

Section Four

Alternatives Including the Proposed Action

4.1 INTRODUCTION

The Master Plan has progressively evolved in a continuous planning process from initial Institute and Center (IC) estimates of NIH Bethesda personnel and space needs made in 1993, through development of the 1995 Master Plan and its 1999 Northwest Sector Amendment, and subsequently, the NIH Bethesda Master Plan 2003 Update. The initial step was identification of site constraints and conditions. Site planning principles were generated to guide the planning process and eventual site development. Subsequent steps in 1993 consisted of the advancement of six general concepts or schemes as a framework for planning, and the selection and refinement of two of these concepts, the “Olmstedian” and “Quad-Mall” schemes, as preliminary alternatives. The best features of these preliminary alternatives were then merged or combined to produce the 1993 Draft Master Plan Alternative based on an ultimate campus population of 22,900 based on extensive interviews with Institute directors who made estimates of future program requirements.

After publication of the 1993 Draft Master Plan, two broad shifts in planning premises occurred. The first involved the general character and operations of the federal government. Increased emphasis was placed on reducing expenditures and downsizing facilities and personnel. In the 1995 Master Plan, within this context, long term or twenty year campus population projections were therefore reduced from the 22,900 given in the 1993 Draft Master Plan to about 18,000, or 10 percent over the 1993 employee population of 16,325. The 1995 Master Plan was based on a decline the campus population to about 15,000 by 2000, when moderate growth would begin. The planned 2005 population was about 16,000, still less than in 1993.

The second principal shift in planning premises occurred in 1994. At the request of Congress, an External Advisory Committee reviewed the NIH intramural research program. The committee recommended changes in research policies, procedures, and most importantly, Clinical Center renewal proposals in the downsizing framework. Rather than replace the entire Clinical Center complex in Building 10 with a new 3,000,000 gross square foot (gsf) facility as proposed in 1993, the 1995 Master Plan was based on a new or replacement 600,000 gsf Clinical Center inpatient hospital with 250,000 gsf of associated clinical research laboratories as recommended by the committee. The facility would be located at or adjacent to the existing Clinical Center because of operational exigencies. The remainder of the Clinical Center facilities in Building 10 would be renovated rather than replaced.

While the 1995 Master Plan reflected these changes, it still rested on site constraints and conditions and planning principles developed in 1993. The 1995 Master Plan underwent a rigorous review by neighborhood citizen associations, the general public, and jurisdictional government agencies.

Subsequently, it was determined during the design phase for the Clinical Center hospital replacement, the Mark Hatfield Clinical Center, that Center Drive would have to be realigned in the area to the north of Building 10. The road realignment, in turn, would require the shifting of potential facilities proposed for the northwest sector of the campus in the 1995 Master Plan. These changes were covered in a 1999 Amendment to the 1995 Master Plan.

Significant changes in the anticipated direction of biomedical research have occurred politically and scientifically since 1995. Funding for NIH biomedical research has increased rather than declined. The rate of growth in funding doubled from an average historic level of about five percent per year to ten percent per year between Fiscal Years 1997 and 2003, although the last two budgets have been more modest. Congress has established two new Institutes and four new Centers since 1995 (see Section 2.2.2 and 2.2.3). On the scientific side, accelerated developments in DNA, human genome, and genetic research have expanded the horizon or opened new avenues for research in nearly every other biomedical research discipline.

The following sections trace project development chronologically. The 1995 Master Plan, and all related preliminary alternatives developed for the 1995 plan, are no longer under consideration by NIH, although they form the basis or foundation for the Master Plan 2003 Update. They are briefly summarized in the following. More detail is given for the Master Plan 2003 Update Alternative and the No Action Alternative in Section 4.6. The Master Plan 2003 Update is the preferred alternative.

4.2 SITE PLANNING PRINCIPLES

A set of planning principles was established for guidance in subsequent detailed Master Plan project development. They are the first step toward conceptual planning, and represent broad design objectives which can be applied to any proposed features and alternatives that are developed in the planning process. Application of the principles in the planning process reveals conflicts that arise among them. One principle is not adamantly or strictly held at the total sacrifice of others. It is the purpose of a Master Plan to find the best or optimum balance among the set of principles as a whole.

The major planning principles for the Bethesda campus are:

Campus Structure

- Acknowledge the four anchor groups of buildings that will remain through the planning period and incorporate them into the Master Plan. They are:
 1. Buildings 1 through 5 in the historic area of the campus
 2. Building 6 and Building 31 in the northeast sector.
 3. Research buildings 29A, 29B, 37, 40, and 49 on the west side of the campus.
 4. Buildings 41, 45 and 38, 38A (the National Library of Medicine) in the southeast sector.
- Concentrate and intensify development in the campus core area (See Figure 2-3) to improve campus function and minimize impacts on surrounding neighborhoods.
- Respect and incorporate buildings eligible for the National Register of Historic Places into the overall campus structure.
- Respect the existing orthogonal or cardinal axis grid of buildings and roads.
- Relate existing and proposed future building groups into an identifiable hierarchy.
- Create open spaces in the interior of the campus to give definition to building groups and clusters and enhance the esthetic quality of this area.
- Retain the landscape character of the site perimeter and respect existing topography.

Landscape/Natural Features

- Respect the designated buffer zone, around the periphery of the site. Reinforce landscaped screen buffer adjacent to Edgewood/Glenwood. Retain less densely planted lawn areas allowing views into the site along Rockville Pike and Old Georgetown Road.
- Respect and enhance the esthetics of the stream valleys.
- Incorporate topography into site design to minimize development impacts.
- Emphasize two existing distinct landscaping zones - a landscape dominant zone with predominantly "natural" landscaping around the periphery of the campus, and the more urban building dominant zone in the core area where "formal" landscaping occurs.
- Preserve, reinforce, and enhance the distinctive aesthetic and natural character of the four corners of the site: the "Forest" in the northwest corner; the "Stream" in the northeast corner; the "Lawn" in the southeast corner; and the "Park" in the southwest corner.
- Create defined open space within the interior of the campus. Locate and utilize these open spaces to link various areas of the campus together and create a pedestrian friendly environment.

Development Proximity to Metro

- Encourage public transit use by locating new development within walking distance the Metrorail/Metrobus facility to the extent feasible.
- Public oriented amenities should be located close to the Metro station.

Development Density Zones and Community Buffers

- Create a series of development density zones for the site, with the highest density being located around the campus core and the lowest density toward the campus perimeter and surrounding neighborhoods.
- Maintain the open space buffers and views along Rockville Pike and Old Georgetown Road, consistent with security requirements.
- Enhance screening of neighborhoods along the north and south sides of the site.

Functional Relationships

- Recognize the Clinical Center Complex as the functional heart of the campus.
- Cluster administrative functions along the more "public" east side of the campus.
- Primarily locate laboratory and research uses toward the core of the campus with proximity to the Clinical Center.
- Maintain the northwest corner of the site for low-density residential and special use functions.
- Provide a secure and supportive environment for campus activities.

Clinical Center Renewal Development

- Retain and revitalize the Magnuson Clinical Center as a major campus organizational feature.
- The existing core of Building 10 will be retained and should remain the highest building mass within the new Hatfield Clinical Center composition.
- The clinical hospital and laboratory expansion will occur to the north and west of the existing Building 10. Future potential laboratory expansion will be located immediately to the south of the existing facility.
- New construction at the Clinical Center should respond to the strong axial nature of the existing building form.
- Due to the large bulk of the Clinical Center, appropriately scaled open spaces should be created around the building and the relative sense of openness of the surrounding landscape should be preserved.
- The "public" face of the Clinical Center and the primary public entry should be located on the north side of the complex, addressing the Loop Road or Center Drive. A primary "campus" or research entry for pedestrians should be located on the south side.
- A clear pedestrian access path should be accommodated through the building.
- Continue to locate service access on the east and west sides of the complex, away from the primary entries and pedestrian circulation paths.

Public Access and Orientation

- Reinforce the Rockville Pike and Old Georgetown Road corridors as the primary public "address" for the site.
- Reinforce campus organization through the creation of a "campus loop", which will become an orientating device for employees and visitors, and provide clear access to all areas of the site.
- Align the "campus loop" with existing campus circulation paths where possible. Design new

- portions so as to minimize impacts on neighboring communities.
- Designate the "campus loop" as the primary internal campus public "address" for NIH buildings. Reinforce existing buildings/groups which face the loop and orient new buildings/groups toward the loop.
 - Take greater advantage of access to the site by Metrorail through enhancement of paths between Metro and the core of the campus, and creation of internal campus pedestrian and bicycle connections to the north and south areas of the campus.

