

Chapter Two
Introduction and Program
Requirements



2.1 Introduction

The National Institutes of Health (NIH) is the focal point of the federal government for health research and is one of the world's foremost biomedical research institutions. The NIH mission is to discover new knowledge that will lead to better health for all. To achieve that mission, nearly eighty percent of the total NIH budget is expended in the form of peer-reviewed, competitively-awarded research grants, cooperative agreements, and contracts to nearly 50,000 principal investigators at more than 1,700 institutions across the country including universities, medical schools, and hospitals. In addition, some 2,000 research projects are conducted in the NIH intramural laboratories and at the NIH Clinical Center. Research is conducted at both the basic and clinical levels, encompassing studies related to the prevention, diagnosis, treatment and cure of the many diseases that afflict the men, women and children of the world. In addition, the basic research supported by NIH provides the foundation for the nation's pharmaceutical and biotechnology industries. As one measure of the agency's excellence in research, it should be noted that NIH-supported investigators won over 107 Nobel Prizes from 1939 to 2002.

2.2 Authorization & Applicability

The approved NIH 1995 Master Plan and EIS were supplemented by Amendments to the Master Plan and EIS in June, 1999.

This NIH Master Plan 2003 Update and the accompanying Environmental Impact Statement (EIS) are prepared pursuant to the policies contained in NCPC's Master Plan Submission Requirements. (Approved September 6, 1984 and amended November 7, 1985 and November 3, 1994).

Other federal regulations applicable to this NIH Master Plan 2003 Update and EIS are listed in Appendix A.

2.3 Purpose and Scope of the NIH Master Plan 2003 Update

The most recent Master Plan for the Bethesda campus was approved in 1996. The plan was amended in 1999 to accommodate development changes in the Northwest Quadrant of the campus. Since then, continued growth on and off the Bethesda campus has resulted in a need for further revisions to the campus Master Plan. As stated in the 1995 Master Plan, NIH intends to update the Master Plan at approximately five year intervals. This Update, although delayed by the NIH response to national security needs, is in keeping with that intention.

Late in 1992, NIH began the process of developing a new 20-year Master Plan. Campus population projections were derived from exhaustive interviews of the NIH Institutes, Centers and Divisions and campus needs were identified. A draft NIH Master Plan and EIS for the Bethesda campus were prepared and submitted for agency and public review in fall 1993. Traffic and other environmental concerns were raised by the community and the staffs of NCPC and M-NCPPC due to the population used for campus planning. In March 1994, following fundamental policy changes at the NIH and in the federal government, the draft Master Plan and EIS were withdrawn from the public review process. The NIH began a comprehensive review of the basic assumptions of

the Master Plan to incorporate Administration and NIH policies related to streamlining efforts, and to provide for an enhanced involvement of the neighboring communities.

At the request of Congress, an External Advisory Committee was formed in late 1993 to review the role, size, and cost of the NIH intramural research program in view of prospective downsizing of the government and proposals to balance the federal budget. The Committee reviewed NIH intramural research policies, procedures, as well as facilities. Four options for the renewal of the Clinical Center Complex were considered, including the Total Replacement Facility. The External Advisory Committee concluded that construction of a new inpatient hospital on a smaller scale than previously proposed in the 1993 Draft Master Plan, and renovation of the remainder of the Clinical Center was more realistic than a total replacement. The committee report was published in April 1994.

After further consultation between NIH and high level government officials, it was determined that NIH faced personnel and budget constraints in the intramural research program, at least through the turn of the century.

All the above mentioned factors prompted significant changes in the direction of the Master Plan. Growth of the campus population in the next twenty years was therefore anticipated to be limited by mandated reductions in staff through the year 2000, offset by a small growth largely from consolidation of intramural staff on campus from locations off-site. The total increase of personnel on campus over the next 20 years was anticipated to be not more than 10% over the 1993 population of 16,350. This was the population premise for the 1995 Master Plan.

In actuality, campus employment has grown faster than previously anticipated. Over the decade, Congress and two Administrations have provided increased support for NIH programs at unexpected high levels. This has resulted in a growth of personnel on the Bethesda campus - despite increased leasing of off-campus space, to 17,639 in 2000 - a level expected in the 1995 Master Plan to be reached nearer to 2020.

In order to accomplish the NIH mission, it is imperative that NIH update its long range master plan to continue to address the issues of facility requirements, prudent land use, planning and orderly future development. This need has become even more critical in light of key projects and programs, planned, underway, or soon-to-be-completed including the Clinical Research Center (CRC), the Clinical Center renovations, new laboratories in the Neuroscience Research Center (Building 35), Laboratory Building 33, a new Fire Station (Building 51), the Family Lodge (Building 65), an addition to the Children's Inn (Building 62) and expansion of the Central Utilities Plant, (Building 11).

The objective of the NIH 1995 Master Plan and this 2003 Update is to provide a format for the reasoned and orderly development of the Bethesda campus that values and builds on existing resources, corrects existing deficiencies and meets changing needs through new construction that renews obsolescent facilities through renovation, and attempts to set forth implementation priorities and a logical sequencing of planned development.

It is not intended to be a specific design and construction program, but rather a framework within which design and construction can occur for actual projects over four phases in the next twenty years as the programmatic needs upon which the plan is based arise. Nor does it attempt to anticipate unpredictable budgets, or congressional and presidential priorities and mandates. The objective has been to base the Master Plan solely on the NIH's best estimate of where the science is going on the premise that the more inclusive the plan, the more receptive it will be to a variety of future development possibilities.

The ongoing pressures on campus facilities often mandate acquiring space before the federal construction appropriations process can be completed; the NIH's leasing of local off-campus NIH workplaces, therefore, will continue. The NIH is in the process of conducting a study of its strategies for locating and funding off-campus facilities simultaneously with this Update of the Master Plan for the main campus. The relationship of the main Bethesda site to these leased facilities and the NIH Animal Center (NIHAC) in Poolesville, Maryland, required a coordinated, broad assessment of future strategies and resulted in development simultaneously of a new Master Plan in 1996 for the NIHAC. Similarly, research activities at outlying installations such as the NCI Frederick facility at Fort Detrick, Maryland; the NIEHS facility at Research Triangle Park, North Carolina; and the NIAID Rocky Mountain Laboratories at Hamilton, Montana, have necessitated a coordinated planning effort to integrate future NIH programs and best utilize the Bethesda campus and these other NIH installations.

