually prominent buildings and landscape features from Rockville Pike and Old Georgetown Road. These areas may benefit from the use of high canopy trees and understory plantings to filter and direct these views. Reforested areas should not be designed as strict restorations of the existing woodland communities that naturally occur in the region, but rather as general compositions and structures that simulate the plant communities of the Piedmont Region, implemented to complement the existing landscape patterns and provide spatial definition to the NIH campus. In addition, any reforestation, screening, and buffering in the perimeter areas will require careful study and fine tuning to ensure that design consideration to the campus safety and security is maintained.

Plant Material Palettes

An underlying concept in the development of the Landscape Plan for the NIH campus is the recognition of the medicinal values of plants and water. This medicinal theme can contribute to a deeper understanding of the landscape, its relationship to mankind and the environment, and its relationship to the mission of NIH.

Potential uses and combinations of plants may take on many forms in the landscape development of NIH. For example, plants may be used primarily in cultural associations such as hot/sunny, cool/moist, or dry/shade garden conditions to name a few. Other material uses can be based on purely aesthetic considerations such as color or textural combinations, accent or screening applications, and to control scale and spatial hierarchy within the central core of the NIH Bethesda campus.



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BOSQUE PLANTING
STREET TREE PLANTING
STREAM VALLEY/RIPARIAN
UNDERSTORY/FOREST EXTENSION
BUFFER/PERIMETER
QUAD/COURTYARD/GARDEN

Figure 6.5.2-a

Campus Planting Patterns

NIH / ORF / DFP

Oudens & Knoop, Architects, P.C.

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Finally, trees and plants can be displayed in numerous programmatic arrangements, such as grouping together plants with similar traditionally held medicinal values, or to display medicinal plants with exceptional seasonal qualities, for winter, spring, summer, and fall garden themes. These plant groupings may be signed in an interpretive manner so that their uses can be better understood and appreciated. As mentioned previously, care should be exercised in the use and location of these materials.

Special Landscape Areas and Features

The sections shown in Figure 6.5.2-b indicate in greater detail the landscape character and recommendations proposed for key areas of the site.

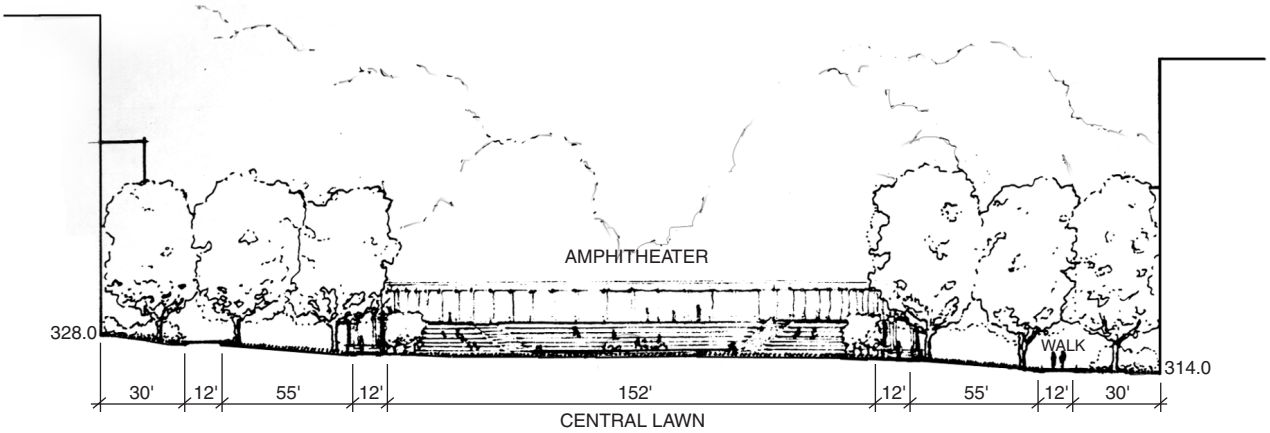
- **Section A** indicates the proposed landscape treatment of the Central Mall. A triple row of trees is proposed to frame this central open space, with a pedestrian concourse between the trees. Changes in grade are proposed to be accommodated within the bosque areas at the edge of the mall. The mall itself is envisioned as a grassy, open area. The mall is proposed to be terminated on the north end by an amphitheater with informal tree plantings as a backdrop.

- **Section B** shows the area to the north of the Clinical Research Center. Bosques are densely planted on the south side of the loop road, flanked by walkways. The median is planted with groundcover and ornamental trees. The existing tree cover is maintained on the north side of the loop road, within a natural landscape character.

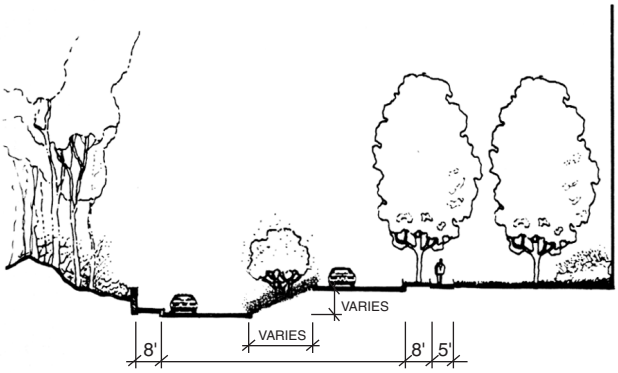
- **Section C** shows the proposed treatment of the main campus entry on Center Drive at Rockville Pike, near Building 45 (the Natcher Building). This area is shown to be formally landscaped with double rows of trees on either side of the road and a landscaped median in the center.

- **Section D** shows the proposed major east-west pedestrian walkway between Center Drive and the Central Mall. In this area, linear planting beds, and potentially and water features, symbolically connect the NIH Stream with the center of the campus. The section also shows the accommodation of a vehicular roadway (if needed) adjacent to Building 8A.

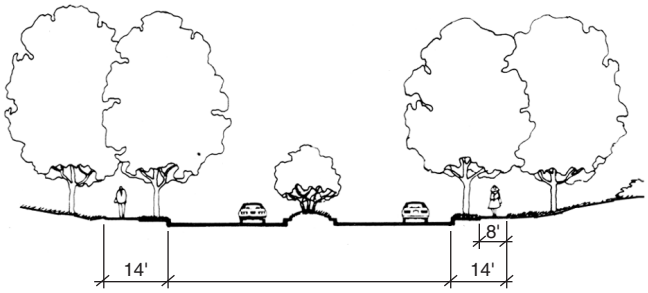
- **Section E** is the typical loop road section, with street trees planted on each side and ornamental trees planted in the median. Where possible, it is recommended that pedestrian walkways be separated from the roadway by a minimum 6-foot planting strip.



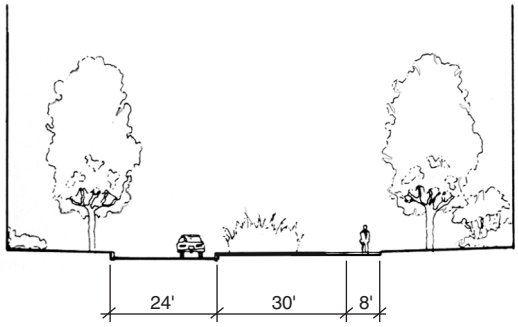
A SECTION @ CENTRAL MALL



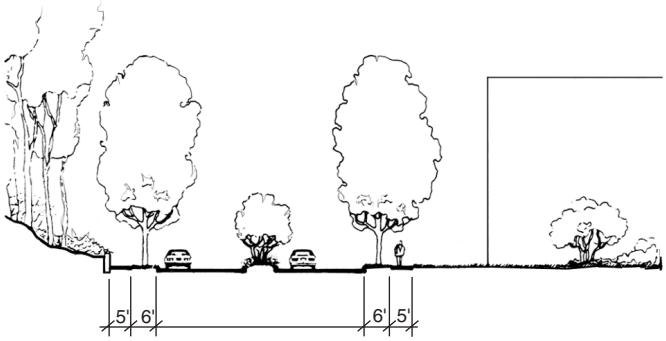
B SECTION @ NORTH SIDE OF CLINICAL RESEARCH CENTER



C SECTION @ MAIN CAMPUS ENTRY ON CENTER DRIVE & ROCKVILLE PIKE



D SECTION @ EAST-WEST PEDESTRIAN WALKWAY



E TYPICAL LOOP ROAD SECTION

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Figure 6.5.2-b

Landscape Special Areas

6.5.3 Streetscape/Pathscape

The NIH is currently considering a comprehensive streetscape, signage and lighting master plan. The plan will include recommendations for the enhancement of existing streetscape design and pathscape according to street type, location, and physical condition of existing streetscape and paths.

Street Tree Recommendations

The primary planting objective for main campus entry roads and the loop road system around the central core area should be to define the campus streets as continuous spatial corridors and to create a uniform appearance. The use of a uniform tree type and spacing will help control the variation of landscape, building conditions and setbacks along the campus streets. As a general rule, the Master Plan recommends the use of large deciduous trees along streets in order to form a continuous canopy that will provide foliage at a height from fifteen to sixty feet above the ground, while allowing open views below the branches.

The sycamore (London Planetree), which grows in numerous locations throughout the NIH campus and is commemorated as the Tree of Hippocrates near the National Library of Medicine, is proposed as the keystone tree planting for the central campus bosques. Due to its symbolic importance and ability to survive in an urban setting, this species is proposed to be used as linear tree bosques within the Campus Core, both to frame the Central Mall and help form and articulate important building entries and gathering spaces. It is also recommended that sycamores be used as a bosque planting between the loop road section north of the Clinical Research Center. These dense tree bosques would also serve to reduce the scale of the buildings and provide more intimate spaces for patient and staff use.

Suggested street tree planting of the primary entry from Rockville Pike consists of a double row of Red Maples. Planting along the interior loop road is proposed as a single row of street trees, consisting of combinations of Willow, Laurel and Sawtooth Oaks to reduce monoculture concerns yet maintain a consistent size and similar tree form. Other entries to the campus should have informal tree plantings which relate to the indigenous types present, such as Tulip Poplars, White and Red Oaks, Ash, and Black Gums. These trees may also be planted with understory groupings of ornamental trees, evergreens and shrub plantings. In general, street trees should be selected which have deeper root systems in order to reduce potential future damage to walks and roadways. Additional tree species for consideration include Silver and Weeping Silver Lindens, Crownright Pin Oaks, and Halka Honeylocusts, which have a more uniform upright structure.