Parking

- Reduce surface parking located in the perimeter buffers where and when feasible.
- Reduce surface parking on the campus to the extent feasible to create a more pedestrian friendly environment and reduce stormwater runoff.
- Concentrate parking in existing or new parking "reservoirs" which are: a) conveniently accessed from major entries or the campus loop; b) located away from the Metrorail station; c) separated and buffered from residential neighborhoods.

4.3 THE 1993 DRAFT MASTER PLAN

4.3.1 Preliminary Concepts

The 1993 Draft Master Plan was presented as the proposed action alternative in the NIH Bethesda Campus Master Plan, Draft Environmental Impact Statement in October, 1993. It was predicated on complete replacement of the existing Clinical Center Complex as recommended by studies completed by the U.S. Army Corps of Engineers. The replacement Clinical Center was to be located in the square north of Building 11, since this was the only area of sufficient size within the campus that could accommodate the approximately 3.0 million gross square feet (gsf) of floor area that was estimated to be needed.

The 1993 Draft Master Plan used an NIH employee population of 22,900 by 2013 on the Bethesda campus as a basis for development of the plan. The planned future employee population associated with the 1993 Draft Master Plan would have led to an attendant growth in space requirements. Space requirements amounted to an estimated 11,300,000 gsf by the year 2013. If the 1993 Draft Master Plan were fully implemented, about half of the existing square footage would have been replaced or renovated over the course of the planning period. Much of this was attributable to the proposed total Clinical Center replacement.

In the initial phase of planning, it was evident that NIH possessed many of the positive physical and organizational characteristics of an academic, research, or university environment. A college or university "campus" is an American concept that provides a model for placing buildings devoted to the pursuit of knowledge in a hierarchal setting. Using layouts or plans from five American universities that were known to function well as a genesis for ideas and reference points, five concepts for development of NIH were generated.

Subsequently, a sixth concept, the Quad-Mall scheme, was added to the five original concepts by combining the best features of the Quad and Mall concepts. Two concepts, the Olmstedian and Quad-Mall schemes, were selected for further refinement as the "Park" and "Quad Campus" preliminary alternatives for the 1993 Master Plan. Each was adapted to existing conditions and adjusted to match anticipated NIH space requirements by type of use. All of the initial concepts were evaluated for functional relationships, community impacts, transportation needs and function, and campus quality. The

best components of each were incorporated into the two selected preliminary alternatives, which were then renamed as the "Quad Campus" and the "Park".

4.3.2 Principal Features

The 1993 Draft Master Plan Alternative was a refinement and a further development of the Quad Campus Preliminary Alternative. The principal features of the 1993 Draft Master Plan Alternative were:

4.3.2.1 Clinical Center Replacement

The focal point and fundamental premise of the 1993 Draft Master Plan was a new Clinical Center Complex that would replace the 2,385,000 gsf Building 10 complex. The new center would have been located on Center Drive to the west of the Metrorail and bus station with its front facing Rockville Pike. It would have had about 3,000,000 gsf of floor space exclusive of parking. About 1,400,000 gsf of this area would have been for clinical research laboratories, and about 1,300,000 gsf would have been devoted to patient care, but the number of patient beds was expected to be reduced to about 450. The remaining space, about 300,000 gsf, would have been for offices, support, and public spaces. The Clinical Center would continue to house about 6,500 employees as does the Building 10 complex. The larger square footage would provide more laboratory space, an upgrade in infrastructure and utility support systems, and correction of safety issues. The new Clinical Center would have been constructed between 1998 and 2004.

4.3.2.2 Central Heating and Cooling Plant Consolidation

The 1993 Draft Master Plan Alternative incorporated the 1992 Master Utility Plan improvement recommendations for the central heating and cooling plants in Buildings 11 and 34. Design of the new Clinical Center Complex would have been integrated with the expansion of the power plant in Building 11. In particular, it was proposed to combine all boiler stacks into a single stack which would be integrated within Clinical Center structures.

The Master Utility Plan proposed consolidation of power plant functions in Building 11, and the decommissioning and demolition of Building 34, which would occur when the Clinical Center replacement was in operation and Building 10 was decommissioned. The Master Utility Plan also proposed adding two new boilers and renovation and upgrade of four existing boilers. A cogeneration system could be added as an alternative to a sixth boiler. Existing Chillers 1 through 15 would be replaced by twelve new chillers of larger unit capacity.

4.3.2.3 Building 21

In the 1993 Draft Master Plan, a proposed replacement for the support service functions, now in Building 21, was projected as a three or five story building located on the south side of Building 11. The Building 21 replacement would have screened areas to the south from the lower levels of the power plant, and defined the north side of the south laboratory quad. The building would have functioned as an internal campus distribution and collection point for waste materials. Its adjacency to the Clinical Center Complex replacement would have minimized internal campus transport of these materials.

4.3.2.4 Research and Animal Care

The 1993 Draft Master Plan proposed a net increase of about 1,470,000 net sf of research space including that in the Clinical Center replacement complex. Laboratories and research facilities were set in clusters around malls and quads on the north, west, and south sides of the Clinical Center in proximity to it.

In the proposed western cluster, new research buildings would fill in gaps between an existing cluster of laboratories defining an east-west quad. Two new buildings, combined with those proposed in the north cluster and laboratories or research facilities on the south side of Building 10, defined a large 1,100 foot by 300 foot mall with the long axis running north-south.

A southern cluster of research buildings formed an additional quad. Building mass and heights in this quad would have been progressively smaller from east to west. The buildings on the east side of the quad would front to Rockville Pike and be 6 to 8 stories in height. On the west side, the buildings would have had 3-5 stories. A new animal care building which reoriented facilities from the horizontal single floor configuration in the existing Building 14/28 complex to a vertically oriented structure with a small floor plate would anchor the south side of the quad. Five to six stories extended above ground level.

4.3.2.5 Office and Support

Office and support facilities proposed in the 1993 Draft Master Plan were arranged over a large L-shaped area extending from Building 31 in the north, to the National Library of Medicine at the apex of the "L" to the south, and then westward along the southern periphery of the campus to the inside of the buffer area. Office and support includes administration, campus engineering and maintenance, and storage facilities supporting the Clinical Center and laboratories. The majority of office and support facilities were along the Rockville Pike leg of the "L".

New administration buildings were proposed to the east of Building 31, and on the east side of the NIH Stream north of South Drive on the site of existing Building 21, which would be demolished. Other support offices, receiving and warehouse functions, and replacements for Buildings 12 and 13 were integrated with parking structures on the south side of the campus in two new support service buildings.

These two new service buildings fronted proposed new parking structures, and would step down in height as one progressed toward the residential neighborhoods to the west. Ground elevations in this area, and in the research quadrant to the north are about 315 feet. Ground elevations at the southern NIH property line are 340 feet or higher along an arc extending from south of these support buildings to the NIH Stream valley at the end of Roosevelt Street, shielding the bulk of the building mass and Loop Road traffic from neighborhoods to the south and west.

The 1993 plan proposed a new fire station sited on the north side of Center Drive to the east of Old Georgetown Road to replace the station on the east side of the power plant.

4.3.2.6 Amenities

The chief physical amenities proposed in the 1993 Draft Master Plan Alternative included:

- Child care centers for NIH employee children. The four recommended locations were the Wilson family house (not Tree Tops) with its garage and storage sheds converted to play areas; a site just to the south of the Naval Medical station; expanded facilities in former Building 35; and an expansion of the existing child care facility in the southwest corner of the site.
- A three or four story campus building that would contain food service, recreation, retail, informal meeting places, and small conference rooms located at the present site of Building 34.

4.3.2.7 Roads/Parking/Pedestrian

In the 1993 Draft Master Plan, Center Drive would be widened from two to four lanes and serve as the primary access route through the campus directing traffic to the "front door" arc from Wilson Drive to the

Center Drive/Rockville Pike intersection. A relocated extension of Lincoln or Convent Drive would have completed a loop around the core area of the campus. Walks would be widened in the core area to accommodate emergency or service access, but general vehicular use within the core area would be prohibited. All existing campus entrances were to remain except East Drive on West Cedar Lane.