This NIH Master Plan 2003 Update has been developed for a 20-year planning period, beginning in 2003 and personnel and space estimates have been organized into four phases covering a twenty year period. The NIH intends to continue to update its master plans as required, at approximately five-year intervals.

2.4 Historic Overview and Background

2.4.1 Early Public Health Initiatives

The origins of the NIH, and the federal government's involvement in public health issues, can be traced to the mid-nineteenth century in America. Today, the NIH, located on a 310-acre campus in Bethesda, Maryland, continues to serve the nation by providing state-of-the-art research and patient care facilities.

Because little was known about medicine or scientific methods in the eighteenth century, the Constitution includes no provisions for federal government involvement in public health. Although government provisions were made for marines and U.S. Navy officers and seamen in 1798-99, the health issues of the public were largely ignored. From the time the nation was founded through the early nineteenth century, illness was considered to be primarily an individual concern. When epidemics struck communities, local leaders would often form temporary committees to deal with the crises. By the mid-nineteenth century, as immigrants poured into America, slum conditions in major cities were thought to be the cause of many diseases and conditions. Squalid conditions encountered by troops and their effects on the soldiers' health during the Civil War also contributed to what was at the time termed "sanitary science."¹

In 1872, various interested parties formed the American Public Health Association. Members hoped to assist the federal government in establishing a national bureau that would promote knowledge of the most recent advances in sanitary science. Other organizations, such as the American Medical Association, were also promoting a similar idea, citing the need for a central agency that could coordinate public health programs and provide funding and broad dissemination of knowledge.²



U.S. Public Health Service

¹ Victoria A. Harden, *Inventing the NIH: Federal Biomedical Research Policy, 1887-1937*, Baltimore and London: The Johns Hopkins University Press, 1984, pp 9-10.

² *Ibid.*, p. 11.

2.4.2 Establishment of the National Institutes of Health



Dr. Joseph J. Kinyoun

Following the devastating yellow fever epidemic in the Mississippi Valley in 1878, Congress established a National Board of Health, which was the first government institution to award grants for medical research. However, the Board was short-lived, lasting only until 1883, when its appropriation expired. After a lapse of several years, the Marine Hospital Service (later renamed the Public Health and Marine Hospital Service) established the Hygienic Laboratory in 1887 in Staten Island, New York, with the express purpose of studying bacteriological disorders such as cholera. While the focus of the initial research was on disorders affecting seamen, the Laboratory assumed a large responsibility in 1890 for common ailments among the immigrant population.³

After four years, in 1891, the Hygienic Laboratory needed additional space for research and moved to Washington, D.C., in offices across from the U.S. Capitol. However, in 1895, once again more space was needed and the Laboratory moved to the Old Naval Observatory at 25th and E Streets, NW, a five-acre parcel that provided space to keep research animals. During this time, the Laboratory work focused on infectious diseases because of their powerful threat to public health.

In 1912, the governing agency of the Hygienic Laboratory, the Public Health and Marine Hospital Service, was renamed the Public Health Service, indicating that the primary concern of the agency was the public's health and well-being. Throughout World War I, research concentrated on the needs of military troops, but the public benefit of the research was also a goal.

Realizing the importance of the work of the Hygienic Laboratory, Congress passed the Ransdell Act in 1930 which designated the Laboratory as the National Institute of Health (NIH). Authorized to construct research facilities and create a system of research fellowships, the program at the NIH expanded rapidly, and space for conducting experiments as well as additional facilities to house experimental animals was needed.

2.4.3 NIH Moves to Bethesda

The philanthropy of Luke and Helen Woodward Wilson, who made a series of land donations to the federal government between 1935 and 1948, proved the catalyst for the NIH's move to Bethesda, Maryland, and its subsequent development into one of the world's leading biomedical research institutes.

During the Depression, in the mid-1930s, the Wilsons expressed an interest in donating a portion of their estate to the federal government, if a worthy use could be found. The Wilsons were directed to the National Institute of Health, which was then searching for a farm site on which to raise animals for research purposes. Initially, the new campus at Bethesda was meant to be simply one animal unit building, leaving the main research functions in Washington, D.C.⁴



Tree Tops, the Luke I. Wilson Estate

The Wilsons considered the proposed use in light of the impact it would have both on their remaining property and on the region. The Bethesda community was almost unanimous in its opposition, long having fought encroachments that would compromise the prestige of the area. Nonetheless, the Wilsons stood by their conviction and in August 1935 donated 45 acres of land, consisting of the southern portion of their

³ Ibid., pp. 12-13

⁴ Dorthey Pugh, "The National Institutes of Health," excerpted from *The Montgomery County Story*, 1987, p. 3

estate, to the United States of America.⁵ By coincidence, a few days later the Social Security Act was signed into effect providing, among other things, \$2 million per year for the “investigation of disease and problems of sanitation.” Since the Wilsons’ original offer, senior officials at the Public Health Service had held the idea of moving the entire operation of the National Institute of Health out to Bethesda from its limited facilities in Washington, D.C. With the newly expanded emphasis on research supported by the Social Security Act and the enthusiasm of the new Surgeon General, Dr. Thomas Parran, approval was gained for a major building program on the new Bethesda campus. Therefore, the strategy and plan for the NIH campus was expanded before a single building had been erected.

The Public Health Service estimated that it would cost approximately \$2,500,000 to construct an administration building, laboratory buildings, field offices, quarters for officers and attendants, a sewage disposal plant, road construction and necessary landscaping. On June 22, 1936, a total of \$1,363,000 was appropriated for the construction of three buildings for the National Institute of Health at Bethesda. The funds were appropriated by the Emergency Construction of Buildings Act of June 22, 1936. Initial architectural sketches and space requirements for the expanded research center were begun within a month, and ground was broken for the new campus in February 1938. The first three buildings included the Administration Building (Building 1), an Industrial Hygiene Laboratory (Building 2) and a Public Health Methods and Animal Unit Building (Building 3). The buildings were occupied by the National Institute of Health by December 1938.