Detailed Streetscape Layout Recommendations

The typical streetscape proposed by the Master Plan is shown in Figure 6.5.3. Where possible, roadways should be bounded by planting strips of a minimum dimension of six feet to accommodate street tree planting. Within the planting strip there should be occasional paved areas for access to the curb lane of the street, and in highly traversed areas, continuous paving with tree grates may be required. Also accommodated within the planting strip are streetlight posts, information kiosks, and roadway regulatory and directional signage.

Beyond the planting strip is the pedestrian walkway, which is recommended to have a width of 5 feet minimum or 6 feet where space permits. In locations where room permits, walkway widths of six feet would allow the walks to accommodate service vehicles, if needed. Paths and walkways will generally be constructed of concrete or asphalt, however, special paving patterns and materials should be used to highlight key areas such as plazas and major building entrances. It is recommended that a

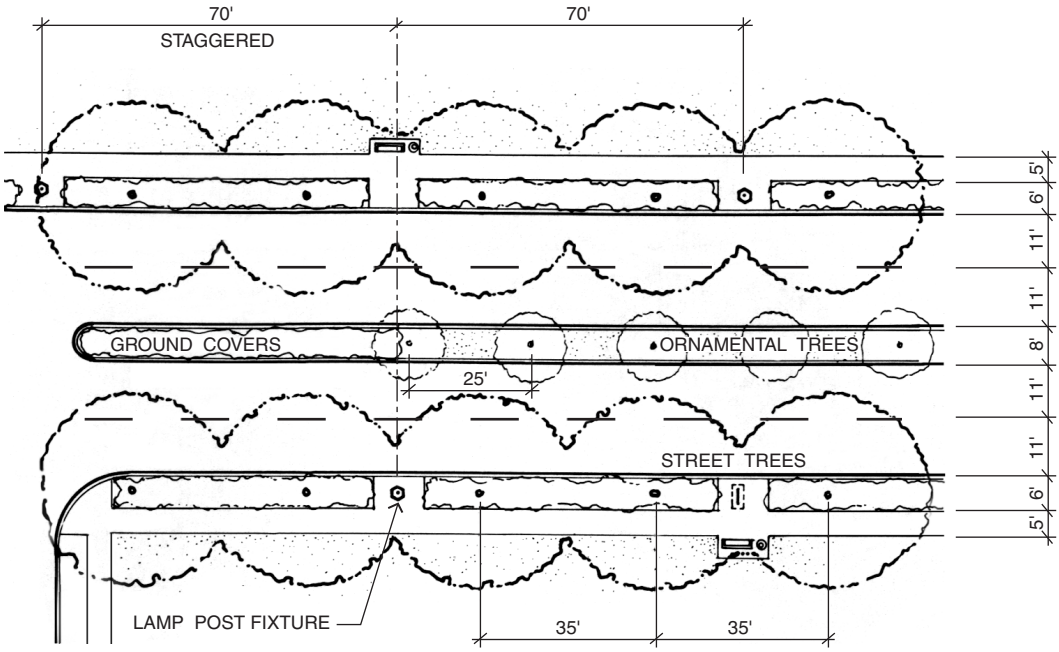

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Figure 6.5.3

Streetscape Typical Plan

standard quality paving material be used throughout the campus to ease maintenance and enhance campus coherence. Also within this zone should be seating areas associated with building entries, bus and shuttle stops, and pedestrian gathering places. These should be furnished with comfortable benches, trash receptacles, pedestrian lighting and landscaping.

Currently site furnishings on campus are not well coordinated either by style or location. The Master Plan recommends that seating, receptacles, bollards, and kiosks, which are functional, easily maintained, and aesthetically compatible, be adopted for use throughout the campus. The use of durable wood and natural materials for site furnishings is encouraged. These elements will not only provide pedestrian scale and comfort, but also visually unify the campus environment. Special emphasis should be given to increasing seating areas through the use of low seat walls, picnic tables, and chairs throughout the campus, in order to improve the quality and location of outdoor places for eating and relaxation within the extensive grounds of the NIH campus.

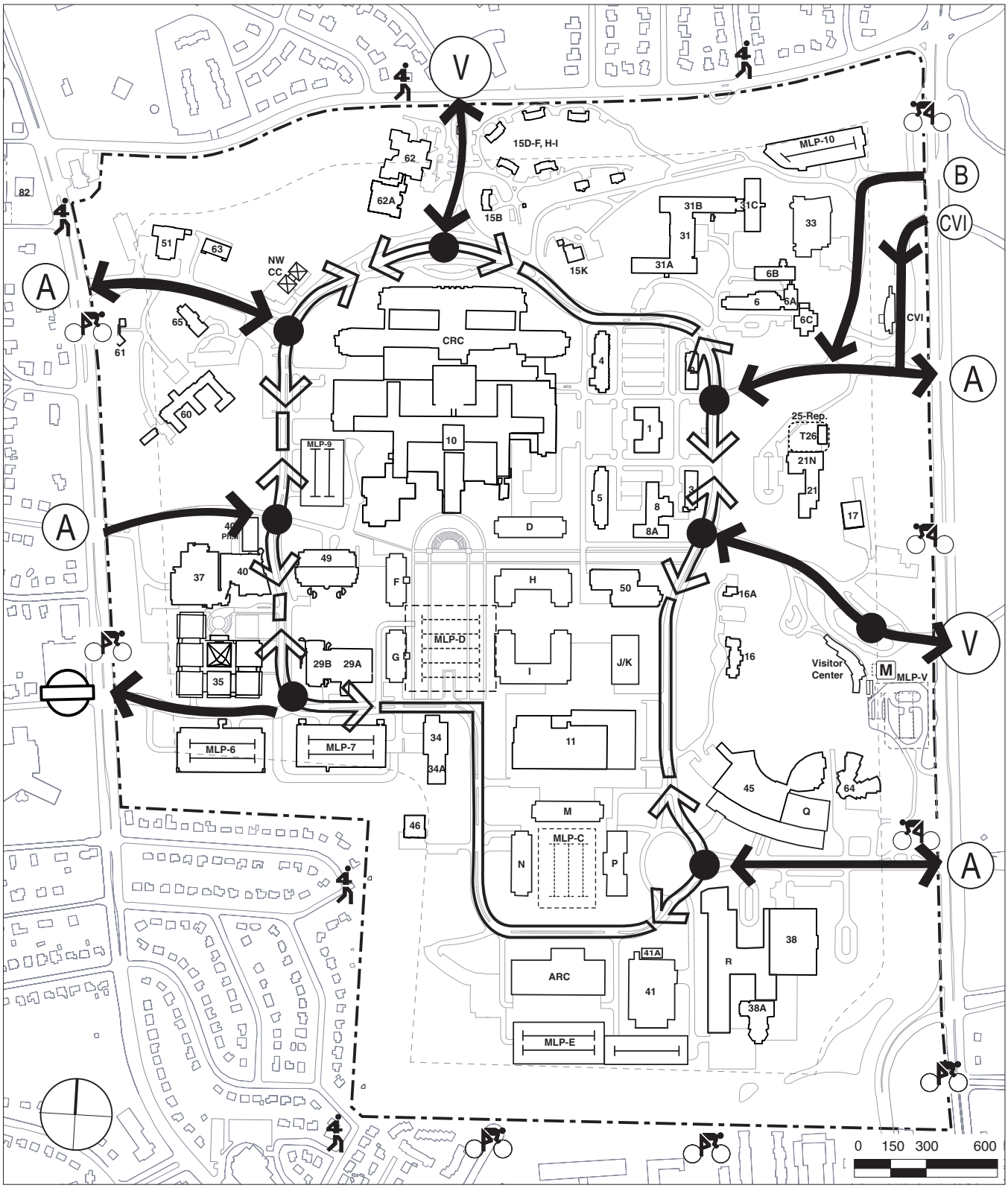
6.5.4 Exterior Signage

The NIH is currently considering a comprehensive streetscape, signage and lighting master plan. The plan will include recommendations for the upgrade or replacement of the existing signage system according to sign type, location, graphic quality, physical condition and maintenance, currentness of information, and adequacy of the amount of signage. The categories of signage which will be addressed include the following:

- **Orientation -** site maps near campus entries and area maps in the core of the campus.
- **Direction -** to major campus buildings and areas, both for vehicles and pedestrians. Notations of accessible routes for persons with disabilities.
- **Identification -** campus entry signage and exterior building and place signage.
- **Regulatory/Safety -** traffic and parking control, safety, and warning signage.
- **Information -** transit information, public announcements, etc.
- **Interpretive -** NIH tour signage, plant species signage, etc.

Figure 6.5.4 illustrates the key signage concepts proposed by the Master Plan. Visitor and staff entries should be clearly and coherently signed to both identify the NIH campus and create a positive first impression of the institution. At the juncture of each entry path (including pedestrian/bicycle paths) with the loop road there must be clear directional signage to major campus buildings. Where possible, a vehicular pull-off with a campus map should be provided at each major vehicular entry path. Along the loop road, signage should be consistent and become a clear orientation tool. A new Gateway Center for visitors containing information is indicated in the Master Plan at the Metro transit area. This location is clearly accessible to both public transit users and visitors arriving by automobile. Additional campus and transit information will be located at the Campus Center (Building L) and at the Clinical Research Center (CRC).

Signage character should be clearly legible and should be of a quality appropriate to a world renowned institution. There should be design compatibility among all campus sign types. Signage placement should also be carefully considered to avoid visual clutter. Specifically, regulatory and traffic signage should be reviewed to determine if more compatible signage designs can be implemented rather than the standard uniform roadway signs which are now used.



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- (A) MAJOR ENTRY SIGNAGE
- (B) SECONDARY ENTRY SIGNAGE
- (V) VISITOR ENTRY SIGNAGE
- (CVI) CVI ENTRY SIGNAGE
- KEY DIRECTIONAL SIGNAGE
- LOOP ROAD SIGNAGE
- BICYCLE/ PED. ENTRY SIGNAGE
- PEDESTRIAN ENTRY SIGNAGE
- NO ENTRY / EXIT ONLY

NOTE: See Figs. 5.3.8-a&b for pedestrian and bicycle circulation plans.