Surface parking would have been minimized throughout much of the campus. Areas around the perimeter of the campus now covered by surface parking were returned to natural conditions. Vehicles would park in multiple level parking structures (MLPs) distributed around the campus on the periphery of the loop road system. New MLPs were integrated into the topography to minimize impacts. Additional parking could be located underground. Underground parking was also located below the Clinical Center replacement, the new mall to the west of the Center, and a new laboratory complex that would have replaced the existing Building 10 complex.

Pedestrian and transit use was emphasized. Nearly half of the projected NIH employee population would have worked in buildings within 1,200 feet of the Naval Medical station. Connected malls and quads, and a covered walkway between the station and new Clinical Center, encouraged pedestrian use.

4.4 THE 1995 MASTER PLAN

The 1995 Master Plan was based on, and consistent with, the findings and recommendations of the External Advisory Committee, which reviewed and evaluated the intramural research program, and the Clinical Center facilities this program would need to function efficaciously. The plan placed greater emphasis on upgrading intramural research facilities than the 1993 plan, and lesser emphasis on consolidation of Extramural Research Program administration on the campus. Taking the Committee report projections into account, NIH management was reinterviewed to obtain an estimate of potential future campus population. Results indicated a decrease in anticipated population over the short term due to current and projected proposals to downsize government, but a long term growth of about 10 percent over the 1993 population levels. Much of the campus population growth was attributable to a consolidation of intramural research staff on the campus from off-site locations.

Under the 1995 Master Plan Alternative, it was estimated that NIH employees would be distributed in Montgomery County in the future as follows:

<u>Year</u>	<u>NIH Bethesda Campus</u>	<u>NIH Animal Center</u>	<u>Other Montgomery County</u>	<u>Total NIH Montgomery County</u>
1995	16,325	132	4,983	21,441
2000	15,150	114	3,838	19,078
2015	18,025	114	3,510	21,650

Programming for the 1995 Master Plan estimated a year 2015 space requirement of approximately ten million gross square feet (gsf), or 43 percent more than the 7 million gsf existing in 1995. Most of the increase was attributable to growth in laboratory space. About 2.3 million gsf of laboratories would be added to reach the goal of 300 net square feet per researcher in laboratories, despite only a small increase in the projected numbers of NIH intramural researchers. The Clinical Center renewal hospital accounted for much of the remaining growth. Most of the growth in laboratory space would occur after 2010. At ultimate buildout, about 4.7 million gsf of building space would be new or renovated space, and about 5.3 million gsf would be existing space to remain in use.

Three concept studies (A, B and C) were developed to determine the potential ramifications of a Clinical Center Complex renewal instead of a replacement (Final Environmental Impact Statement for the 1995 NIH Bethesda Campus Master Plan, Vol. 1 of 2, NIH, 1996). The studies were meant to test the reactions of NIH and citizen groups to different possible development scenarios for the Clinical Center Complex. The studies indicated potential trade-offs among the planning principles developed in Section 4.2, and were a planning mechanism in that the best features of each concept could be incorporated and consolidated into the Master Plan.

All three studies were premised on NIH Bethesda growth from 16,325 to about 18,000 employees, a new Clinical Center hospital north of Building 10, and that over the next 20 years, NIH would need an additional 2.3 million gsf of laboratory space, primarily to decompress existing facilities and bring laboratory space per researcher up to average national standards. About 10 to 12 new buildings would be necessary to accommodate this laboratory space expansion. The studies premised that NIH would also need about 70,000 gsf of new office space to decompress administration areas, two new child care centers, and a new fire station. Each concept retained the internal campus Loop Road developed in the 1993 Master Plan Alternative for improvement of campus organization and circulation.

Consistent with the planning principles outlined in Section 4.2, the studies proposed new development concentrated in the campus core area to the extent feasible, drawing development away from the buffer zone and site periphery. Most of the core area is already occupied, and few sites are available for unfettered development. The squares to the north and south of Building 11 currently have comparatively low density development. The Building 12 and 13 group is generally two to three stories above the surrounding ground level. With the exception of a small administrative area on the northwest corner, Buildings 14 and 28, the animal care facilities are single story structures occupying a large ground or surface area. If high density replacement facilities are to be accommodated and intensified in the core area away from the site perimeter, these low density facilities must be relocated.

The 1995 Master Plan adopted and refined the best features of the concept studies. It is described in detail in the 1995 Master Plan, NIH Main Campus, NIH, 1995. The Master Plan set forth NIH program requirements and planning goals and objectives. It defined site planning principles and concepts, existing features, environmental and infrastructure constraints, and the community context. Guidance is given on proposed campus land use, building sites, amenities, road and site improvements, vehicle and pedestrian circulation, and service access. Possible phasing of construction or eventual implementation of the plan was given. The Illustrative Plan for the 1995 Master Plan Alternative is shown in Figure 4-1. The major features of the 1995 Master Plan Alternative are summarized in the following sections.

4.4.1 Clinical Center Renewal

The total floor area in the Building 10 complex is about 2,273,000 gsf exclusive of parking. The original Clinical Center, which was dedicated in 1953, includes the clinical inpatient hospital, and associated clinical laboratories and research space. It accounts for 1,245,000 gsf of the total floor area. Many additions to this original core building were built over the intervening years. The largest of these is the Ambulatory Care Research Facility (ACRF), which added nearly one million gsf of space devoted to outpatient clinical care and research in 1980.

A three step program for renewal of the Clinical Center Complex was proposed and is in the process of being implemented, i.e.,

- A. Essential Maintenance and Safety (EMS) Program.
- B. New inpatient hospital and clinical laboratories.
- C. Renovation and rehabilitation of Clinical Center core built in 1952.



FIGURE 4-1 THE 1995 ILLUSTRATIVE MASTER PLAN.

The intent of the Essential Maintenance and Safety Program was to maintain a healthy and safe environment in the complex until the original core renovation could be completed. This step has been completed.

In the second step, a new state-of-the-art, 240-bed inpatient hospital, associated clinical research, and support functions would be built. A complex lattice of operational and organizational interrelationships exists between the hospital, laboratory, and support functions within the Clinical Center Complex. Construction of the Clinical Center Renewal Hospital was proposed on the north and, if needed, west sides of the existing complex.

The new hospital would have about 600,000 gsf of floor area, and related research space would occupy 250,000 gsf. Only about half of the clinical research facilities would move into the new facility with the remainder remaining in Building 10. Estimated overall space allocated for the facility was the minimum necessary to provide safe and efficient operations as foreseeable by scientific and health care specialists at the time. New space would be flexible and adaptable to meet a wide variety of unexpected requirements, particularly in terms of capacity of supporting infrastructure and utilities.

Upon completion of the new Clinical Research Center Hospital, personnel and functions would be relocated or transferred to the new facility. The vacancies created in the old existing space would permit implementation of the third step in the renewal process, complete renovation and modernization of Building 10. This would be done in phases with the Essential Maintenance and Safety Program continuing throughout the process until all spaces were renewed.

4.4.2 Central Heating and Cooling Plant Consolidation

The 1995 Draft Master Plan Alternative continued to use the Master Utility Plan proposals prepared in 1992 for modernization and expansion of the central heating and cooling plant. Many of the proposed improvements are needed to meet current campus demands, refurbish equipment, and increase energy efficiency in production of steam and chilled water.

As in the 1993 Draft Master Plan, Building 11 would be extended about 60 feet to the south, and 100 feet to the east to accommodate new boilers and chillers. An underground expansion would also be built on the west side for an underground equipment room and above ground offices, and employee spaces. Two new boilers were to be added, the four existing boilers would be refurbished, and flue gas recirculation would be installed for stack air emission control. Existing Chillers 1 through 15 in Buildings 11 and 34 would be replaced by installation of 12 new larger unit chillers over the next 20 years in Building 11.

The 1992 Master Utility Plan also recommended the following:

- The merger of the individual stacks for Boilers 1 through 5 into one combined stack. The new stack height would be higher to improve emission aerodynamics.
- Backup fuel tanks would be relocated to the north side of Building 11.
- Ice storage, located in a sublevel of the Building 11 expansion, would be used as a chilled water storage option.