James A. Shannon Building

The leading architect for this project was Louis Adolphe Simon, at that time acting as Supervising Architect of the United States Treasury Department, an organization with which he was associated from 1896 to 1944. He was known for his severe and very conservative Colonial Revival-style structures.

Out of concern for the unique nature of the site and following the neighbors’ protests over the nonresidential nature of the new NIH site in Bethesda, the National Capital Park and Planning Commission (now NCPC) involved itself with the design of the buildings. Frederic Delano, Chairman of the National Capital Park and Planning Commission, sent a letter in December 1936 to the Supervising Architect of the Treasury requesting that the Treasury Department employ a “high-grade consulting architect” to be in charge of this highly visible and important commission.

To fill this need, the Supervising Architect hired John Winthrop Wolcott as consulting architect. He was a Consulting Architect with the United States Treasury Department from 1933 to 1937. Mr. Wolcott later joined the noted architectural firm of Skidmore, Owings & Merrill in 1944, and formed his own practice, Finney, Wolcott & Associates in Baltimore, Maryland, from 1947 to 1955.

Mr. Delano later wrote on January 4, 1937 that, “in addition to the architectural problems involved there are difficulties in designing the approaches and fitting the buildings to the topography, which in this locality is quite rough,”⁶ and requested the further assistance of a notable landscape architect to assist in the design of the project. Alfred Geiffert of the Landscape Architecture firm of Vitale and Geiffert, Gilmore D. Clarke, was hired to consult on the project. Mr. Geiffert is described as “one of eminent and national consultant capacity,”⁷ and apparently was used often by the Supervising Architect of the Treasury as such.

⁵ Land Records of Montgomery County.

⁶ Letter from Frederic Delano to Wayne C. Taylor, dated January 4, 1937.

⁷ Notes by H.M. Boudier, dated February 13, 1937.

2.4.4 Construction of Early Buildings

The Surgeon General of the Public Health Service, Thomas Parran, was heavily involved in the concept and design of the first buildings at NIH. Very early in the process, he reflected on the anticipated use of NIH and the space needed. Initially, there were no plans for a separate administration facility. Instead, each Institute would have a set amount of laboratory and office space. Included in this estimate were the Industrial Hygiene Laboratory (with most space planned for labs), which was to be Building 1; Building 2 would contain Child Hygiene, Dental Studies, Heart Disease, Malaria, Milk and Dermatoses units, which would require an equal amount of laboratory and office space; and finally, Building 3 was necessary for Epidemiology, Public Health Methods and the Statistics division, which had a unique need for consolidated “tabulating space.”⁸



Building 6

Building 6 was authorized as a separate appropriation in August 1937, when legislation was passed commissioning the construction of the National Cancer Institute (NCI). Using land donated by Helen Wilson, construction on Building 6 was begun soon after the funds were approved. The NCI building was occupied by NIH staff in 1939 and, until recently, continued to accommodate some activities of the NCI.

In June 1938, just six months into the first phase of construction at NIH, legislation was passed authorizing the construction of two additional buildings and the Officers' Quarters at NIH. Buildings 4 and 5 were completed in 1941, just in time for intensive research into the diseases which plague soldiers during wartime. Building 4 initially housed the research activities of the predecessors to the National Institute of Arthritis and Metabolic Diseases, while Building 5 housed the divisions which would later become the National Institute of Allergy and Infectious Diseases.

Building 8, completed in December 1946, was erected to house the expansion of the NCI staff, and over the years has served as overflow space for every Institute at the Bethesda campus.

Each of these buildings has the same very distinct design of institutional, brick, Georgian Revival architecture. Buildings 2 and 3 are identical brick structures. Buildings 4 and 5 were also identical, and were created with nearly the same design as Building 6 to expedite contracting for Buildings 4 and 5.

2.4.5 Research and Growth at NIH

During World War II, research at the NIH focused on the war effort, much as it had during World War I. Much of the new medical research and information disseminated during this period was connected with NIH, which was given bureau status within the Public Health Service in 1943. Although NIH was still responsible for much of the research relating to infectious diseases, its scope was enlarged to include fundamental medical research into cancers, heart conditions, stroke, and mental illness.⁹ To reflect the diversity of NIH research, it was renamed the National Institutes (plural) of Health in 1948.¹⁰ The Rocky Mountain Laboratory in Hamilton, Montana and the Biologics Control Laboratory, formed in 1902, merged with NIH's Division of Infectious Diseases and the Division of Tropical Diseases in 1948 to form the National Microbiological Institute which has been succeeded by the National Institute of Allergy and Infectious Diseases (NIAID). The Rocky Mountain Laboratories remains an active NIH/NIAID facility. It is one of the NIH facilities conducting biodefense research.

⁸ Letter from Thomas Parran to the Supervising Architect, dated July 14, 1936.

⁹ J.E. Rall, "Epilogue," in *NIH: An Account of Research in Its Laboratories*, London: Academic Press, 1984, p. 537.

¹⁰ *National Institutes of Health 1995 Master Plan*, Chapter 2, p. 6

Over the second half of the twentieth century, NIH continued to expand, with new Institutes and programs established in response to public health demands. The Clinical Center, NIH's research hospital which once had 500 inpatient beds, was dedicated in 1953, the same year the Public Health Service became part of the newly established Department of Health, Education, and Welfare. The Bethesda campus itself continued to expand as well, with land acquisitions eventually reaching 310 acres, the present size of the site.

The 1960s was a decade of unprecedented growth for NIH. In 1962, the prestigious Library of Medicine moved to the NIH campus. Furthermore, land was acquired in Baltimore and Poolesville, Maryland, and in Research Triangle Park, North Carolina, for additional research and animal holding space.¹¹

Expansion within the Bethesda campus has also continued with the construction of new medical research and support facilities and the incorporation of pre-existing buildings such as the Wilson Estate, the George Freeland Peter Estate, and the Convent of the Sisters of the Visitation. Current construction continues to provide accommodations for patients, researchers, medical professionals, and support staff.

Each new building established on the Bethesda site represents a further commitment to medical research and national involvement in the health field. NIH is now part of the Department of Health and Human Services, and the campus currently houses 27 medical Institutes and Centers, each with its own mission.