Figure 6.5.4

Signage Concept Plan

6.5.5 Exterior Lighting

The NIH is currently considering a comprehensive streetscape, signage and lighting master plan. The plan will include recommendations for the upgrade or replacement of exterior campus lighting according to light fixture type, location, light quality, fixture and lamp condition, and adequacy of the number of light fixtures. Categories of lighting, which should will be addressed, include the following.

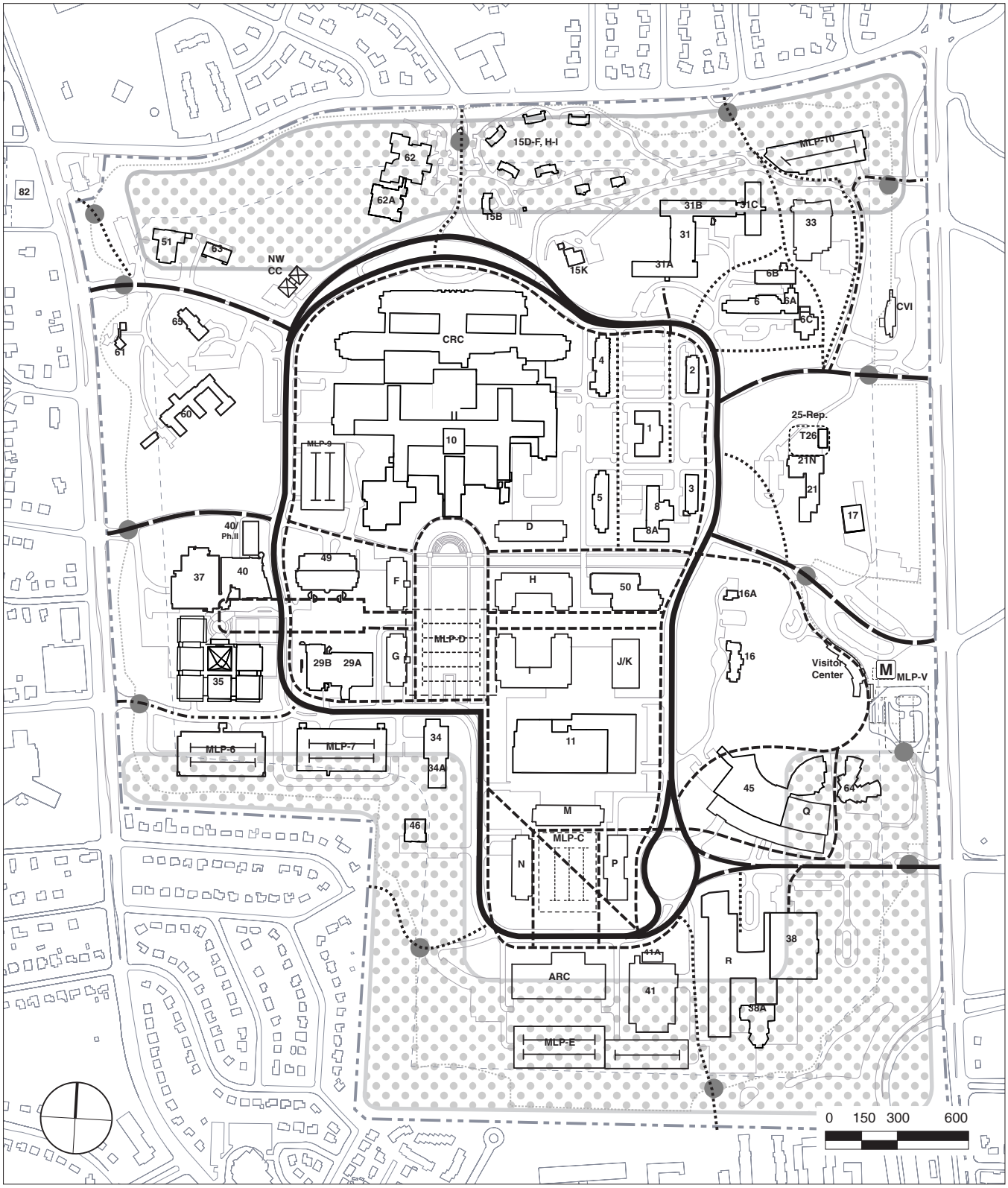
- **Street -** for vehicular safety and general campus illumination.
- **Intersection -** special lighting at roadway intersections.
- **Pedestrian -** for pedestrian safety and path marking.
- **Building -** to identify building entries and provide security.
- **Safety/Security -** for areas of the campus, that pose danger or require surveillance.
- **Signage -** at major entry locations and for key directional and orientation signage.
- **Special Features -** building or landscape highlighting, special outdoor spaces or monuments.

Figure 6.5.5 illustrates the major Master Plan lighting concept recommendations. The major campus entry roadways should be of a single lighting character to identify them as entryways. Loop road lighting should be of a second distinct character to provide coherence to the core of the campus. Within the campus core, lighting for major pedestrian pathways should create a consistent and unified framework which reflects the hierarchy of the principal paths. Branching out from this central framework, lower intensity pedestrian lighting should provide a network of lighted paths connecting all building groups on the campus. Of particular importance is the creation of well-lighted and secure pathways to the Metro station, for employees and visitors. In general, lighting should be less intense at the periphery than at the core.

Figure 6.5.5 also delineates a light control zone at the north and south ends of the campus. In these areas, special attention should be given to avoid spillover lighting into adjacent neighborhoods. Full-cutoff light fixtures, which allow no light to be emitted above a designated horizontal plane, should be used for roadways, walkways, parking structures, and buildings. Increased landscape screening should be provided in the buffer zone, and special architectural light screens should be considered where necessary.

There are currently many lighting fixture types on the NIH campus. The Master Plan recommends that all defined campus lighting systems (the loop road, major pedestrian framework, primary entries, etc.) each be of a single fixture type. Individual building projects may continue to differentiate fixture types for buildings and surrounding area lighting, within a complementary style to other campus lighting. In general, roadway light fixtures should be between 25 to 30 feet high, while major pedestrian path fixtures should be between 12 to 15 feet high. Secondary pedestrian path fixtures may be pole mounted luminaires or bollard type fixtures.

Fixture lamps should be selected for energy savings, light quality, and maintenance characteristics. Metal halide, high-pressure sodium, or compact fluorescent lamps are preferred, and mercury vapor lamps are discouraged. Additionally, it should be recognized that simply increasing lamp wattage is not always the correct solution to a perceived lighting problem. Other factors such as light direction, light quality, surface reflectance, and contrast with surrounding areas can affect perceptions of security and character.



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- LOOP ROAD LIGHTING
- PRIMARY ENTRY LIGHTING
- SECONDARY ENTRY LIGHTING
- MAJOR PEDESTRIAN PATH LIGHTING
- SECONDARY PEDESTRIAN PATH LIGHTING
- LIGHT CONTROL ZONE
- FENCELINE
- CONTROLLED ACCESS GATE

Figure 6.5.5

Lighting Concept Plan

NIH / ORF / DFP

Oudens & Knoop, Architects, P.C.

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6.5.6 Utilities

Power Plant Expansion

According to the Master Utilities Plan and 2000 Update, the central Power Plant capacity must be expanded to meet future growth projections. Figure 6.5.6-a shows the Master Plan recommended guidelines for the Power Plant expansion. Future projected expansion includes Boiler 7, additional chillers/cooling towers, utility tunnels running to the ease and south of building 11, and possibly additional electric power facilities or substation. Steam generation facilities are located in the northern half of Building 11, chilled water in the southern section. Future Boiler 7 would be located on the north side of of Building 11 to the east of the COGEN facility. Additional space is available for other uses. Future expansion of the central refrigeration plant would be on the east side of Building 11. The MPW marshalling and storage functions in Building 25 , and the storage and maintenance functions in Building 22 and 22A, must be relocated before this eastward expansion can occur to allow adequate access to the Power Plant, the Master Plan proposes a service court on the north and south sides of the facility. The minimum recommended distance between the Power Plant and adjacent development is 110 feet to allow sufficient maneuvering room for large trucks and emergency equipment. Power Plant service areas should be screened on all sides by minimum eight foot high walls and landscaping. The south service yard is an important utility corridor that already has a high utility density, and this function will continue in the future. The Master Plan proposes this corridor as the potential route or alignment for major relocations of NIH stormwater and sanitary sewer trunk lines that are necessary for East Quad development.

The two existing 500,000 gallon distillate oil fuel tanks on the east side of Building 34 must be relocated prior to construction of the loop road in this area. The Master plan recommends replacing them with equivalent storage capacity on the south side of Building 11.

The Master Plan locates significant pedestrian paths at the west end of Building 11, requiring the relocation of loading functions to other sides of the facility. An expansion reserve area is planned for the east end of the complex, however, it should be set back substantially from Center Drive to avoid becoming an overwhelming mass on the entry side of the campus.

Utility Corridors

In all cases, new utility corridors should avoid existing buildings and development sites proposed by the Master Plan. As noted in Section 5.4.1, it is desired that utility corridors lie within roadways where possible. Excluding the proposed center median, the typical loop road condition allows for 40 feet of width for utility placement. Under more constrained conditions, the loop road section provides two ten to fourteen foot wide outside lanes below which utilities can be placed. This arrangement would allow at least one travel lane in each direction if repair access were needed. Additional utility lines could be placed outside of the roadway within a limited distance of the curb, leaving an easement to allow planting and walkways at the street edge. Figure 6.5.6-b shows the recommended allowable utility corridor areas ranked in their order of preference; first below the curb lane, second below the travel lane, and third outside of the roadway.

For utility systems design criteria, see the Master Utilities Plan, MUP 2000 Update, and Section 5.4 of the Master Plan 2003 update Environmental Impact statement.