All chilled water production facilities would be consolidated in Building 11, and Building 34 would be decommissioned and razed.

The first two recommendations have been implemented. An ice storage system was designed as part of the Building 11, Phase I, expansion, but it was not built when bedrock was encountered at a more shallow depth than expected during construction. It remains a potential option on an individual building basis.

Consolidation of chillers in Building 11 is underway, but this process will not be complete until after 2010.

4.4.3 Research and Animal Care

The 1995 Master Plan identified 12 to 14 campus sites as potential locations for eventual construction of up to 2.3 million gsf of laboratory space. Most of the new space would be for decompression of existing laboratory space, increasing the space per researcher to approximately the current national average. In general, phasing of construction at each site, and assignment of space to a specific Institute was not defined, providing maximum development flexibility.

Potential laboratory or research building sites were concentrated in the campus core area. Three research oriented buildings, including Building 50, were grouped in a cluster to the north of the central heating and cooling plant in Building 11 (East Quad), while three others combined with a new service/shop building to form a new quadrangle on the south side of Building 11 (South Quad). The potential research facility site on the west side of the south quadrangle, new site N, was shifted about 150 feet to the east, further away from Glenwood than proposed in the 1993 Draft Master Plan. Laboratory Buildings 29 and 30 would be replaced by Building G, and two additional new research building sites were identified within the existing groups of laboratories on the west side of the campus (West Quad). New research building construction would define an open space mall (Central Mall) extending from the Clinical Center Complex in the north to Building 34 to the south.

Two sites were available for development in the latter phases of the planning period. The first, Site A, was north of the Clinical Center Complex. The site could be used for residences or special functions related to the Clinical Center, where immediate proximity or adjacency was not needed. The other, Site E, was located in the NIH Stream valley, replacing Building 21. Site availability, however, would be contingent on relocation of Building 21 along with its activities. It was anticipated that Site E would be among the last sites to be developed within the plan.

Relocation and replacement of the existing animal care facilities in Buildings 14 and 28 is a key element in initiating the process of concentrating NIH facilities in the core area of the campus. Buildings 14 and 28 have a sprawling footprint covering a large ground area. Consolidation of facilities frees this area for subsequent development of a cluster of buildings around a quadrangle south of Building 11. The new animal facility was sited on the west side of Building 41. It would be oriented vertically, rather than horizontally, to reduce the foot print required.

4.4.4 Office and Support

Predicted growth in office and support space was reduced from the approximately one million gsf proposed in the 1993 Draft Master Plan to about 170,000 gsf. About 95,000 gsf of this office and support growth would be in the Building 2 and 3 conversions from laboratory to office buildings. The remainder of the growth would be in a new building, which could be located on the east side of Building 45, or to the east of Building 31, depending on the actual sequencing of future events.

When the Building 13 site was needed for a future development, Building 13 activities would be relocated elsewhere. Administrative offices for support activities, about 200,000 gsf, would be merged with facilities proposed for general office space. Shops, supply activities, and other non-administrative support services in Building 13 were relocated to the proposed service building on the south side of Building 11, where they were combined with Building 21 services, if that facility was relocated.

4.4.5 Amenities

Physical amenities proposed in the 1995 Draft Master Plan Alternative include:

- Designation of the Building 34 site as a potential location for a Campus Center, which would be oriented toward activities and uses for NIH employees and nearby residents. Visualized activities include conference and meeting rooms; a child care center; a fitness center; dry cleaners, concession stands, and credit union outlet. This facility is not programmed.
- New child care centers would be built on the north side of the campus near the Clinical Center. The infant care facility in Building T-46 in the southwest corner of the campus would be replaced by a larger facility at the Building 34 site. Campus child care capacity would be increased from 99 to 465.
- Large open malls and quadrangles with landscaping and street furnishings to encourage NIH employee interaction.
- Site A to the north of the Clinical Center was set aside as a potential location for residences or special functions related to the Clinical Center.
- Natural landscaped areas around the buffer periphery and along stream valleys that cross the campus.

Although no specific buildings or facilities were proposed, a zone to the north of the Clinical Center was set aside as a potential site or sites for unprogrammed buildings that could have a special function or residential use. Use would not be directly related to laboratory or clinical research, or their technical support, or office use. Examples of potential use of the zone included expansion of the residential area along West Cedar Lane, residences for visiting scientists or research fellows, expansion of Children's Inn facilities, or construction of a comparable Adult Inn or a child day care center. Facilities would be low in profile, have little or no impact, and generate little employee traffic.

4.4.6 Roads/Parking/Pedestrian

As in the 1993 Master Plan, a Loop Road was the main feature for internal campus access. It would circulate traffic around the perimeter of the core area. Its section would have different configurations at various locations depending on projected traffic volumes and whether parking and bikepaths were present. The sections range from a simple two lane roadway without bikepaths to a four lane road with median that would have a total curb to curb width of about 62 feet when bikepaths are present.

In the southwest sector, the 1995 Master Plan Loop Road was shifted to the east of the 1993 plan alignment, increasing the distance to the east side of Edgewood/Glenwood, from 300 to 400 feet. In addition, the Loop Road was routed around the north and east, rather than the south and west sides of the Building 34 site.

The 1995 Draft Master Plan continued to emphasize removal of surface parking, particularly parking in the buffer zone along the campus periphery, and its relocation to multiple level parking or MLP structures. New MLPs were proposed to the northwest of the Clinical Center Complex and in the northeast corner of the site, primarily as replacements for surface parking in these areas. One or more levels of parking could be located under the quadrangle or plaza south of Building 11.

Emphasis and encouragement of pedestrian and transit use also continued. Ten of the potential building sites in the 1995 Draft Master Plan were located within a five to eight minute walk of the Metro station entrance. Fourteen of the potential sites were within a 2,000 foot radius of the Metro station escalator.

4.5 NORTHWEST SECTOR AMENDMENT

The 1995 Master Plan recognized the potential need to relocate Center Drive on the north side of Building 10 and the Clinical Center Complex to accommodate the new Mark Hatfield Clinical Research Center hospital. Center Drive was realigned northward in the Illustrative Plan in response to this requirement. The 1995 Master Plan noted that the massing of the new building and an appropriate setback from the realigned road were important.

NIH conducted a worldwide competition for the design and construction of the new facility. The winner of the competition proposed a facility that best met operational requirements and programming criteria as well as excellence in architectural design. The proposal also had a relatively low vertical profile. In general, it was six instead of the anticipated ten stories high. This meant that a larger footprint would be needed to house the programmed floor space. Center Drive would have to be relocated further northward than anticipated and this, in turn, would affect the arrangement of potential development sites and facilities proposed for the area to the north of Building 10 in the 1995 Master Plan.

The area affected covered Building 10 and its vicinity, and the northwest sector of the campus from just east of West Drive to just south of South Drive. The necessary changes were developed and analyzed in an amendment, (Amendment to the 1995 Master Plan, NIH, 1999). Since the changes primarily involved rearrangement of proposed facilities within the area affected, there were no substantive changes in potential environment impacts in the context of the Master Plan as a whole. Potential impact changes were evaluated and discussed in Proposed Revisions to Northwest Sector of the 1995 Master Plan, Final Supplemental Environmental Impact Statement, NIH, 1999.

The 1995 Master Plan set aside a general area, Site A, on either side of West Drive as a zone for potential uses unrelated to research, clinical, technical support, or office use (see Figure 4-1). Realignment of Center Drive affected the efficacy of Site A for potential development. The resultant principal changes in the Northwest Sector Amendment were:

- Realignment of Center Drive further to the north encroaching upon Site A.
- The relocation of the MLP-A parking structure from the Site A area west of West Drive to the west side of Building 10.
- The shift of the proposed Fire Station on the north side of Center Drive about 400 feet westward.
- The relocation of the Northwest Child Care Center from the east Site A area to the 1995 Master Plan fire station site.
- Designation of the area north of Building 60, the Convent, as a potential site for an Adult Inn or Guest House. The Adult Inn was visualized as a 24-room, two story counterpart to the Children's Inn, where long term Clinical Center inpatients could be temporarily housed and gain relief from weeks or months of confinement in a hospital environment.
- A new NIH north substation on the east side of the relocated fire station.