2.4.6 The Warren Grant Magnuson Clinical Center

The Clinical Center was authorized by Congress on July 1, 1944, and construction funds were appropriated in 1948 for what was to become Building 10.

Dr. Jack Masur, Director of the Clinical Center from 1948 to 1951, who participated in the planning and construction of the building, explained its concepts in an article for the Journal for the American Hospital Association:

In the basic planning the Public Health Service and the Public Buildings Administration sought to design a laboratory-hospital building which would provide twice as much space for research laboratories as for direct care of patients; afford proximity of scientific investigators and clinicians for free interchange of ideas and knowledge; localize the basic science and clinical research laboratories and nursing units for one disease category on each floor for a coordinated team approach.

Building 10 originally comprised 1.2 million gross square feet of space and housed all patient care and clinical research functions. It was originally distinguished by the double-"Lorraine"-cross floor plan. A curved solarium bay element protrudes from the center at the southern elevation to vertically bisect the building. It provides a distinct image toward the southern portion of the campus.

Although Dr. Masur explained, "The most desired elements were utility and flexibility to meet the ever-changing requirements of laboratory research, patient care and administrative practices," the tremendous advances in technology and biomedical research since then put pressures on the building which could not have been forecast even by the visionary planners. Major additions such as Building 10A, built in 1959 to house surgery and now the central vivarium, the Ambulatory Care Research Facility (ACRF), built in 1980 along with an underground parking structure for approximately 1,555 cars, and countless interior modifications have attempted to adapt the building



Stone House, Home of George Freeland Peter



The Warren Grant Magnuson Clinical Center

¹¹ Ibid.

to new demands. Currently, the Clinical Center Complex comprises a total of 2,385,000 gross square feet (not including 560,000 gsf of garage).

Following the completion of the 1995 Master Plan, the NIH began construction of an 1,050,000 gross square foot addition to the Clinical Center, the Mark O. Hatfield Clinical Research Center, which is planned to be completed in 2004. The agency is also pursuing a multi-stage renovation of vacated and/or obsolete areas in Building 10 which is planned for completion in approximately ten years. The Clinical Center Complex continues to be the focus of intramural clinical research at the NIH.

2.5 The NIH Organization



Claude D. Pepper Building



The NIH is a component of the U.S. Department of Health and Human Services (DHHS). The NIH is composed of the Office of the Director and 27 Institutes and Centers (ICs) all of which either conduct or support scientific research. The ICs are managed and coordinated by the Office of the Director, NIH. The following is a list of the Office of the Director components:

The Office of the Director (OD)

The NIH Director provides overall leadership to NIH activities in both scientific and administrative matters. Although each Institute within the NIH has a separate mission, the NIH Director, appointed by the President and confirmed by the Senate, plays an active role in shaping the agency's research agenda and outlook. With a unique and critical perspective on the mission of the entire NIH, the Director is responsible for providing leadership to the Institutes for identifying needs and opportunities, especially those involving multiple Institutes. The OD includes the following functions:

Research Funding and Coordination

The Office of Extramural Research

Provides guidance to the research Institutes on the development and management of extramural (grant, cooperative agreement, and contract) research and training programs.

The Office of Intramural Research

Coordinates, implements, and provides scientific direction and authority over NIH intramural research policy and programs.

Policy and Communications

The Office of Science Policy

Advises the NIH Director and immediate staff on science policy, strategic planning, program planning and evaluation, health economics, legislative analysis, technology transfer, and special programs, and represents the NIH in these areas to the Department and Congress.

The Office of Legislative Policy

Advises the NIH Director, Deputy Director, OD staff, and the ICs on the full range of legislative issues, and provides leadership and direction for NIH legislative analysis, development, and liaison.

The Office of Communications

Plans and directs activities to communicate information about NIH programs and accomplishments to the general public, the scientific community, the medical

profession, and public advocacy groups.

The Office of Community Liaison

Advises the NIH Director and the Deputy Director on policies, programs, and issues involving the NIH and its community.

Administration and Services

The Office of Management

Advises the NIH Director and staff on all phases of NIH-wide administration and management.

Executive Office

Serves in both a staff and operational capacity for all administrative support activities for the Office of the Director, excluding the Office of Research Services.

The Office of Equal Opportunity and Diversity Management

Advises the NIH Director and staff on matters related to equal employment opportunity programs and policies of the NIH.

Center for Cooperative Resolution

Provides overall leadership, direction, and oversight on alternative dispute resolution (ADR) policies, programs, and activities at NIH.

Office of the General Counsel

Provides legal counsel to the Director and administers the ethics program for the DHHS.

Program Coordination

The Office of Disease Prevention

Coordinates the activities of disease prevention, rare diseases, dietary supplements, and medical applications of research.

The Office of AIDS Research

Develops a comprehensive strategic plan that identifies and establishes objectives, priorities, and policy statements governing the conduct and support of all NIH AIDS research activities.

The Office of Behavioral and Social Sciences Research

Advises the NIH Director and other key officials on matters relating to research on the role of human behavior in the development of health, prevention of disease, and therapeutic intervention.

The Office of Research on Women's Health

Advises the NIH Director and staff on matters relating to research on women's health.

Institutes

National Cancer Institute (NCI)

Conducts, supports, and coordinates research on detection, diagnosis, prevention, and treatment of cancer.



National Eye Institute (NEI)

Conducts, fosters, and supports research on the causes, natural history, prevention, diagnosis, and treatment of disorders of the eye and visual system and in related fields (including rehabilitation).





National Heart, Lung, and Blood Institute (NHLBI)

Provides leadership for a national program in diseases of the heart, blood vessels, lungs, and blood, blood resources, and sleep disorders.



National Human Genome Research Institute (NHGRI)

Provides leadership for and formulates research goals and long-range plans to accomplish the mission of the Human Genome Project, including the study of the ethical, legal, and social implications of human genome research.



National Institute on Aging (NIA)

Conducts, fosters, and supports biomedical and behavioral sciences research and training pertaining to the aging process and related health fields.



National Institute on Alcohol Abuse and Alcoholism (NIAAA)

Conducts and supports biomedical and behavioral research, health services research, research training, and health information dissemination with respect to the prevention of alcohol abuse and alcoholism and the treatment of alcoholism.