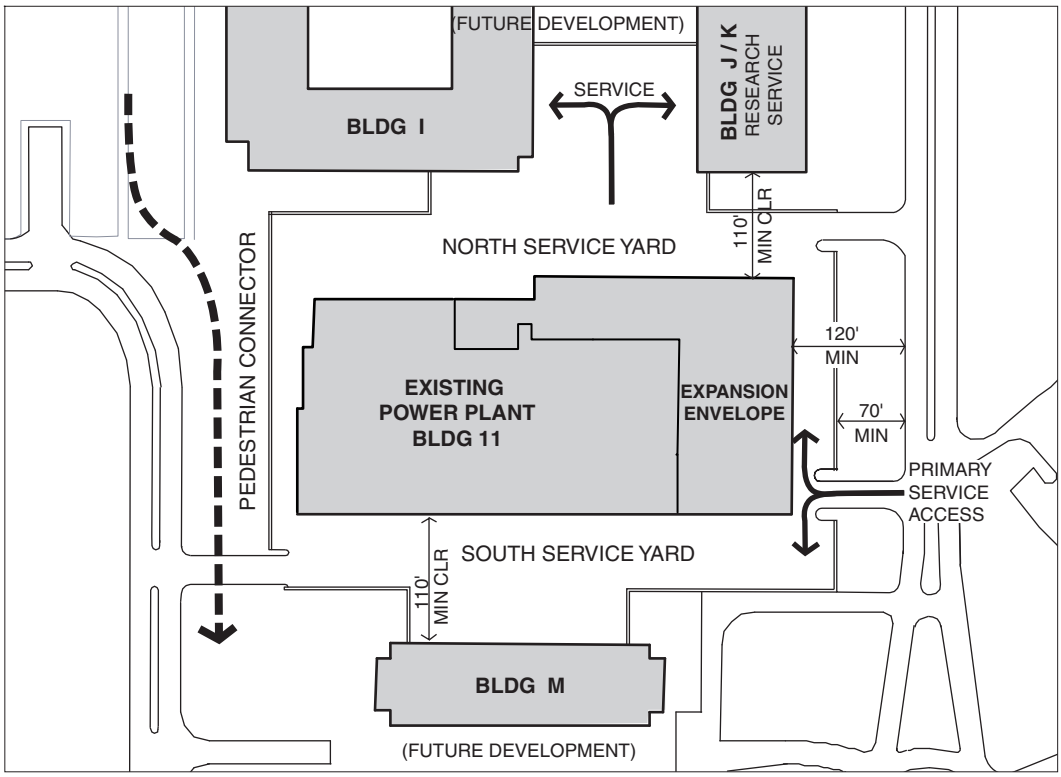

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Figure 6.5.6-a

Power Plant Expansion Guide

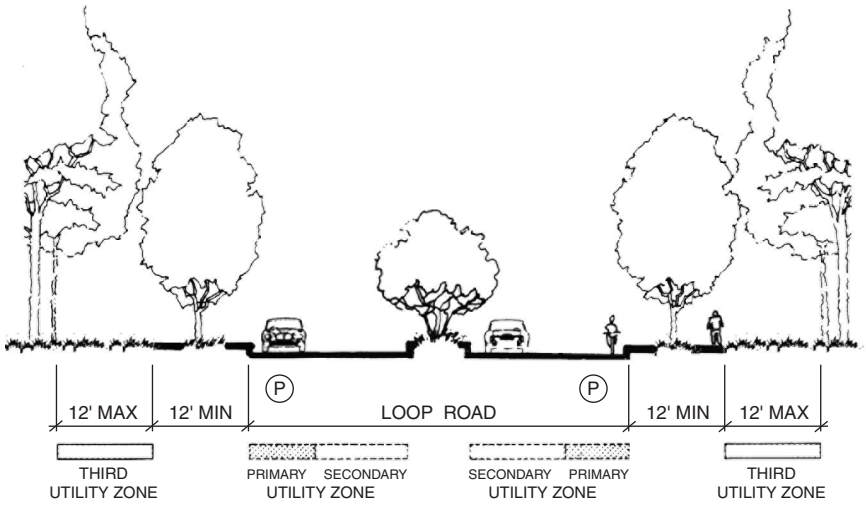

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Figure 6.5.6-b

Utility Corridor Section

6.6 Phasing

The following diagrams (Figures 6.6.1 through 6.6.4) and text describe the implementation of the Master Plan in five-year increments over the next twenty years. The purpose of the phasing analysis is to give guidance to the sequence of projects to be constructed on campus, to emphasize the priority of key developments, and to illustrate potential future development conflicts. Of particular importance is the development of a strategy to relocate or replace key functions to accommodate new construction in the central areas of the site closest to Metro access.

The phasing plan is based on a linear progression toward fulfilling the programmatic needs projected by the Master Plan. The actual growth and replacement rate on campus will depend on evolving national policy and budget decisions. The phasing illustrates issues and subsequent strategies affecting sequencing such as project priorities, replacement and demolition, and critical continuity of campus functions including services and infrastructure.

Establishing the framework and character of the campus is an important consideration. Priority should be given to implementation of projects, which define the key open spaces of the campus, such as the new lab building sites along the Central Mall. Emphasis should also be placed on projects which replace obsolete structures or which allow a more efficient use of land resources. The proposed Master Plan phasing can be summarized in five steps:

1. Construction of the Clinical Research Center (CRC);
2. Construction of Neuroscience Research Center (35/NRC) completing the West Quad research group;
3. Replacement of the Animal Facility and redevelopment of the Building 14/28 site for the South Quad research group;
4. Replacement of the Support and Computer Services facilities and redevelopment of the Building 12/13 site for the East Quad research group, and;
5. Completion of the Central Mall.

In each section, major activities are identified within a five-year period. At the end of each section a tabulation is given showing the total building area provided which corresponds with the building area target indicated in the Table of Bethesda Campus Growth set forth in Section 2.8.8. Square footage figures do not include structured parking areas.

First Phase Objectives and Relationships

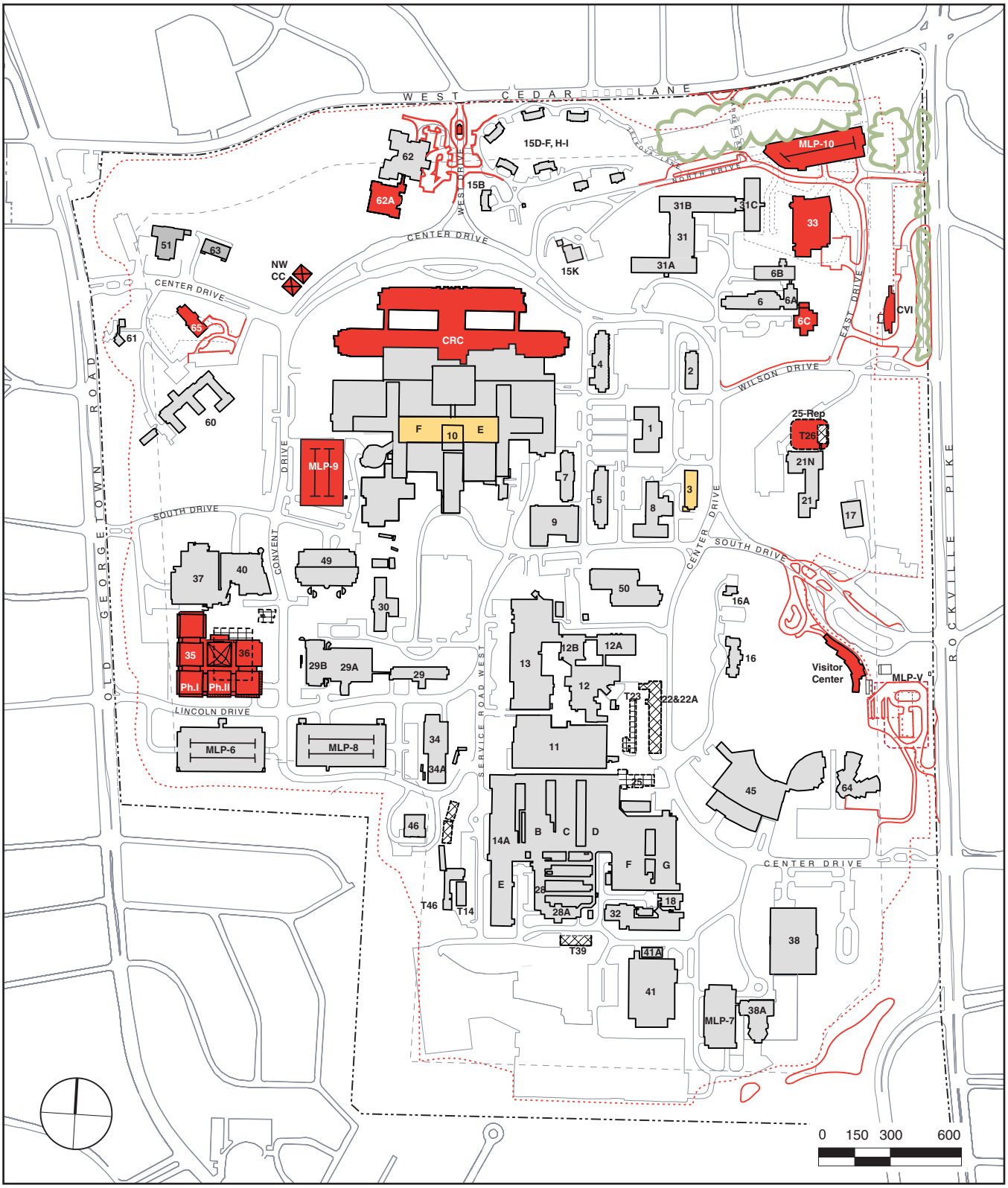
One of the greatest needs among NIH facilities is the timely upgrade of the Clinical Center Complex and completion of the Mark O. Hatfield Clinical Research Center (CRC), which is currently under construction. The Commercial Vehicle Inspection Facility (CVI) and the Gateway Center for visitors are also critical elements in the ongoing security improvements to the NIH facilities and campus environment as a whole.

To meet critical service needs due to the campus growth over the 20-year plan, projects proposed include expansions to the existing Power Plant (Building 11) throughout the implementation of the Master Plan. A new child care center at the northwest side of campus will be added to meet growing NIH child care needs.

Site character enhancements include the removal of buffer parking on the north and northeast sides of the campus, and enhancement of landscape screening to improve the buffer between NIH and adjacent neighborhoods along the south perimeter of the site. The new southeast pond will serve both to provide a parklike setting while providing storm water control.