4.6 SECURITY PROJECTS

Following the April 1995 bombing of the Alfred P. Murrah Federal Office Building in Oklahoma City, the Department of Justice was tasked with developing a "Vulnerability Assessment of Federal Facilities" which was released in June 1995. Immediately thereafter, President Clinton in a Presidential Directive, ordered all agencies to begin a security upgrade process, and in October of the same year, by Executive Order 12977, established the Interagency Security Committee to develop and ensure compliance with government-wide physical security criteria.

NIH developed its Security Assessment in response to the Presidential Directive in August 1995, but the absence of significant new physical security funding delayed action by nearly all federal agencies. In summer 2001, the DHHS Office of the Inspector General (OIG) reviewed the NIH Bethesda campus physical security and made the following recommendations:

- Improve perimeter security by installation of a perimeter fence with a limited number of controlled entry and exit points, construction of a visitors center and parking facility, and installation of additional surveillance and security features.
- Construct a centralized shipping, receiving, and storage facility.
- Improve interior building security.

The attacks of September 11, 2001 and subsequent attention to physical security needs of the federal government by the Congress and public brought new urgency and significant funding for the measures required by the DHHS.

NIH is addressing all of these recommendations which are in various states of completion. For example, the NIH either has submitted or is in the process of submitting the physical security projects to NCPC for its review. The projects include:

- A perimeter fence surrounding the entire campus with vehicular and pedestrian gates has been completed. The gates provide access for employees on foot or bicycle at 13 points around the perimeter, and for employees in vehicles at six locations plus employee vehicle egress only at one location. Employees and their vehicles are screened in various modes depending on the Alert Level issued by the Department of Homeland Security (DHS). When all perimeter security features are in place, the main access for visitors arriving by foot, transit, bicycle or vehicle will be at the Gateway Center at the Metro bus and rail station on Rockville Pike and South Drive where a visitor parking structure will be constructed. After screening, most visitors will walk or use internal shuttle service to their interior campus destinations. A secondary access for Clinical Center patients and their visitors arriving by foot, bicycle or vehicle will be West Drive on West Cedar Lane where vehicle and personal screening will occur. Visitor vehicles proceeding to the Clinical Center parking garage are and will be screened also at the entrances to the garage.
- A centralized shipping, receiving and storage facility with screening capabilities, as recommended by the DHHS OIG, has been studied for both on an off campus locations. A campus location that provides adequate space for vehicle screening, receiving and storage inside the perimeter fence, and at the same time, sufficient standoff from other occupied buildings, is not available. Acceptable off campus locations that met the same requirements, as well as intercept vehicles with far and near points of origin around the compass, also could not be found. Therefore, instead of a centralized shipping, receiving and storage facility, the NIH is planning a Commercial Vehicle Inspection Facility with a dedicated access from Rockville Pike (MD 355).
- The location of the perimeter fence, commercial vehicle inspection facility, and Gateway Visitor Center are established by security parameter and requirements. They will be implemented under both the Master Plan and No Action Alternatives.
- Interior campus and building security has been handled through appropriate measures below the scale of master planning.

4.7 ALTERNATIVES UNDER CONSIDERATION

4.7.1 Proposed Action - The Master Plan 2003 Update

The Master Plan 2003 Update continues to use the same fundamental planning goals and objectives, and site planning principles, concepts, features and constraints that were established in the 1995 Master Plan with only minor modifications. Similarly, guidance given for proposed site land use, road and site improvements, vehicle and pedestrian circulation, and interior campus service access have changed only in application to detail and not in general principles. The update is described in detail in NIH Master Plan 2003 Update, NIH, 2004. The Illustrative Plan portion of the Master Plan 2003 Update Alternative is shown in Figure 4-2. A larger scale schematic version is shown in Appendix B.

Since 1995, planning premises for the Bethesda campus have been changed in three fundamental ways: budget, pace of development, and security.

- NIH Budget

The NIH budget historically grew by about five to ten percent from year to year. However, Congress doubled the NIH budget between FY 1998 and FY 2003 from \$13.6 billion in to \$26.8 billion. Funds have been directed not only to more across the board biomedical research, but also to specifically mandated facilities such as the Neuroscience and Vaccine Research Centers, two new Institutes and four new Centers, and dynamically expanding research fields such as genetics.

- Pace of Development

As a consequence, the pace of development on the campus has accelerated in terms of both facilities and personnel. Over the last three years, five buildings have been built, and seven others are currently in the design or construction stages. The campus population, expected to grow slowly to 18,000 by 2015 in the 1995 Master Plan, has already increased from 16,325 in 1995 to 17,511 in 2003.

- Security Requirements

The change from an open campus prior to September 11, 2001, to one with a perimeter security fence and controlled of pedestrian and vehicle access.

4.7.1.1 Campus Population

The NIH Bethesda campus employee population undergoes continual change. For planning and analytical purposes, the existing or 2003 campus employee population has been set at 17,511 as established in the annual NIH campus employee census. An additional 8,360 NIH employees work elsewhere at about 30 leased locations in lower Montgomery County. Most of these sites are concentrated at the Rock Spring Office park near Montgomery Mall, and in the I-270/MD Route 355 corridor between Bethesda and Gaithersburg. The above off campus figure does not include the NIH employees, about 115, who work at the NIH Animal Center near Poolesville in western Montgomery County, nor other regional personnel at NIH facilities in Baltimore and Frederick, Maryland.

Estimates of future functional, personnel, and space needs form a framework for the Master Plan. These estimates were obtained through a programming process. Knowledgeable personnel in the 27 institutes and centers, and key officials in the Office of the NIH Director were interviewed. Each was asked about the direction of research within their respective organization, and for NIH Bethesda as a whole.

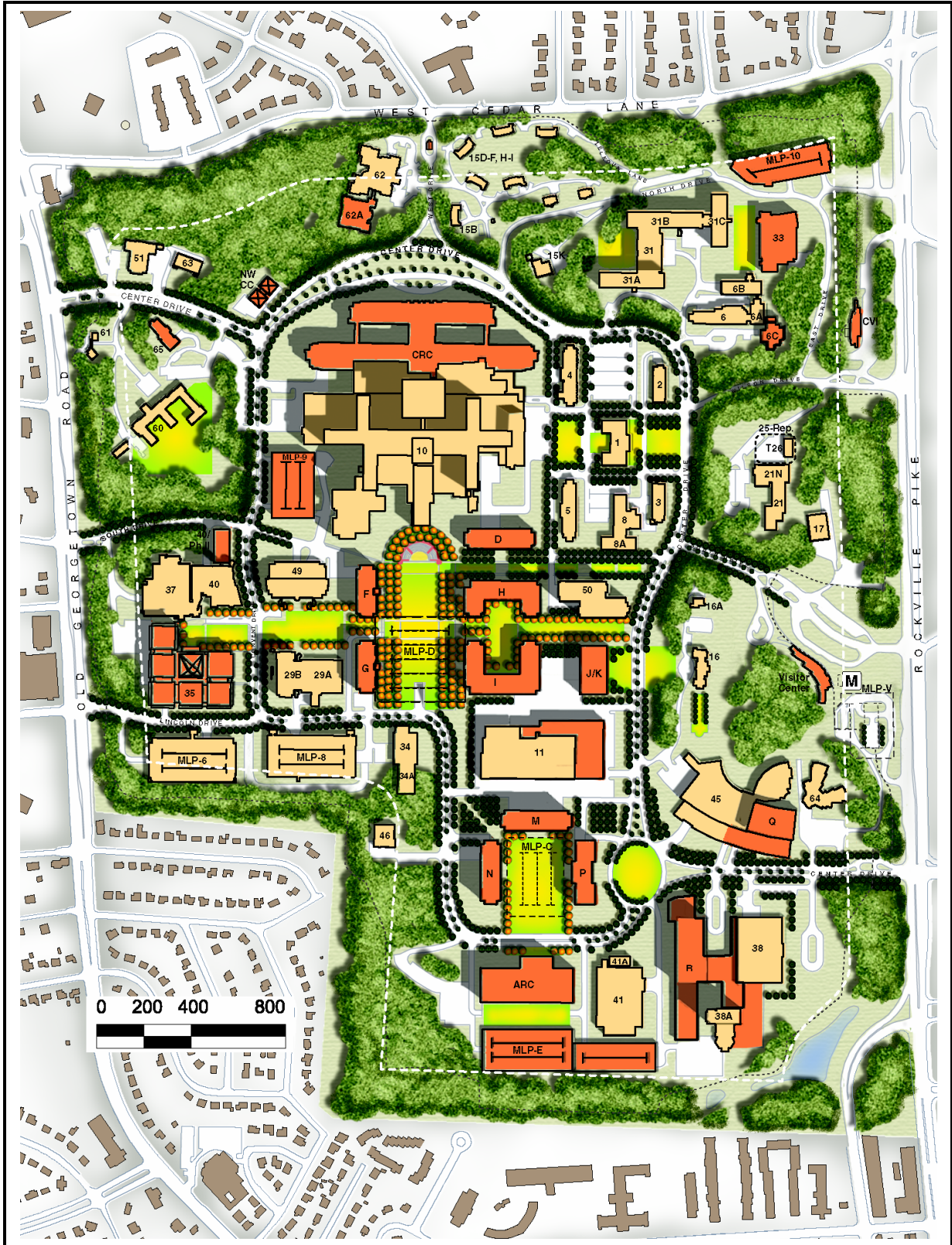


FIGURE 4-2 THE MASTER PLAN 2003 UPDATE ILLUSTRATIVE PLAN.