National Institute of Allergy and Infectious Diseases (NIAID)

Conducts, fosters, and supports research and research training programs directed at finding the cause of and improved methods for diagnosing, treating, and preventing immunologic and infectious diseases.



National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

Provides leadership for a national program in the major disease categories of arthritis and musculoskeletal and skin diseases.



National Institute of Biomedical Imaging and Bioengineering (NIBIB)

Conducts, coordinates, and supports research, training, dissemination of health information, and other programs with respect to biomedical imaging, biomedical engineering, and associated technologies and modalities with biomedical applications.



National Institute of Child Health and Human Development (NICHD)

Conducts, fosters, and supports biomedical and behavioral research through research grants, research contracts, and research performed in its own laboratories on: child health, maternal health, problems of human development with special reference to mental retardation; and family structure, the dynamics of human population, and the reproductive process.



National Institute on Deafness and Other Communication Disorders (NIDCD)

Conducts, fosters, and supports research and research training on the causes, prevention, diagnosis, and treatment of deafness and other communication disorders.



National Institute of Dental and Craniofacial Research (NIDCR)

Conducts and coordinates research to improve and promote craniofacial, oral, and dental health.



National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

Provides leadership for a national program in the three major disease categories of diabetes, endocrinology, and metabolic diseases; digestive diseases and nutrition; and kidney, urologic, and hematologic diseases.

National Institute on Drug Abuse (NIDA)

Provides national leadership and conducts and supports biomedical and behavioral research, health services research, research training, and health information dissemination with respect to the prevention of drug abuse and treatment of drug abusers.

**National Institute of Environmental Health Sciences (NIEHS)**

Conducts, fosters, and coordinates (in its own laboratories and through contracts, grants, and support of Environmental Health Sciences Centers) research and research training on the biological effects of chemical, physical, and biological substances in the environment.

**National Institute of General Medical Sciences (NIGMS)**

Administers, fosters, and supports research in the basic and general medical sciences and in related natural or behavioral sciences which have significance for two or more Institutes, or are outside the general area of responsibility of any other Institute.

**National Institute of Mental Health (NIMH)**

Provides leadership for a national program to increase knowledge and advance effective strategies to deal with problems and issues in the promotion of mental health and the prevention and treatment of mental illness.

**National Institute of Neurological Disorders and Stroke (NINDS)**

Conducts, fosters, and supports research and research training on the causes, prevention, diagnosis, and treatment of neurological and muscle disorders.

**National Institute of Nursing Research (NINR)**

Provides leadership for nursing research and supports and conducts research, research training, and dissemination of results to build a scientific base for nursing practice and patient care and promote health and ameliorate effects of illness on the American people.

**National Library of Medicine (NLM)**

Assists the advancement of medical and related sciences through the collection, dissemination, and exchange of information important to the progress of medicine and health.

**Centers****Center for Information Technology (CIT)**

Provides leadership for the determination of NIH computational and telecommunications needs at all levels and oversees the development of appropriate infrastructure support to meet identified needs.

**Center for Scientific Review (CSR)**

Provides staff support to the Office of the Director, NIH, in the formulation of grant and award policies and procedures.

**John E. Fogarty International Center (FIC)**

Provides leadership in the development and conduct of research programs to improve the health of the people of the United States and of other nations through international cooperation, research, and research training in the biomedical sciences.





National Center for Complementary and Alternative Medicine (NCCAM)

Studies the integration of alternative treatment, diagnostic and prevention systems, modalities, and disciplines with the practice of conventional medicine and as a complement to such medicine and the integration of such alternatives into health care delivery systems in the United States.



National Center for Minority Health and Health Disparities (NCMHD)

Advises the NIH Director and Institute and Center Directors on the development of NIH-wide policy issues related to minority health disparities research, research on other health disparities, and related research training and serves as principal liaison with other agencies of the DHHS, and federal government.



National Center for Research Resources (NCRR)

Administers, fosters, and supports research for the development and support of multi-categorical research resources needed on an institutional, regional, national, or international basis for health-related research.



Warren Grant Magnuson Clinical Center (CC)

Provides patient facilities and services for clinical investigations in the Clinical Center. (See also 2.4.6 above.)

2.6 The Master Plan Goals and Objectives

This NIH Master Plan 2003 Update maintains the 1995 Master Plan goals to provide a realistic and orderly phased development of the Bethesda campus in furtherance of the mission of the NIH - *Science in pursuit of knowledge to improve human health*. This means pursuing science to expand fundamental knowledge about the nature and behavior of living systems; to apply that knowledge to extend the health of human lives; and to reduce the burdens resulting from disease and disability. The NIH seeks to accomplish its mission by:

- fostering fundamental discoveries, innovative research, and their applications in order to advance the nation's capacity to protect and improve health;
- developing, maintaining, and renewing the human and physical resources that are vital to ensure the nation's capability to prevent disease, improve health, and enhance quality of life;
- expanding the knowledge base in biomedical and associated sciences in order to enhance America's economic well-being and ensure a continued high return on the public investment in research; and
- exemplifying and promoting the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.

The Master Plan supports these mission implementation strategies with the following planning goals and objectives:

GOAL 1

Foster innovative research strategies designed to advance the nation's capacity to improve health.

- Establish a comprehensive and coordinated approach to physical development of NIH that is based on cost-effective, incremental options for growth while ensuring orderly development of the campus.
- Stimulate interaction and communications among scientists and staff to enhance quality of research and opportunities for interdisciplinary collaboration through adjacency of uses and creation of formal and informal meeting and gathering spaces on campus.

- Create a flexible development plan that will allow for changing program needs in the future.
- Consider potential impacts of changes in technology and advances in research processes.

GOAL 2

Provide a physical framework for the changing nature, character and urgency of medical research and education.

- Establish a comprehensive and coordinated approach to physical development at NIH that will ensure the orderly growth of NIH facilities.
- Develop building sites, open space, and transportation and circulation systems that will ensure appropriate campus facility utilization, functional land use and efficient accommodation of future program requirements.
- Identify short, mid, and long-term opportunities for phasing and implementation of the proposed policies and plans.
- Enhance campus function, efficiency and character through better definition of land use and functional relationships.
- Establish a coordinated land use strategy for the campus integrating plans for functions at off-campus sites.
- Define overall development capacity.
- Identify patterns of existing development and factors which potentially limit future development.
- Define an achievable development strategy.