Table 6.6.1 - First Phase

Existing Total GSF Area	**7,360,734**	**gsf**
Building 65 - Family Lodge	26,500	gsf
Building 62A - Childrens Expansion	34,000	gsf
Building 35 - Porter Neuroscience Research Center (NRC) - Phase I	265,000	gsf
Perimeter Fence + Gates		
Mark O. Hatfield Clinical Research Center (CRC)	1,050,000	gsf
MLP-10 - Multi-level parking at northeast corner of campus	0	gsf
replacing northeast buffer parking		
MLP - 9 - Multilevel Parking west of Clinical Center Complex	0	gsf
Remove remaining surface parking lots 31F and 31H	0	gsf
CVI - Commercial Vehicle Inspection Facility	3,719	gsf
Building 10 Stabilization - Patient Care Units, Floors 2-13, out-of-service	-297,756	gsf
Demolish Research Building 36	-236,285	gsf
Gateway Center (Visitor Center / Visitor Vehicle Inspection Station)	20,528	gsf
MLP-V - Gateway Center multi-level parking below grade	0	gsf
Research Builing 33	150,000	gsf
Building 6C - Addition to Building 6	16,500	gsf
Building 10 upgrades - no additional space	0	gsf
Building 35 - Porter Neuroscience Research Center (NRC) - Phase II	335,000	gsf
including West Quad landscape improvements		
Building 10 Central Core Project, Transition Program and Penthouse	49,227	gsf
Complete renovation of Building 3	0	gsf
Reassign Research Buildings 29A &29B	0	gsf
Renovate Building 10E&F Wings and North Corridor	-147,000	gsf
NWCC - Northwest Child Care Center	21,000	gsf
Demolish T-39 Fitness Center*	-5,160	gsf
25 Rep - Construct Replacement for Building 25 near Building 21	12,000	gsf
Demolish Building 22, 22A and 25	-20,255	gsf
Demolish Building T-23 and T-2	-5,871	gsf
Proposed Southeast stormwater management pond	0	gsf
Master Plan Development - Period sub-total	**1,274,147**	**gsf**
Cumulative subtotal end of First Phase	**8,634,881**	**gsf**



NIH Master Plan 2003 Update

Bethesda Campus

- EXISTING BUILDING
- NEW CONSTRUCTION
- MAJOR RENOVATION
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Figure 6.6.1

Phasing Plan First Phase

Second Phase Objectives and Relationships

The major objective of this time period is the clearing of the Building 14/28 site for the future South Quad research development. To accommodate the demolition of the existing Animal Facility, which is considered obsolete, the ARC (Animal Research Center) must first be constructed. Construction of the south portion of the loop road should also be completed to improve internal access to this area of the site. The ARC would be the first research building in the South Quad to be constructed, and Research N would follow.

The Medical Pathological Waste (MPW) marshalling and management facilities located in Building 25 must be relocated to make room for any Phase III expansion of the central chilled water plant on the east side of Building 11. Building 25 operations would be moved to a new facility. For purposes of this Master Plan, the relocation of Building 25 is shown in the vicinity of Buildings 21 and T-26, allowing campus facilities for MPW, hazardous, and radioactive waste to be consolidated in one location. If required, the relocation could be done in conjunction with any upgrade or renovation of existing facilities in Buildings 21 and 21N at the site. Many regulatory requirements are involved in siting waste management facilities. Therefore, additional studies of potential relocation sites for Building 25 and details in the arrangement and orientation of facilities would be developed at the time of project implementation. The Master Plan only designates a generalized "site" or area for the Building 25 replacement (25-Rep) to indicate the recommended relocation of the MPW facilities to the Building 21 area. The generalized "site" could be extended to cover the entire Building 21 complex, if that building is involved in improvements at the time of the Building 25 relocation.

Site character enhancements for this phase include landscape/streetscape improvements near the Convent Building (Building 60) and in the Historic Core area. Upgrades are also proposed for the central east-west pedestrian walkway through the campus, along with construction of the amphitheater to help define the center of the campus as a gathering place. The second phase of multi-level parking E is at the south side of the ARC, to accommodate growing population needs. The remaining paved surface south of MLP-E is to be turned into landscape, screening the parking structure.

Table 6.6.2 - Second Phase

Cumulative sub-total end of First Phase	**8,634,881**	**gsf**
ARC - Animal Research Center	335,000	gsf
Demolish Buildings 14/28, 18, 32	-288,071	gsf
Southern Loop Road	0	gsf
Reseach Building M, South Quad	178,500	
Building 11 Phase III eastward Expansion (Boiler 7; Chillers 26-29)	35,000	gsf
Building 40 - Vaccine Research Center - Phase II	50,000	gsf
Research Building N, South Quad	137,700	gsf
MLP C - Multi-level parkingbelow grade at South Quad	0	gsf
Building 10, Reoccupy E & F Wings	444,756	gsf
Remove Portions of South Surface Parking Lot 41B/T1 and 41C	0	gsf
MLP E - Phase I	0	gsf
Demolish Building 10A	-56,000	gsf
Demolish MLP-7	0	gsf
Building R - Addition to the National Library of Medicine	389,370	gsf
Demolish 12, 12A, 12B making wat for East Quad	-156,236	gsf
MLP E - Phase II	0	gsf
Surface parking removal from South buffer and landscape improvements	0	gsf
Research Building P, South Quad	183,600	gsf
Remove Portions of South Surface Parking Lot 41B and 41C	0	
Reassign Building 34/34A (Campus Center)	0	gsf
Master Plan Development - Period sub-total	**1,253,619**	**gsf**
Cumulative subtotal end of Second Phase	**9,888,500**	**gsf**

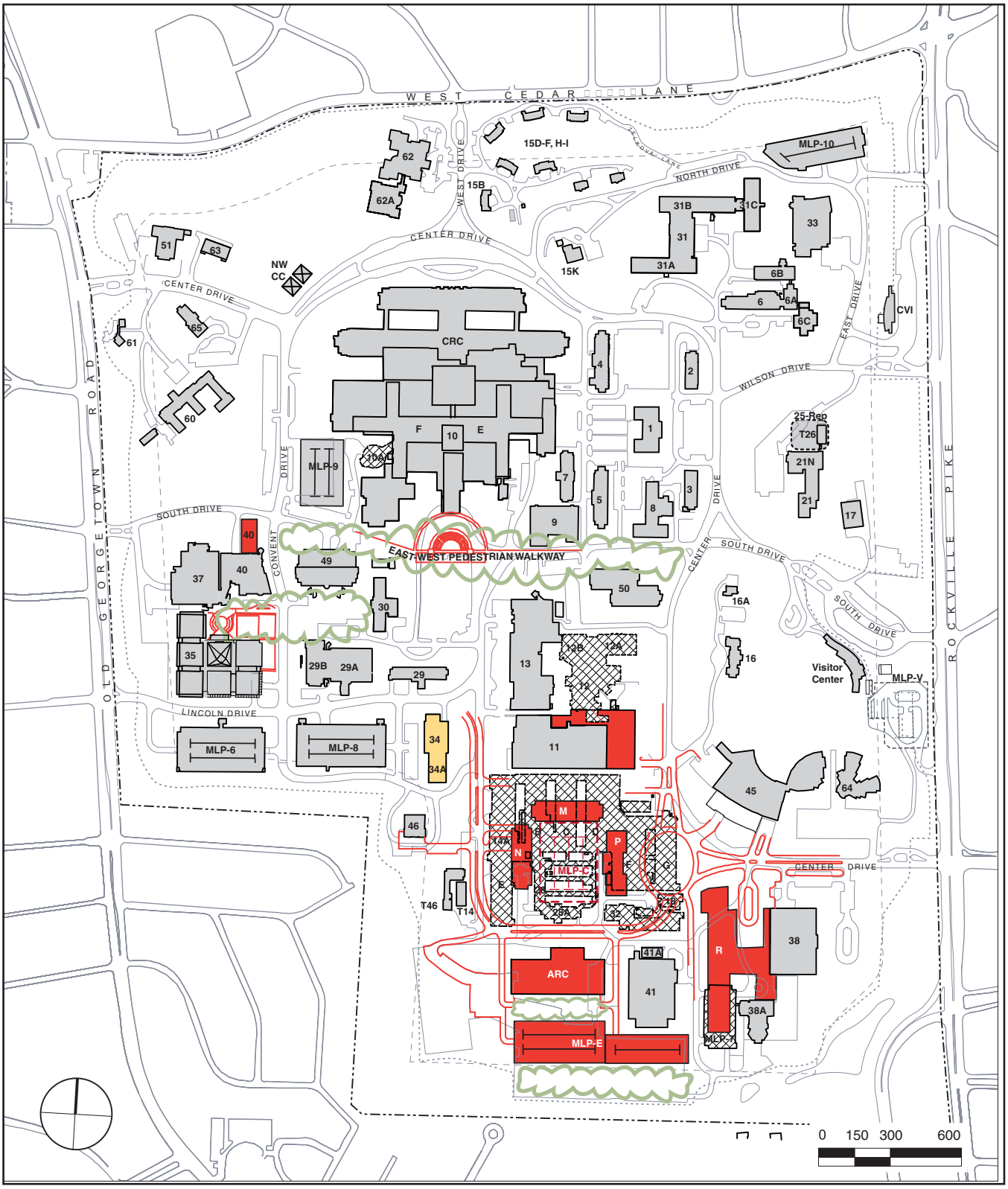

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Figure 6.6.2

Phasing Plan Second Phase

NIH / ORF / DFP

Oudens & Knoop, Architects, P.C.

SmithGroup

Third Phase Objectives and Relationships

One major objective of this phase is the redevelopment of the central portion of campus for proximity both to the Clinical Center and Metro of more dense development. Research Building I and Research Service Building J/K are proposed to be built on the former building 12/13 site. Outdated buildings 29 and 30 are proposed to be replaced with modern research Buildings F and G.

Another major objective is the completion of the Central Mall as the heart of the campus. With the enclosure edges provided by Buildings F, G, and I, the interior landscaping can be completed. The campus center proposed as part of an adaptive reuse of Building 34/34A will be the focal point at the south end of the Mall.

The South Quad research development will get finalized with the construction of labs M and P and by landscaping the plaza above MLP-C.

To accommodate projected campus population growth, construction of MLP-D below the Central Mall is proposed, along with upgrades to the east and west section of the loop road.