The interviews were supplemented by questionnaires that asked for more detail. Those interviewed emphasized the importance of the campus intramural research program, and increasing collaboration among the Institutes, Centers, and clinical research facilities, confirming the findings done for the 1995 Master Plan. The results of the interviews and the questionnaires were analyzed in to derive a cumulative potential Bethesda campus population.

Most of the potential growth in campus population was attributable to the desire on the part of the Institutes and Centers for increases in or consolidation of intramural research facilities on the campus. Although personnel projections, based on the interviews, exceed 22,000 in the aggregate, the Master Plan 2003 Update is based on a campus population ceiling of 22,000 for several reasons revealed in the planning process. While NIH can still maintain its peak hour trip generation at or below 1992 levels at higher campus population levels, and subsequently meet the conditions of the Memorandum of Understanding with planning agencies, the traffic volumes generated by a campus population greater than 22,000 may produce unacceptable levels of congestion at the intersections around the campus periphery.

The ICs indicated in the interview process that concentration of intramural research at the Bethesda campus, was preferable to administrative functions. Research requires more space per employee, and generates more utility demand per unit of building space than most other occupancies. If research facilities are maximized on the campus, there is insufficient room for expanding the central heating and cooling plants in Building 11 beyond a level of 22,000 employees when research functions are emphasized. While individual research buildings with independent heating and cooling systems could be built, such systems would not have the same operating reliability and efficiency, nor cost effectiveness. As development density increases, construction of new facilities, and maintenance of existing infrastructure becomes more intricate and complex with associated added costs. This situation begins to occur when the population is greater than 22,000.

NIH has, therefore, determined that the practicable capacity of the Bethesda is 22,000 at this time. The balance of any growth beyond this level will have to occur elsewhere in locally leased or other types of facilities. While a 22,000 population is below that ideally desired by IC leadership, it allows for a balanced response between future NIH programmatic biomedical research needs, and the tenets, goals, and constraints on which the Master Plan itself is based. Analysis of the IC projections was revised to reflect this premise. For planning purposes, the resultant potential campus growth in personnel is projected to be as follows:

<u>Master Plan</u>	<u>Campus Population</u>
2003	17,511
End of First Phase	18,510
End of Second Phase	19,951
End of Third Phase	20,409
End of Final Phase	21,878 (22,000)

4.7.1.2 Building Space

The Bethesda campus had approximately 7.0 million gsf of floor space in 2000. In 2001, three buildings (Laboratory Buildings 40, 50, and the East Child Care Center) were partially or completely occupied during the year, while Building 35, which housed a dining center and child care center, was vacated and demolished. The North electric power substation was built in 2002, and equipment installed in 2003.

The campus building status in 2003 has been used as the baseline condition in the Master Plan Update. Year 2003 campus buildings are listed in Table 4-1 by building use. The campus has over 7.4 million

Building	Clinical	Research & Research Support	Office/ Admin.	Animal	General Support	Utility	Residence	Other
1			95948					
2		46860						
3		48860						
4		91292						
5		91292						
6, 6A, 6B		145043						
7		48860						
8, 8A		99296						
9		32500						
10 hospital	1246837							
10 clinical	1025843							
11						150000		
11 phase II						82400		
12, 12A, 12B					156236			
13					212690			
14 all				245252				
15B			8065					
15C-15I							52345	
15K		11670						
16, 16A			20360					
17						7651		
18, 18T				6550				
21, 21N		36216						
22, 22A					15810			
25					4445			
28 all				26501				
29		89949						
29A		106694						
29B		102700						
30		93940						
31A-C			582037					
32				9768				
34						72547		
36		236285						
37		248469						
38, 38A					452467			
40		84600						
41, 41A		141,794						
45			372535					
46						11526		
49		270311						
50		290000						
51					22000			
53						3968		
60			67500					
61, 61A					3296			
62							37565	
63						10030		
64								21000
T2					495			
T14					4000			
T23					5376			
T26					2900			
T39					5160			
T46								3000
SUBTOTAL	2272680	2316631	1146445	288071	884875	338122	89910	24000
							TOTAL	7360734

TABLE 4-1 EXISTING (YEAR 2003) OCCUPIABLE BUILDING SPACE BY TYPE (in gross sf).

occupiable gross square feet (gsf) of floor space, excluding parking structures. Buildings have been assigned to a space type category based on the dominant or chief use within the building, although other types of space are generally present. Many research facilities, for example, have laboratories, offices for management and researchers, animal spaces, and general support such as material supply and waste handling, but are considered to be laboratories for impact purposes. Each type of space use generates different impacts, particularly in terms of utility usage, and the breakout by use differs from that given in the Master Plan, which uses different classifications for some individual buildings for planning purposes.

Master Plan building space projections are shown in Table 4-2. Proposed projects are listed on the left side of the table with cumulative totals for each Master Plan phase. The end of the Third Phase corresponds to the 2020 Master Plan planning horizon. Development of sites with Buildings D, H, and Q would occur beyond that year in a Final Phase to campus buildout. While individual buildings or sites are listed in the general order of potential development, actual implementation at any site can shift between phases depending on circumstances. Three columns on the right side track buildings by proposed disposition: new construction, renovation or reuse, or demolition. Most of the projects identified by an alphabet letter have been designated as laboratory or research facility sites, but they could be used for other suitable purposes.

For purposes of master planning, programming for future new space needs is based on a space criteria of 540 gsf per researcher for laboratory space and 273 gsf per employee for office space. It was assumed that existing buildings to remain would not be decompressed, i.e. the gsf per worker would not increase, but remain unchanged. The square foot areas of short term projects renovations are based on current project planning. Space other than that noted above is projected using standard architectural or planning factors.

Total campus building space would increase to about 10.7 million gsf, if all the prospective building projects were built. This would represent an overall increase of about 46 percent over the 7.4 million gsf existing in 2003. Proposed new parking structures, either in new MLPs or under proposed campus malls, would add another 1,542,000 gsf that is not included in the table.

If the Master Plan is fully implemented about 4.6 million gsf of new occupiable space would be added to the campus through 26 new construction projects exclusive of parking. Proximity to the Clinical Research Center, a major investment, is a vital element in much of the campus research. Maximizing future laboratory and research space is the best development option for the campus. Under full implementation of the Master Plan, research space would double from about 2.3 million to nearly 4.5 million gsf at full buildout. The proportion of campus space devoted to laboratories and direct research would increase from 31 percent of total space to 42 percent. The average space per worker would increase from 420 gsf in 2003 to 487 gsf under full implementation conditions.

The Master Plan retains over 80 percent of the existing space. A total of 5.55 million gsf, or 75 percent of existing space, would be retained without renovation. About 567,000 gsf would be renovated or adapted for new use. Most of this renovated space is associated with Building 10, where existing hospital and clinical research areas would be converted to more general research uses. Virtually all of the proposed demolition is needed to make room for new construction, and more efficient use of ground space within the developable portion of the campus.