View Towards Convent

GOAL 3

Provide a secure and supportive environment for the people involved in NIH activities, including scientists and professional/administrative staff, visitors and other non-NIH users, patients and their families, and residents and students.

- Provide appropriate campus amenities such as child care, recreational resources, fitness facilities, convenience retail, etc.
- Facilitate the security, safety and well-being of those who work, visit, or reside at NIH by constructing site perimeter barriers, effectively screening for contraband and mitigating vulnerabilities through campus and building design.
- Enhance the quality of the research and work environment and overall campus quality.
 - Preserve the integrity and build upon the character of the NIH campus.
 - Provide guidelines for improving the quality of landscaping, open space, and architectural compatibility at NIH.
 - Provide accessibility to campus facilities for persons with disabilities.
 - Improve and enhance the pedestrian environment and linkages, and create a pedestrian scale within the larger site.
 - Preserve and enhance structures with established historic and cultural value, and protect and document important archeological finds.
 - Develop a recognizable system of landscape that enhances the quality and character of the campus.
 - Increase the ease of orientation and direction-finding around the campus.
 - Improve pedestrian and bicycle movement on campus.
 - Define and communicate building character and scale to achieve a perceivable and attractive identity
 - Provide for the convenience and safety of employees and the neighborhood through site lighting and security.



Louis Stokes Research

GOAL 4

Enhance and respect the stability and integrity of the surrounding residential community.

- Conserve, enhance, and increase the campus perimeter buffer zones, especially bordering the residential areas.
- Coordinate with and respond to various regulatory and review agencies.
- Engage the NIH, local agencies, and the community in an active dialogue concerning Master Plan premises and concepts by the establishment within the Community Liaison Council of Task Groups to work with NIH staff and consultants during development of the Master Plan Update.
- Establish the scale and height of future NIH facilities so that they have no adverse impact on adjoining neighborhoods or cultural resources.
- Minimize future construction near the adjoining residential neighborhoods.
- Protect adjoining neighborhoods from intrusion of NIH traffic, parking, noise, and intrusive lighting.
- Endeavor to ensure that the NIH and its activities do not contribute to security or safety issues in adjoining neighborhoods.
- Foster effective transportation solutions to minimize traffic and parking problems both external and internal.

GOAL 5

Protect the natural resources and environmental qualities of the NIH campus and the region.



The NIH Stream

- Identify and build upon the unique environmental qualities of the campus and enhance existing landscaping and vegetation.
- Maximize the use of public transportation and shared transportation, and reduce the use of the single occupancy vehicle.
- Enhance campus design to encourage greater NIH employee use of bicycles and walking as commuting modes.
- Improve and enhance bikeways and bicycle circulation on the campus.
- Promote energy efficiency.
- Improve management of storm water runoff quality and quantity above minimal State requirements, where possible.
- Reduce noise in adjacent residential areas caused by campus sources.
- Improve facilities for storage and handling of hazardous materials.
- Encourage environmentally sound development sensitive to surrounding neighborhoods and responsive to optimizing the campus' close proximity to the Bethesda Central Business District.

GOAL 6

Use the Master Plan to foster communication about NIH goals and policies.

- Encourage active dialogue among NIH management, the scientific community and the NIH staff, to foster a better understanding of the ramifications of proposed policies and plans.
- Encourage continuing active dialogue among NIH and the surrounding community as well as local, state, and federal agencies to work together on issues that affect the community and region.

2.7 Planning Methodology/Format

This NIH Master Plan 2003 Update consists of six chapters. Chapter 1 is the Executive Summary. Chapters 2, 3 and 4 are oriented toward establishing background and broad guidelines, while Chapters 5 and 6 deal with specific development recommendations.

Chapter 1 - Executive Summary

Chapter 2 - Introduction and Program Requirements

This Chapter provides background and organizational information, defines the approach to the Master Plan Update, establishes the planning premises and identifies programmatic requirements in terms of personnel and physical facilities. It discusses the relationships between the NIH Bethesda Campus Master Plan and other long range NIH planning activities. It also places the Master Plan Update in the context of the federal government-wide focus on enhancing physical security at its facilities.

Chapter 3 - The Community Context of the Bethesda Campus

This Chapter provides an overview of the regional setting, places the Bethesda campus in the context of existing and future land use patterns and discusses critical relationships among the Bethesda campus and off-campus sites. It discusses the context of Bethesda-Chevy Chase, the Bethesda Central Business District, the Washington-Baltimore Metropolitan Area and the Master Plan 2003 Update's relationship to local and regional plans. The context is updated to reflect the latest NIH statistics and, where available, data from the 2000 Census and other official sources. Important aspects of the regional transportation systems, utility services, population and economy, cultural assets, and other research facilities are identified.



Library of Medicine

Chapter 4 - Existing Conditions on the Bethesda Campus

The existing resource analysis determines the major development features on the NIH campus. Natural and man-made elements which affect potential uses, such as physical features of the site, climate, environmental features, existing land use, utilities, historic/archaeological features, amenities and visual quality, and constraints and opportunities are identified. Changes to the existing conditions since 1995 are documented.

Chapter 5 - The NIH Master Plan 2003 Update for the Bethesda Campus

This Chapter outlines the specific objectives, concepts and standards for future development, land use, buildings, utilities, open space, circulation and traffic management for the next twenty years.

While primary emphasis in the plan update is placed on clarifying long-range development patterns, short- and mid-range opportunities are also identified. Sufficient refinement is provided to determine the character and significance of these projects.

Chapter 6 - Development Guidelines

This part presents specific site element recommendations that will improve overall campus continuity and character, including guidelines for density, bulk, circulation, walks, furniture, lights, signage and landscaping generally as originally provided in the 1995 Master Plan. It also reaffirms policies and procedures for implementing and controlling development in accordance with the goals and objectives of the Master Plan.

2.8 Summary of Program Findings

2.8.1 Introduction

As part of this update, functional and personnel needs over the next 20 years that were projected by Institutes, Centers (and former Divisions) for the 1995 Master Plan, in responses to the questionnaire and interviews of key personnel, were revisited through new interviews and questionnaires. A copy of the questionnaire used is included in Appendix B. New personnel projections were also made by the current Institutes and Centers. Space needs for buildings not yet in the programming or planning stages were estimated based on the personnel projections. The projections are based on the



William H. Natcher Building

scientific programs and missions of the Institutes and Centers and were not limited by expectations of funding or future priorities.