Table 6.6.3 - Third Phase

Cumulative sub-total end of Second Phase	**9,888,500**	**gsf**
Demolish Building 29	-89,949	gsf
MLP D, Central Mall Parking	0	gsf
Demolish Research Building 7 and 9	-81,360	gsf
Central Mall	0	
Building J/K - Research Services	212,175	gsf
Demolish Building 13	-212,690	gsf
Demolish T14	-4,000	gsf
Demolish T46 - Child Care Center	-3,000	gsf
Demolish Research Building 30	-93,940	gsf
Research Building I	249,900	gsf
Research Building G	112,200	gsf
Research Building F	149,600	gsf
Master Plan Development - Period sub-total	**238,936**	**gsf**
Cumulative subtotal end of Second Phase	**10,127,436**	**gsf**

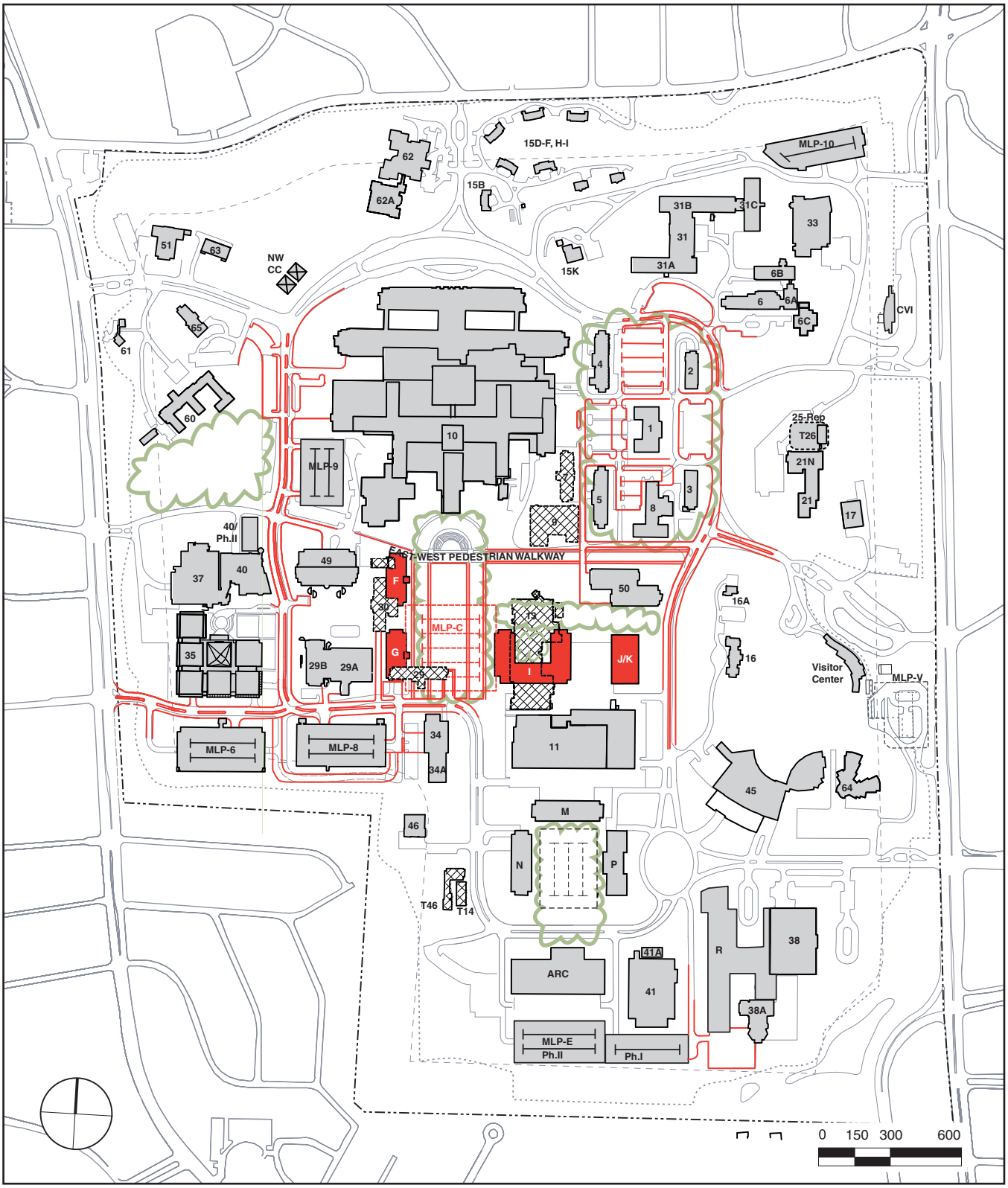

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Figure 6.6.3

Phasing Plan Third Phase

Final Phase Objectives and Relationships

The objective of this phase is the decompression of existing research buildings, to allow for an efficient and appropriate ratio of gross square feet per employee. Included in the final phase development, is proposed Building Q which will be an eastward extension of the Natcher Building containing administrative and office space.

Table 6.6.4 - Final Phase

Cumulative sub-total end of Third Phase	**10,127,436**	**gsf**
Remove Surface Parking Lot 45 (Natcher)	0	gsf
Office Building Q (Natcher Addition)	190,000	gsf
Research Building D	168,700	gsf
Research Building H (includes decompression of existing Research Buildings)	229,500	
Master Plan Development - Period sub-total	**238,936**	**gsf**
Cumulative subtotal end of Second Phase	**10,127,436**	**gsf**

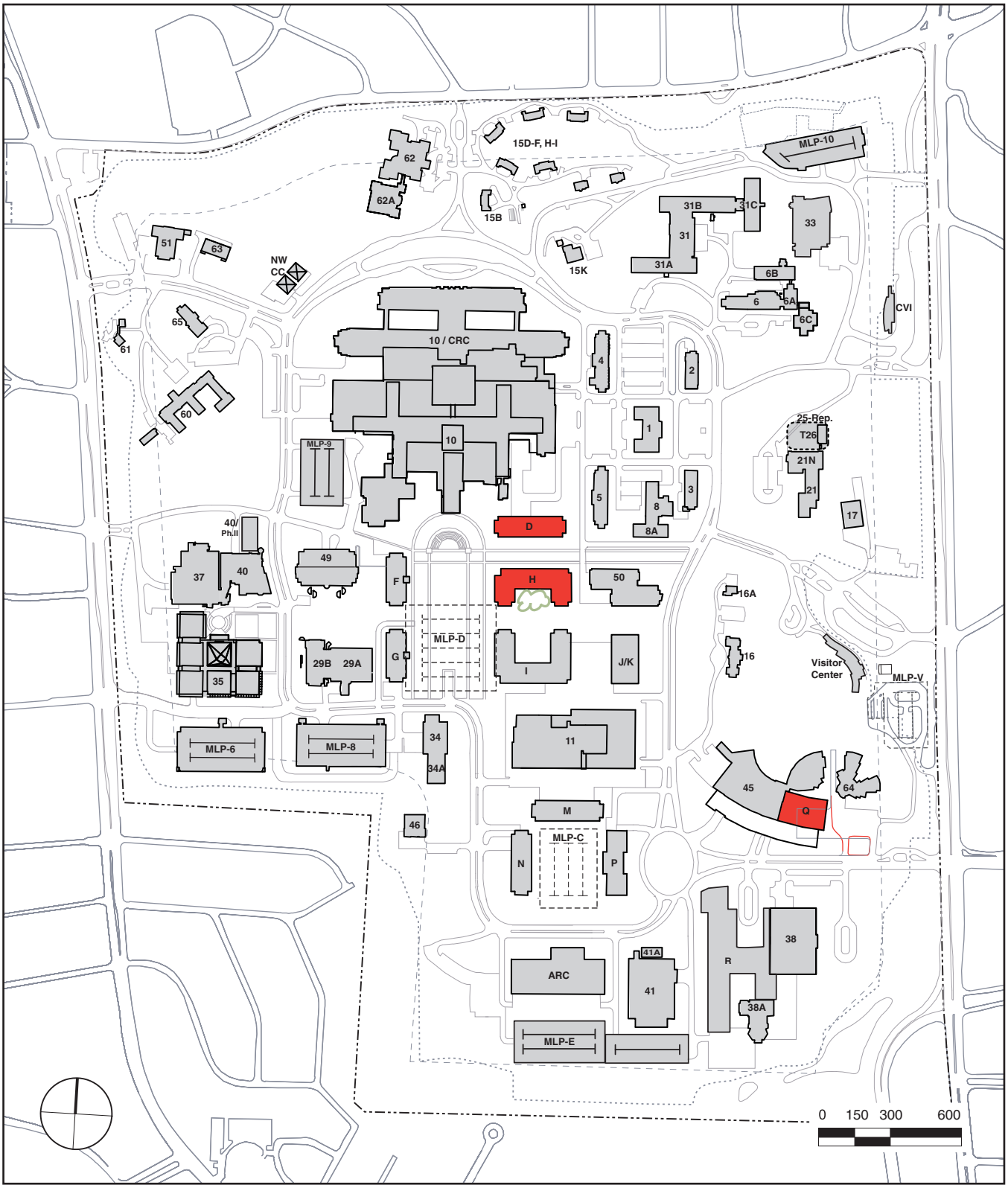

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Figure 6.6.4

Phasing Plan
Final Phase

NIH / ORF / DFP

Oudens & Knoop, Architects, P.C.

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6.7 Transportation Management

6.7.1 Background

The National Institutes of Health has an ongoing Transportation Management Plan (TMP) with the objective of reducing peak hour vehicular traffic by encouraging NIH employees who drive alone to ride share, use public transportation or use other alternative modes or alternative work scheduling. The TMP is an important element of the transportation component of the Master Plan because it defines policies and programs that influence the design of the transportation and parking systems at NIH.

Maintaining the transportation management plan as part of NIH administrative responsibilities is mandated in a Memorandum of Understanding (MOU) signed by the NIH, the Montgomery County Planning Board (MCPB), and the National Capital Planning Commission (NCPC) in May 1992. The MOU defined an agreement among these three agencies that:

1. the signatories will meet a minimum of two times per year to discuss NIH issues affecting NIH transportation;
2. the NIH commits to best faith efforts to meet its TMP and to seek funding for it; further, the NIH will monitor the success of the TMP with semi-annual traffic counts and annual evaluations;
3. the NIH will assess its parking needs and attempt to reduce its future parking demand to the extent practical;
4. NCPC and MCPB will evaluate future employment and parking in light of the NIH's success in implementing the TMP, and;
5. the NIH will implement other measures if current strategies prove unsuccessful.