4.7.1.3 Major Features

The major features of the Master Plan 2003 Update are:

- The Neuroscience Research Center

Building	Clinical	Research & Support	Office/ Admin.	Animal	General Support	Utility	Residence	Other	Total Active Space	New	Renovation	Demolition
EXISTING TOTAL 2003	2272680	2316631	1146445	288071	884875	338122	89910	24000	7360734			
65 (Family Lodge)							26500			26500		
62 (Children Inn add)							34000			34000		
NRC PHI		265000										
Clinical Research Cen	1050000				6719							
Commercial Veh. Inspection												
10 stabilize/upgrade	-297756										See 10 reoccupy	-236285
36		-236285										
Gateway Visitor Center		150000			20528					20528		
33		16500								150000		
6C addition										16500		
NRC PH II		335000										
10 Central Core		49227								49227		
3 research to office		-48860	48860								48860	
10 E & F wings	-147000										See 10 reoccupy	
NW Child Care								21000		21000		
T23					-495							-495
T39					-5160							-5160
25 Replacement					12000					12000		
22,22A					-15810							-15810
25					-4445							-4445
T23					-5376							-5376
CUM TOTAL 1st PHASE	2877924	2847213	1195305	288071	892836	338122	150410	45000	8634881	1986474	48860	-267571
Animal Research Center										335000		-245252
14												-26501
28												-6550
18												-9768
32												
M		178500								178500		
11 Phase III										35000		
40 Phase II						35000						
N										50000		
10 Reoccupy										137700		
10A	-56000										444756	
R					389370					389370		-56000
12, 12A, 12B					-156236							-156236
P												
34/Campus Center								72547			72547	
CUM TOTAL 2nd PHASE	2821924	3841769	1195305	335000	1125970	300575	150410	117547	9888500	1309170	517213	-500307
continued next page												

TABLE 4-2 PROJECTED MASTER PLAN ALTERNATIVE OCCUPIABLE BUILDING SPACE (in gsf).

Building	Clinical	Research & Support	Office/ Admin.	Animal	General Support	Utility	Residence	Other	Total Active Space	New	Renovation	Demolition
29		-89949										-89949
7		-48860										-48860
9		-32500										-32500
J/K			212175							212175		
13					-212690							-212690
T-14								-4000				-4000
T-46								-3000				-3000
30		-93940										-93940
I		249900								249900		
G		112200								112200		
F		149600								149600		
CUM TOTAL 3rd PHASE	2821924	4088220	1407480	335000	913280	300575	150410	110547	10127436	723875	0	-480939
D		168700								168700		
Q			190000							190000		
H		229500								229500		
CUM TOTAL FINAL PHASE	2821924	4486420	1597480	335000	913280	300575	150410	110547	10715636	588200	0	0
MASTER PLAN TOTAL										4607719	566073	-1248817

TABLE 4-2 (cont) PROJECTED MASTER PLAN ALTERNATIVE OCCUPIABLE BUILDING SPACE (in gsf).

The Neuroscience Research Center (NRC) will be a 600,000 gsf laboratory where research on the brain, head, and neurological systems conducted by ten individual NIH Institutes will be merged into one consolidated facility. It will be built in the West Quadrangle replacing Buildings 35 and 36. Building 35 housed a dining center and the West Child Care Center; Building 36 contained research laboratories.

To maintain ongoing research, the NRC will be built in two phases. The first phase started in September 2001 with the demolition of Building 35. Phase I of the NRC, built in its place, is scheduled for occupancy in 2004. Laboratory Building 36 will then be demolished to make room for NRC Phase II construction after transfer of Building 36 researchers to the Phase I facility. Phase II would be occupied by researchers transferred from other laboratories on the campus. Phase II is scheduled for completion in 2008.

- Clinical Research Center/Building 10 Renovations

The Master Plan 2003 Update accounts for progress and developments in the Clinical Research Center (CRC) and Building 10 stabilization and core renovation program. The new Mark Hatfield Clinical Research Center is under construction and scheduled for occupancy in 2004. It will replace the existing Warren Magnuson Clinical Research Center. It will include a 240-bed inpatient hospital occupying about 600,000 gsf of floor area, and 450,000 gsf of associated clinical research laboratories as proposed in the 1995 Master Plan. Employees would be transferred from the old clinical center to the new Hatfield CRC.

Completion of the Hatfield CRC will then permit initiation of the next program step, stabilization of Building 10 and electrical and mechanical renovation of central wings E and F within Building 10. The stabilization program would be a precursor to a second step, a more complete program that would convert the Magnuson hospital and clinical research to more general biomedical research facilities. About 445,000 gsf of space would be stabilized and renovated. Separately, 49,227 gsf of space will be added to the central core of Building 10 by filling in or adding floors to an existing interior atrium. Since this space is interior to the building, it does not appear in Figure 4-2. Building 10A would be demolished.

- Northwest Sector Amendment Area

The Master Plan 2003 Update acknowledges and incorporates the changes in the 1995 Master Plan Northwest Sector Amendment. Projects proposed in the amendment are in various stages of implementation. Center Drive has been realigned to its ultimate Master Plan location and configuration. The Family Lodge and an addition to the Children's Inn are in the construction phase of development. The North electric power substation and the fire station were built in 2003.

- Central Heating and Refrigeration Plant (Building 11) Expansion

Planning for utility and support infrastructure improvements has been updated to account for Master Plan revisions and the changing status of projects proposed in the 1992 Master Utility Plan (Master Utility Plan: 2000 Update, Mueller Associates II, Inc./TA Engineering, 2000). Many of the projects proposed in 1995 have been completed, or are in the process of being implemented. In the latter case, they are either under construction or in the design phase.

Work completed at Building 11 includes the installation of Boiler 5, overhaul of and retrofit of low nitrogen oxides emitting burners on Boilers 1 through 4, combining individual boiler stacks into a single stack, and dismantling and removal of the medical/pathological waste incinerators.

A 23 megawatt (MW) electric power cogeneration facility to be built and operated by PEPCO is currently in the performance testing phase. Once operations start, PEPCO will be responsible for unit operations

for the first ten years, and NIH will then take over ownership and operation. Exhaust heat from the power generating turbine will be used to generate steam in Boiler 6 for NIH use once operation starts. The facility is currently in the systems testing phase, and is scheduled to begin operation in 2004. It will increase plant firm steam generation capacity from 600,000 to 780,000 lb/hr.

The program to expand the chilled water plant is underway. It includes consolidation of chilled water production facilities in Building 11 and the eventual closure of facilities in Building 34. Installation of Chillers 22 through 25, each with a 5,000 ton capacity, and their associated cooling towers was completed in 2003. Chillers 26 through 27 are scheduled to follow in 2004.

The Master Plan 2003 Update would increase the amount of campus space at ultimate buildout to about 10.76 million gsf. Much of the increase would be laboratory/research space, which has a much greater utility demand per unit square foot than other types of building space. Projected utility demands therefore will increase at a greater proportionate rate than building space.

New projects proposed in the Master Utility Plan 2000 Update and Master Plan 2003 Update accommodate the projected increases in steam and chilled water demands. One additional boiler, Boiler 7, would increase the projected firm capacity of the steam generation plant to an ultimate 980,000 pounds per hour.

On the chilled water side, four additional chillers, 28 through 31, would be installed in Building 11, while the facilities in Building 34 would be retired. The net result would increase plant total capacity to 80,000 tons.

- Waste Handling and Treatment

The 1995 Master Plan proposed demolition of Building 21 and its replacement with Building E, a research facility. Building 21 functions would have been moved to Building M on the south side of Building 11. Under the Master Plan 2003 Update, Building E has been eliminated. Building 21 and its waste marshalling, treatment, storage, and shipping facilities will be retained at the existing site. Medical/pathological waste marshalling functions now conducted in Building 25 would be moved to a replacement facility built in the vicinity of Building 21. Although not listed in Table 4-2, the Master Plan proposes upgrading Building 21 during the planning period.

- East Quadrangle

Only four buildings will be located in the East Quadrangle on the north side of Building 11 under the Master Plan 2003 Update instead of five proposed in the 1995 Master Plan. Building sites H and I are proposed as potential laboratory sites. Site J/K would house general support services in a new Research Services Building.

- South Quadrangle Revisions

Planning for the South Quadrangle on the south side of Building 11 has undergone minor revisions in configuration and proposed building function from the 1995 Master Plan. The Loop Road has been shifted northward along the southern section of the quad. The Animal Research Center (ARC) has also been shifted northward to 1995 Master Plan Site O, so that it becomes the building defining the southern edge of the Quad. Building O has been eliminated. Building M, which was previously designated as a general support services building in the 1995 Master Plan, would now be used as a research building.