The expected down-sizing of federal government agencies in the early 1990s did not materialize at the NIH. To the contrary, congressional and administration support of NIH programs over almost a decade has actually resulted in a growth of personnel that approximates projections by the ICs for the 1995 Master Plan. Therefore, the year 2000 campus population of 17,681 and 2003 population of 17,511, validated the original projections but defied the effects of restraints on government growth assumed in the 1995 Master Plan. These restraints led to the assumption that the Bethesda campus would not grow beyond a population of 18,000, even by 2020.

While the Master Plan 2003 Update provides a framework to accommodate the estimates for growth and change in campus population and facilities over the next 20 years, actual development on campus will, as always, depend on future congressional and presidential policy decisions, as well as federal budgetary constraints. Also, vast changes in national health policy are expected to continue over the next decade as they did over the previous one, and NIH's mission could be significantly affected as a result. The Master Plan Update continues to provide guidance on how change and development would take place on the Bethesda campus, when and if it occurs over the next 20 years and beyond.

Using the structure of the 1995 Master Plan findings and those coming from the latest questionnaire and interview responses, the following summarizes the findings:

2.8.2 Mission

Institutes generally can be categorized by the orientation of their funding of biomedical research:

- by disease; for example, the National Cancer Institute (NCI); the National Institute of Allergy and Infectious Diseases (NIAID); or the National Institute of Neurological Disorders and Stroke (NINDS). In recent years, NIH has developed "Centers" for research on a disease or disorder where multiple ICs participate, such as the Neuroscience Research Center and the Vaccine Research Center. Future centers are also planned.
- by body organ or system; for example, the National Heart, Lung and Blood Institute (NHLBI); the National Eye Institute (NEI); or the National Institute of Dental and Craniofacial Research (NIDCR).
- by population group; for example, the National Institute on Aging (NIA); the National Institute of Child Health and Human Development (NICHD); or the National Institute on Drug Abuse (NIDA).
- by research discipline; for example, the National Institute of General Medical Sciences (NIGMS); the National Human Genome Research Institute (NHGRI); or the National Institute of Nursing Research (NINR).

The , NHGRI, mentioned above, is an Institute created not long ago from a former Center. Three Institutes returned in late-1992 to the NIH from their affiliation with the former Alcohol, Drug Abuse and Mental Health Administration (ADAMHA); these are the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute of Mental Health (NIMH), and the National Institute on Drug Abuse (NIDA).

Centers provide services to the Institutes. For example, the Warren Grant Magnuson Clinical Center (CC) and the Mark O. Hatfield Clinical Research Center (CRC) will provide the environment for clinical researchers in the intramural research programs of most Institutes. The National Center for Research Resources (NCRR) has the

multidisciplinary resources to biomedical investigators across the spectrum of research activities supported by the NIH.

The Office of the Director of the NIH (OD) provides general management and policy direction for the NIH as well as specific services such as procurement, planning, design, construction, maintenance and operations.

Most ICs anticipate that changes to their missions will be minor in the foreseeable future, except as new avenues of research may be revealed or as public or congressional pressure may dictate. Advances in technology and major emerging public health concerns may also influence future mission definition such as has already been the case for the Human Genome, Neuroscience, AIDS vaccine, and women's health programs.

2.8.3 Organization and Programs

The most significant organizational feature of most Institutes - for purposes of master planning - is their division into intramural and extramural research functions. Intramural research is performed by NIH scientists in NIH facilities, whereas extramural research is done under NIH grants, cooperative agreements, and contracts by other researchers in other institutions nationwide. Centers may be similarly divided or may have organized their services to the Institutes to correspond to the extramural/intramural functions.

All ICs have an Office of the Director which requires convenient access to the corresponding offices of the other ICs and to the Office of the Director of the NIH. All of these have offices on campus, generally in Building 31, including the Director of NIEHS and the Director of NIA. Most of NIEHS' staff is at Research Triangle Park in North Carolina, while most of the NIA staff is in Baltimore, Maryland.

Most Institutes have strong relationships between their Director's office and their intramural program and typically feel the need for both to be centered at the Bethesda campus while extramural programs can continue to be located off campus.

Extramural programs account for the preponderance of institute research budgets - about 80% of a \$27.2 billion NIH budget in FY '03.

Nevertheless, it is almost unanimously felt that the intramural basic and clinical research programs are what distinguish the NIH as an institution from all others in biomedical research. NIH intramural research enjoys unique interdisciplinary character, flexibility of the course of the research and the freedom to pursue research without imposition of pre-determined duration or, in some instances, scope. With the Clinical Center, patients are physically close to researchers, and the rapidity with which clinical trials of research findings can be applied is unique in biomedical research. The grant funding of extramural research, on the other hand, requires advance definition of objective, duration and cost, and grantee institutions often cannot access patients for clinical trials with the alacrity found at the NIH Bethesda campus.

The relationships between each IC's intramural and extramural programs vary. Most ICs however, require that extramural scientific personnel keep in touch with their intramural colleagues and scientists of other ICs as a matter of staying current with scientific progress. Intramural scientists may, at times, also be a resource to extramural grant personnel in evaluating the scientific merits of research proposals and in coordinating research in allied areas.



Neuroscience Research Center Phase I

2.8.4 Locations and Proximities

On the matter of what functions should be located on the Bethesda campus, nearly all ICs, given the choice, expressed a preference that most of their intramural research programs remain on the Bethesda campus or be relocated to the campus from currently leased locations. Extramural research grant administration personnel, most of whom are now in locally-leased space, are generally comfortable with their off-campus situation, but a few complained of intellectual isolation, lack of opportunities that foster innovative scientific interrelationships and collaboration, and the frustrations of going to the campus for meetings, seminars, or other business because of the time taken to travel between NIH facilities, the limited parking at the Bethesda campus, and the need for dependency on shuttle services. Some sites such as Research Court near Shady Grove and the NIHAC in Poolesville are not served by shuttle service because the NIH presence in those locations is too small and the demand insufficient to make shuttles economical or workable.