The addendum to the MOU lists three goals for the TMP and a series of short-term and long-term strategies. These goals and strategies have provided guidance for the TMP activities, which the NIH has been carrying out, and for the Master Plan. The goals of the 1992 MOU TMP are as follows:

1. ***Improve the availability of parking spaces on campus for NIH personnel and visitors.*** (Note that one of the long-term strategies is to maintain the parking supply at the NIH at no greater than 0.5 parking spaces per NIH employee, consistent with the NCPC Comprehensive Plan for the National Capital, Federal Elements, Federal Parking Policies, 5.b and Diagram 4, plus additional parking spaces to serve the needs of visitors and patients. Additionally, NCPC has asked the NIH to reduce its employee parking supply below the 0.5 parking spaces per employee ratio.)
2. ***Mitigate the traffic impacts of future campus development on the roadways serving the NIH campus, such that the level of congestion is made no worse than if such development did not occur.*** (This means that NIH traffic should have no net impact on traffic conditions as compared with conditions, which would prevail if there were no growth. This has been interpreted into very specific criteria used in the impact analysis for the Master Plan.)
3. ***Maintain a "good neighbor" relationship with the surrounding community.*** (the NIH has established Community Liaison Council to air issues, including transportation and parking. From the standpoint of traffic and parking, the Master Plan and EIS mitigation measures define actions to reduce the NIH's traffic and parking impact on adjacent neighborhoods.)

For many years prior to the MOU, the NIH administration had engaged in efforts to manage its traffic and parking. This included provision of shuttle buses on campus to encourage employees and visitors to use Metrorail, Metrobus and Ride-On bus to

access the campus. Shuttle buses have been provided so that trips between NIH facilities can be made without use of a personal automobile. Shuttle routes have also been provided between NIH locally leased properties and the Bethesda Campus, as well as between the main campus and satellite parking, to reduce demand for on-campus parking and/or vehicle trips to campus.

In addition to these efforts, the NIH has developed a telecommuting pilot program in which a number of employees work at home several days each week, and communicate with their offices using telephone, computer, and modem.

The following table offers a comparison of various factors relating to and influencing NIH-related traffic, both at the time of the 1995 Master Plan and at present:

	1995	2003
Number of Employees	16,500	17,511
Total Daily AM Peak Hour Trip Generation	5,242	4,190
Total Daily PM Peak Hour Trip Generation	5,138	3,159
Total Number of Parking Spaces	10,500	9,356
Number of Employee Transhare Participants	1,923	4,422

The above table shows several significant differences in the NIH's AM and PM daily trip generation and employee modal choice between 1995 and 2003. The above differences indicate that the TMP adopted as part of the 1995 Master Plan was successful in reducing peak hour traffic volumes and encouraging greater use of transit by employees. As a result, the current TMP seeks to build upon the NIH's success over the last five years in minimizing the NIH's traffic impacts, and continue to serve as a cornerstone for the NIH's transportation policy.

6.7.2 Ongoing TMP

In October 1991, the NIH created an Employee Transportation Services Office (ETSO), and staffed a position with the responsibility of coordinating Transportation Management Plan efforts.

In general, it is the responsibility of the ETSO to work with other administrative staff to monitor the effectiveness of existing NIH programs and adjust these programs to make them more effective. The ETSO also currently works as part of a NIH/Naval Medical Center/Suburban Hospital/Montgomery County DPW&T working group. It also works in conjunction with the local community and the North Bethesda Transportation Management District, to coordinate the NIH's transportation management program with the other member groups' TMP programs. The ETSO is a member of the Association of Commuter Transportation (ACT), which works with employers throughout various cities, and local and state agencies, to share alternative commuting ideas and strategies, and to promote these alternative transportation modes to organization member employees. On a daily basis, ETSO's Transportation Information Office provides NIH employees and visitors with public bus route and schedule information, including Metro, MARC, VRE, and MTA. In the future, the ETSO will continue to research new programs, and test and implement them if they prove to be effective.

The current efforts of the NIH ETSO include programs to encourage ride-sharing, use of public transportation, and use of private NIH park-and-ride facilities and services. The following list details each of the current NIH Transportation Management Plan's programs and features:

- NIH Transhare Program – This program was established in 1992 and originally provided employees a subsidy of $21.00 per month. As budgets permitted, the amount of subsidy and level of participation continued to rise. This program currently provides 4,422 employees a monthly subsidy of up to $100.00 for using public transportation. In exchange for program participation, NIH employees must surrender all parking permits and privileges for use of on and off-campus parking areas.
- NIH Carpool Program – This program allows employees to utilize strategically located "carpool" parking spaces that are located in close proximity to many potential on-campus destinations. The carpool spaces are reserved for employees with carpool permits until 9:30 A.M. Two or more people may participate in the program and each individual carpool member must surrender their individual "general" parking permit. There are currently 380 registered carpools (accounting for 760 NIH employees) on the NIH campus.
- NIH Vanpool Program – This program allows a group of employees to obtain an individually reserved space in the lot of their choice for a van. Vanpoolers (10 vanpools with 150 NIH employees) are eligible to participate in the NIH Transhare Program to subsidize their commuting cost(s).
- NIH Ridematching Program – Employees are provided with a list of other available people who are also looking to participate in the program from similar geographic areas. These lists are usually provided to employees within two business days of the request. The NIH ETSO is very active in promoting and facilitating this program through the maintenance of an accurate database listing of all of the participants. In conjunction with the Ridematching Program, the NIH also participates in the Washington Metropolitan Council of Governments "Commuter Connections" Program.
- MWCOG Guaranteed Ride Home Program – the NIH participates in this program, which is also sponsored by the Metropolitan Washington Council of Governments (MWCOG). The program ensures commuters who regularly carpool, vanpool, bike, walk, or take transit to work with a reliable ride home when they need to work overtime or in the event another unexpected reason to leave work arises. The ride, using a taxi or other transit, is free to the user.
- NIH Alternative Work Schedule Program – NIH offers an alternative work schedule program, which allows some NIH employees the opportunity to work one additional hour each day in order to receive one additional day off from work every two weeks.
- NIH Telecommuter Work Program – The NIH Telework Program enables eligible NIH employees to reduce or eliminate their commutes by working part-time or full-time from a remote location, including their home, a telework center, or some other approved site. "Telework", which is also known as "telecommuting", is a management tool that is designed to help organizations and individual's function more effectively and efficiently, as well as recruit and retain qualified employees. Long-term telework can be integrated into space planning and can also have a beneficial impact on the community and the environment by reducing site-generated traffic.
- NIH Shuttle System – the NIH has its own comprehensive shuttle system, which provides regular service to the whole campus and to all of its off-campus work locations. The shuttle system consists of seven routes, with one route serving just the campus as a "loop" route; the "loop" route runs with 10-minute headways while the other routes have headways which vary by route. The campus contains thirteen stops, which are all in close proximity to the buildings. Approximately 3,400 employees use this service during the workday. Several shuttle routes operate from 6:30 a.m. to well past midnight. After normal route times, the shuttle

operates as an escort service to transport employees to their vehicles. Three of the NIH Shuttle stops serve as transfer locations to other shuttle routes and the Montgomery County Ride-On and WMATA Metrobus systems. One of the transfer locations is located at the Medical Center Metrorail station located on campus, where a rider may transfer to the Metrorail, Metrobus, or Ride-On bus systems.

- NIH Express Bus Routes – the NIH has worked with MCDPW&T, NNMC, and Suburban Hospital to implement several express bus routes which link the Bethesda Campus directly to the Milestone Park & Ride Lot in Germantown, MD, the Lakeforest Park & Ride Lot in Gaithersburg, MD, Tyson's Corner in Virginia, and the New Carrollton Metro Station in Prince George's County, MD. These express buses operate during the morning and evening rush periods.
- Off-Campus NIH Satellite Parking – There are currently 575 spaces available to NIH employees at off-campus, satellite locations. The satellite spaces are located in lots strategically located at Metrorail stations or close to NIH employment centers. Employees can park for free at these locations and then either ride Metrorail or an NIH shuttle bus to the campus, depending upon the location.
- NIH Construction Contractor Parking – NIH requires construction contractors to park in off-campus locations. There are currently 150 off-site spaces provided for construction contractor parking, and NIH operates a dedicated construction employee shuttle during the morning and evening rush periods, between the off-site parking and NIH campus. These shuttles do not travel on residential streets.
- Managed NIH Parking Facilities – For those employees who must drive to work, a parking management company has been utilized to assist in parking employees and visitors to the NIH campus. This allows for increased efficiency in the utilization of several parking facilities on campus, and results in more overall campus parking capacity. The managed parking also discourages illegal or lengthy parking and enhances the security of the parking areas.
- NIH/NNMC/Suburban Hospital Working Group – This group meets quarterly and on an "as needed" basis to review transportation issues which affect the three institutions in a coordinated manner. This group was instrumental in the establishment of the numerous express bus services between the NIH local area and Virginia, Montgomery County, and Prince George's County.
- Paid NIH Visitor Parking – the NIH has implemented paid visitor parking on the Bethesda Campus to
  discourage non-visitors from parking in visitor parking spaces on-campus.
- Information and Communication Systems – the NIH is developing enhanced transportation systems information for employees and visitors to provide greater opportunity for them to choose the best transportation and parking alternatives for their commute and trip to the campus. These systems include the following:
  - o Official NIH Website – the NIH provides updated parking, transit, and transportation demand management (TDM) information to employees and visitors to promote awareness of our robust TDM plan and parking/transportation system.
  - o Highway Advisory Radio (Emergency Broadcast System). The NIH installed and operates a Highway Advisory Radio (HAR) system on the campus. At the present time, this system is used to provide information regarding current facility and operational status and situations, and to inform them of upcoming changes in the parking and traffic facilities.
  - o Real-time Bus Arrival Forecasts. The NIH has contracted to install this system that will provide "real-time" shuttle arrival information to shuttle users at on-campus shuttle stops through the use of electronic signs.
  - o Personal Digital Assistant Access to the Website. The NIH has developed the capability for employees to access information on the Website using Blackberry PDA's.
- NIH Employee Education/Promotional Events – The NIH ETSO is proactive in

stressing the importance of using transit and participating in other alternative transportation programs to NIH employees. One way the TSO educates new NIH employees about commuting options is through the monthly employee orientation programs. The ETSO also holds NIH Commuter Transportation Fairs. At each of these events, many vendors are present and provide NIH employees with numerous commuting options (vanpool, carpool, transit, commuter buses, Guaranteed Ride Home Program, bicycling, etc.)

Monitoring the effectiveness of existing programs is a continuing activity on which the NIH ETSO office will report on a regular basis to the MCPB and the NCPC as part of its MOU commitment. The first results of these monitoring efforts were obtained in May 1993 when comprehensive traffic counts were conducted at all eleven NIH entrances. These traffic data were compared with 1992 surveys to determine the relative level of change in total campus trip generation during the morning and evening peak hour and for the three-hour peak periods in both the morning and evening.