- Parking

The updated Master Plan continues to emphasize relocation of surface parking to multiple level parking structures (MLPs), particularly those spaces in the buffer zone along the campus periphery. The Master Plan 2003 Update provides for additional needed parking consistent with the potential increase in campus population. This is accomplished by increasing the number of spaces in MLP-9 at the site proposed in the Northwest Sector Amendment, and at MLP-10, MLP-C, and MLP-D at their 1995 Master Plan locations, to accommodate the potential increase in buildout campus population (18,000 in the 1995 master Plan, 22,000 in the 2003 update.).

One new MLP is proposed to handle further increases and relocation requirements. MLP-E would be located on the south side of the Building 41 and the new Animal Research Center. It would be built into the hillside so that several decks would be below ground level on the south side. It would replace surface parking proposed for this area in the 1995 Master Plan.

- Building Site R

The National Library of Medicine (NLM) is located in Building 38 and 38A in the southeast sector of the campus. Its statutory mandate is to apply its resources broadly for the advancement of medical and health related sciences. Open to the general public, the library has the largest collection devoted to a single scientific discipline, i.e. medicine, in the world. It also maintains over 40 information or data bases accessible by computers around the world as well as conventional material resources. The Master Plan Update provides space for a potential addition to the NLM on Building Site R.

4.7.2 No Action Alternative

Normally, the No Action Alternative is defined as no net growth in employees and facilities from baseline conditions. However, it would be unrealistic to expect no action whatever over the two decade planning horizon. Changes can occur in response to Congressional actions, or revisions to building and safety codes. It is assumed under the No Action Alternative that NIH would maintain and repair facilities in response to these requirements.

The No Action Alternative also includes those projects to which NIH is committed by past actions by NIH or others. The status of these “committed” projects range from allocated Congressional budget funding, through design and construction, to near readiness for occupancy. The No Action Alternative assumes that all the projects listed in Table 4-3 are committed to the point that they will be built and occupied or go into service.

Future conditions for the Magnuson Clinical Research hospital and Building 10 are ambiguous in the No Action case. The existing facilities are inadequate in terms of modern laboratory space and internal utility services although improvements have been made under the Essential Maintenance and Safety Program to maintain reasonable operational levels.

Construction of the new Clinical Research Center implies a commitment to renovation of the old clinical center in Building 10. Stabilization and renovation does not necessarily add personnel, but is essential to resolving operational problems. For the No Action case, it has been assumed this will occur.

<u>Building No.</u>	<u>Building</u>	<u>Change in gsf</u>	<u>Total gsf</u>
	Existing		7,360,734
65	Family Lodge	26,500	7,387,234
62A	Children's Inn Expansion	34,000	7,421,234
35	Neuroscience Research Center, Phase I	265,000	7,686,234
3	Convert Lab to Office	0	7,686,234
--	Hatfield Clinical Research Center	1,050,000	8,736,234
6C	Lab Addition	16,500	8,752,734
--	Commercial Vehicle Inspection Facility	6,719	8,759,453
-	Gateway	20,528	8,779,981
--	Gateway Garage	0	8,779,981
33	Research Facility	150,000	8,929,981
--	MLP-9	0	8,929,981
--	MLP-10	0	8,929,981
10	Stabilization and Renovation	0	8,929,981

TABLE 4-3 NO ACTION ALTERNATIVE PROJECTS.

Additional conditions and assumptions made to define the No Action Alternative are given below.

- Personnel

The 2003 campus population is 17,511. Under the No Action Alternative, the employee population would increase to an estimated 17,900, or by about 400. Most of this increase would be attributed to Research Building 33, which is projected to house about 290 new personnel. Researchers who would occupy the Neuroscience Research Center, Phase I, would transfer from other NIH facilities on campus. However, an estimated 50 new workers would be employed in the new dining center, which is included in Phase I. There would be no net change in personnel involved with the Building 10 renovation. The remaining 60 personnel would be divided among No Action Alternative projects individually make small or no contributions to employee growth.

- Space

The No Action Alternative projects would increase the occupiable space on campus by an estimated net 1,569,000 gsf. About two-thirds of this growth, 1,050,000 gsf, would be attributable to the new Mark Hatfield Clinical Research Center hospital and associated clinical research facilities.

- Utilities

Committed and necessary projects would be implemented. The chilled water plant would continue through the Phase II expansion. Installation of Chillers 26 and 27 is now underway. Building 34, the auxiliary chilled water plant, would remain in service. On the boiler side, the COGEN/Boiler 6 would go into service, as in the Master Plan Alternative, and be sufficient to meet No Action building growth. The No Action Alternative would also include construction of the South Pond. Other utilities would be maintained as necessary.

- Parking

In general, parking under the No Action Alternative would continue in the current configuration of surface lots and Multiple Level Parking (MLP) structures. However, changes would occur. MLP-9 would be built, and MLP-10 would be built to replace surface lot parking that would be lost through construction of Building 33 and the Commercial Vehicle Inspection Facility. It is assumed that spaces would be adjusted at undesignated locations around the campus to maintain a 0.50 parking space per employee ratio. The 350 space parking garage at the Gateway Center for campus visitors would also be built. Internal campus visitor spaces would be reduced.

- Access and Security

It is also assumed that the security perimeter projects would be implemented.

4.8 Off Campus Development

The leadership of the Institutes and Centers, were interviewed separately as part of 1995 Master Plan development. Nearly all ICs stated that their programs should be kept or brought together at one place, preferably on the central campus in Bethesda. The ICs cited examples of the research and grant personnel, then in locally leased space, who were out of daily contact with their intramural and other colleagues, and research in fields other than their own. Off-campus NIH researchers lamented the lack of opportunities that foster innovative scientific inter-relationships and collaboration, and of the frustrations of going to the main campus for meetings, seminars or other business because of the productive time lost to travel between NIH facilities.

Of utmost importance to nearly all ICs, however, is the perpetuation of the heart of intramural research at NIH Bethesda with its Clinical Research Center. Nearly all Institutes have research programs in Building 10. The intramural research scientists consider the proximity of their laboratories to patients to be at the core of their success in rapidly converting research findings into actual recommended medical care practices, and they anticipate continued or increased presence in the Clinical Center and the research laboratories associated with it. The critical mass of personnel and facilities in intramural clinical research at NIH Bethesda, which revolves around the Clinical Center, must be preserved either at the main campus, or by a clinical research capability with associated adjacent laboratories at a new location.

For the Master Plan 2003 Update, the IC leadership was reinterviewed in the programming process to obtain information for space and personnel projections. They reaffirmed the importance of relationships between the ICs on campus and the proximity of laboratories, clinical research center, and support facilities to one another in conducting efficient and effective research. They noted the current trend for ever increasing collaboration among the Institutes and Centers on research programs, as exemplified by the Neuroscience Research Center which will house researchers from ten Institutes, and where support facilities will be shared in common. Similarly, the concept behind the recently built Vaccine Research Center cuts across old organizational boundaries with representatives from different Institutes working together.

Each IC was asked independently about the direction and potential growth in research within their IC. Projections for the next five years can be made with some assurance; long term projections over the 20-year planning horizon are less certain. When the range in values given by the ICs are combined and analyzed, the projections exceed what can be accommodated on the Bethesda campus within current constraints. Given the facility advantages present at NIH Bethesda and identified by the ICs, the Master Plan update recognizes that the best use of the campus is maximization of intramural research functions. Laboratories will comprise most of the future growth in space. Only essential support that must be

located on the campus for its proper function is proposed. When site and transportation constraints are considered, a campus population ceiling of about 22,000 is established.

Future NIH off campus facilities in the region could be located in scattered or consolidated leased spaces, on a new campus, or in some combination of these options. The issue involved in off campus facilities are complex. They are dependent on the location, size, nature, of each facilities as well as the surrounding environment in the vicinity. The Bethesda campus is the focus of the Master Plan and this Environmental Impact Statement. Issues involving off campus facilities are beyond the scope of these documents. Changes in off campus facilities would be covered by associated planning and environmental studies and documentation prepared at the appropriate time during the decision making processes for these changes.

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