The results of this monitoring work, which is continued every 6 months, are presented in the Traffic Monitoring Program Current Condition Surveys, the National Institutes of Health, Bethesda, Maryland, by Gorove/Slade Associates, Inc. Washington D.C. The principal finding of the most recent study is that the rate of vehicle trip generation and the absolute number of peak period vehicle trips generated at the NIH Bethesda Campus, has declined from 1992 to 2003 by approximately 33% during the AM peak hour and 45% during the PM peak hour. Thus, the MOU agreement and the effectiveness objectives of the TMP are being satisfied.

6.7.3 Future TMP Goals and Activity

Memorandum Of Understanding

Trip Generation

A primary goal of the NIH TMP is to mitigate traffic impacts such that the level of congestion is made no worse. This has been interpreted in this Master Plan 2003 Update to be a goal of reducing the rate of vehicular trip generation per employee such that growth in employment does not generate peak hour vehicular traffic which would exceed the ceiling for peak hour trip generation set by the MOU and established by the 1992 traffic counts conducted at NIH. This ceiling and the goals for the NIH TMP are calculated as follows:

The NIH has committed to not generate more peak hour trips than what prevailed at the time the Memorandum of Understanding was signed in May 1992. On this basis, a site generation limitation of 5,888 AM peak hour trips and 5,772 PM peak hour trips was established.

The October 2003 traffic-monitoring program revealed that NIH was currently generating 4,190 AM peak hour trips and 3,159 PM peak hour trips. Thus, NIH's current trip generation rates are significantly below the MOU rates by 1,698AM peak hour trips and 2,613 PM peak hour trips, through TMP measures that have been enacted since 1992.

If the main campus employee population grows as estimated (approximately an additional 4,500 (26%) employees to an approximate total of 22,000), trip generation would theoretically by 1,074 AM NIH peak hour trips and 810 PM NIH peak hour trips, using a straight-line extrapolation. Therefore, the total AM NIH peak hour trips of 5,264

and the total PM NIH peak hour trip of 3,969 will still be below the MOU-based limits of 5,888 AM peak hour trips and 5,772 PM peak hour trips.

6.7.4 Future TMP Activities

As part of the Master Plan process, a broad range of enhancements to the current TMP have been identified, which are considered to have a potential for effectiveness in meeting TMP objectives. These candidate programs have been screened in an open forum discussion among those NIH offices now responsible for transportation and parking. Furthermore, preliminary screening of candidate program enhancement has been made based on estimates of their potential cost and range of likely effectiveness. Coupled with these efforts, more effective techniques for monitoring TMP programs are being reviewed and will be implemented. In addition to maintaining and continually striving to improve all of the existing TMP programs, specific additional enhancements to the current TMP which are being considered are as follows:

1. Expand the use of managed parking.
   Rationale: Managed parking gives NIH the flexibility to provide adequate parking at times when demand exceeds self-park capacity, especially when construction projects cause NIH to close down part of the campus parking supply. The managed parking also discourages illegal parking and enhances the security of the parking areas.
2. Restructure routings of transit services and waiting areas on campus to establish a transportation center from which all services emanate, possibly located at the new Clinical Research Center or new NIH Gateway Center for Visitors. Consider providing a permanent taxi-stand at such a location that might be the base for Emergency Ride Home (ERH) services.
   Rationale: A central transportation terminal may be a more efficient means of delivering services and communicating service information to employees. Possibly relocate the Transportation Information Office there.
3. Work with county to discourage illegal parking in nearby residential neighborhoods, including NIH contractors and construction workers.
   Rationale: Unless county parking restrictions in the adjacent neighborhoods are regularly enforced, nearby neighborhoods will remain attractive to NIH visitors and contractors who wish to avoid parking fees.
4. Initiate further promotional and marketing activities for transit, such as services similar to those employed by Transportation Management Associations. For example, arrange discounts with Bethesda CBD merchants and restaurants (through the Chamber of Commerce or the Bethesda Urban Partnership) for Transhare participants and car/vanpoolers.
   Rationale: In addition to providing Metrochecks at The Recreation and Welfare (R & W) Store, additional marketing of services can be conducted, through The R & W Store in order to provide further inducements to encourage transit use by employees. Chamber members could benefit by using this as an opportunity to increase business. While not the deciding factor to utilize other modes, popular merchandise and other discounts will contribute to the attraction of the alternative modes.
5. Seek to ensure good transportation linkages between new campus construction, especially for office buildings, to the Metrorail station, NIH Gateway Center, and/or to a new transportation center.
   Rationale: A pleasant walking experience between office facilities and transit modes is a substantial inducement for transit use.
6. Employee Education. Continue to expand the ETSO's educational effort with top NIH management and campus personnel stressing the benefits of alternative transportation. This would include posting detailed information regarding bicycle routes located throughout the Washington Metropolitan area, on the NIH

website. Easily accessible bicycle route information would aid bicyclists in traveling to/from the Bethesda campus from off-site locations, and may encourage employees who are unfamiliar with the existing metropolitan area bicycle route system to bicycle to/from the Bethesda campus.

7. Increase the number of employee carpools
   Rationale: A much more intensive marketing of this transportation demand management measure to NIH employees would reduce the amount of NIH-related single occupant vehicles (SOVs).
8. Conduct Annual Employee Transportation Surveys
   Rationale: Annual transportation surveys given to NIH employees would allow the ETSO to better monitor employee transportation needs on a more continual basis and suggest changes to the NIH Transportation Demand Management (TDM) program to maintain the TDM program's relevance and effectiveness.
9. Review and Enhance Current Telework Program Policy
   Rationale: When revised and fully implemented, the revised program policy will lower existing barriers to telecommuting, and enable managers and employees to integrate telecommuting more effectively into their organizations and further reduce commute traffic.
10. Increase Transhare
    Rationale: A much more intensive marketing of this transportation demand management measure to NIH employees would reduce the amount of NIH-related single occupant vehicles SOVs.
11. Parking Reduction. The following recommendations have been made regarding the reduction of parking at NIH and may be repetitive to the previously mentioned enhancements to the current TMP:
    - Maintain parking at 0.50 spaces per worker plus 97 additional spaces for visitors and patients by the year 2020. This parking ratio would be achieved through the maintenance of existing TMP measures, an adequate on-campus parking inventory, and incentives resulting in a measurable success in parking demand reduction. It would be contingent on the continued funding for the TMP (such as NIH TRANSHARE subsidy program, satellite parking). Federal legislation which would require NIH to charge visitors and/or employees for parking while allowing NIH to retain the revenues to cover operating expenses and subsidize additional TMP measures could expedite the achievement of the reduction of a lower employee-parking ratio.
    - Continue to encourage NIH employees to utilize transit and ridesharing in an effort to minimize NIH's trip generation during peak periods.
    - Continue to implement pedestrian- and bicycle-friendly recommendations of the NIH Master Plan 2003 Update, including the construction of more pedestrian and bicycle paths throughout the campus, and ensuring more secure bicycle storage provision
    - Continue to expand Alternative Work Schedule (AWS) to a more evenly distributed 5-day program utilization
    - Continue to expand telecommuting programs
    - Increase NIH TRANSHARE, and continue to explore subsidies for other modes: carpools/vanpools, bicycle, walking. Explore subsidies for NIH visitors, contractors, patients, and volunteers, which are not available under current law.
12. Study potential for enhancements to NIH Transportation Information and Communications Systems.

The NIH will monitor the information needs of its employees and study additional communications systems that could provide additional opportunities to improve their commute trip-making alternatives. For example, it would be desirable to communicate with employees who are already in transit either in private automobiles or on public transportation. Technology is available to accomplish this using off-campus highway advisory radio or variable message signs, "reverse 911" cellphone communications, audible wireless voice messaging, and other telecommunications technologies. This

could alert commuters to specific conditions on the campus that may adversely impact their commute. It is anticipated that in the event of a traffic event such as an accident, change in the "Threat Level by the Department of Homeland Security", or some other type of emergency, motorists could be channeled to alternate NIH entrances/exits for an orderly arrival or departure, which will minimize traffic problems on major roadways leading to and from the campus. Also, the NIH is examining technology that would provide employees with real time information regarding occupancy of the on-campus parking facilities.

In August 2004, NCPC published an update of the 1989 Comprehensive Plan for the National Capital Region. The updated Comprehensive Plan changed the parking space per employee ration goal applicable to the NIH Bethesda campus from one space per two employees (0.50) to one per three employees (0.33).

This change occurred a few weeks before the Draft NIH Bethesda Master Plan 2003 Update went to press for publication. The Draft Master Plan Update and Environmental Impact Statement (EIS) are closely integrated with one another. A change in one document generally requires a change in the other. Development of the Draft Master Plan Update and Draft EIS was predicated on the 0.50 space per employee parking ratio indicated in the 1989 Comprehensive Plan, with a long term goal of 0.45. Changes to the draft documents to account for an 0.33 parking ratio goal would require a major replanning and environmental analysis effort.

NIH believes the 0.33 employee parking ration goal is unrealistically low. To resolve the situation, and based on consultation with NCPC during the draft document review process, NIH will complete an analysis or revised TMP during the next year to establish a new, mutually agreeable, employee parking ratio goal for the Bethesda campus in accordance with the NCPC 2004 Comprehensive Plan.

Practical changes in the parking goal and traffic conditions can start with the completion of an approved revised TMP. However, the long range 0.45 and 0.50 parking ratio goals have been retained throughout the Master Plan 2003 Update and Final EIS to remedy the need for extensive document changes. It is NIH policy to update the campus Master Plan every five years. Changes accounting for the new parking ratio goal as determined by the TMP, will be incorporated in the next Master Plan Update.

6.7.6 Conclusions

This section has outlined the principal goals of the NIH Master Plan TMP and the recommended activities to attain these goals. The analysis indicates that the goals may be reached to differing degrees with shifts in the mode choice distribution by 2020. By achieving these shifts:

- The MOU impact goal will be met since the peak hour trip generation of NIH will not exceed 1992 levels.
- The NIH will manage its parking supply so as to not exceed a parking ratio of 0.50 spaces per employee. As a result, the parking supply for employees can equal 11,012 spaces in 2020 to comply with NCPC guidelines.