Of utmost importance to nearly all ICs was the perpetuation of the "heart" of NIH - the Clinical Center Complex - with the associated intramural clinical and basic research conducted by nearly all Institutes. See 2.8.7 below for further discussion.

A number of programs are already established elsewhere for reasons related to those locations such as the National Institute on Aging (NIA) at the Baltimore Gerontology Research Center (GRC) and the National Institute on Drug Abuse (NIDA) at the Baltimore Addiction Research Center (ARC). Both of these will be consolidated into a new NIH Bayview Research Center in Baltimore -a long term commitment to the location. Portions of the NCI and to a lesser degree, NIAID are located at NCI Frederick; behavioral and neuroscience research by NICHD, the NEI, and the NIMH are permanently located in Poolesville, Maryland; NIAID has a long standing presence in Hamilton, Montana where a new BSL4 laboratory dedicated to biodefense research is planned. The NIEHS is entirely located in Research Triangle Park, North Carolina.

2.8.5 Training

Training biomedical research personnel is a major part of the NIH mission, and training programs exist in most ICs within both intramural and extramural programs. On the Bethesda campus extensive seminars, lectures, and conference programs conducted within all ICs generate a need for conference space. There was consistent need expressed by ICs for conference space of 50-100 persons for training and continuing education programs, lectures and seminars, as well as large conference facilities. Some of this need has been addressed with the construction of the William H. Natcher Building, and by new buildings such as Building 40 (the Dale and Betty Bumpers Vaccine Research Center) and Building 50, the Louis Stokes Research Building, which have small conference centers on their ground floors available to NIH as a whole. The increased proportion of NIH employees off campus requires more of these facilities near their users.

2.8.6 Animals in Research

Animal use in research by the intramural programs is extensive at the NIH which has one of the largest veterinary resource programs for research anywhere. For intramural research, animals are scattered among buildings on the Bethesda and Poolesville campuses, in some locally-leased space, and in Frederick, Baltimore and other satellite installations. To one degree or another, most Institutes procure, house, breed and manage some inventory of their own animals, while other animals are under the management of the Division of Veterinary Resources (DVR). Although all NIH animal

facilities are accredited by the American Association for Accreditation of Laboratory Animal Care (AAALAC), replacement of the campus' sprawling and aging Building 14-28 Complex with a more modern and compact structure housing common functions such as procedure, holding and isolation facilities in an Animal Research Center (ARC) is planned for occupancy in the second development phase of the campus. Fewer large animals are being used in biomedical research in most programs, and scientists strongly prefer having the smaller research animals near the laboratory whenever possible. Newer laboratories at NIH, such as Buildings 40, 49, and 50, reflect this in their design.

Because of severe infrastructure and environmental constraints on further construction at the NIHAC in Poolesville and the requirement to keep a number of animals as near the laboratories as possible, it does not appear feasible or desirable to transfer laboratory activities from Bethesda to Poolesville only to be near the animals that are there. However, enhancements to the research already there are desired. Specialized animal holding facilities, and improved laboratories for a modest increase in the number of biochemists, immunologists and neurobiologists could be supported in furtherance of the neuroscience focus at the NIHAC. Quarantine facilities for newly acquired animals should remain in Poolesville and other NIH installations.

2.8.7 The Clinical Center Complex

The Clinical Center Complex (CCC) continues to play a major role in the missions of nearly all Institutes. Except for the NIEHS which plans to conduct research in the CCC in the near future, and the NIDA, all Institutes have research programs in the Clinical Center Complex. The intramural research scientists consider the proximity of their laboratories to the patients to be at the core of their success in bringing research findings into more rapid applications, and they anticipate continued or increased presence in the Clinical Center. All Centers likewise serve the Clinical Center except the National Library of Medicine (NLM), the National Center for Research Resources (NCRR), the Center for Scientific Review (CSR) and the John E. Fogarty International Center (FIC).

The newer ICs, the National Center for Complementary and Alternative Medicine (NCCAM) and the National Center for Minority Health and Health Disparities (NCMHD), the National Institute of Biomedical Imaging and Bioengineering (NIBIB), do not have programs in the Clinical Center Complex at this writing.

The completion of the Mark O. Hatfield Clinical Research Center will occur in 2004 when the facility becomes home to new inpatient units, day hospitals and research labs. Together, the existing Warren Grant Magnuson and Hatfield Centers will serve a dual role –providing the environment that today's clinical researchers need for advancing clinical science as well as a setting for humane and healing patient-care .

The Clinical Research Center, named in honor of Senator Mark O. Hatfield of Oregon, who supported medical research throughout his career in Congress, will promote translational research –process of transforming laboratory research into applications for the benefit of patient health and care. This “bench-to-bedside” proximity in the new Clinical Research Center provides a crucial link in rapidly moving biomedical findings in the laboratory into the mainstream of medical practice.

The new center will connect to the existing Warren Grant Magnuson Clinical Center, which opened its doors to patients in 1953. The 1,050,000 gross square foot complex plans to open with 240 beds and 90 day-hospital stations. This arrangement can be easily adapted to allow more inpatient beds and fewer day-hospital stations or vice versa, as the new facility's design is highly flexible. The facility is designed to facilitate



*Silvio O. Conte Building
Building 49*



*Mark O. Hatfield Clinical
Research Center*

interaction and collaboration among the clinicians and researchers. Their work will clearly benefit from this new structure. The ultimate beneficiaries, however, are undoubtedly the patients and families who receive the care and cutting-edge technology that is the expected signature of the NIH.

2.8.8 Growth

The support of current and past Administrations as well as Congress over the past decade has overcome a slower campus growth rate than anticipated in the early 1990s. As a result, the NIH has received funding and support that has contributed to increasing local NIH employment to over 26,000 and the campus to 17,511. The primary growth at the campus is expected to be in intramural research personnel.

The growth in personnel on campus has not been matched by the addition of new space, so the NIH has continued to seek space on the commercial market where the NIH currently leases approximately 3.2 million square feet of space at thirty locations in the Montgomery County, Maryland area. The leases cover 13 of the 18 Institutes, 4 of the 6 Centers, and the Office of the Director.

Following is a summary of Population Trends in Local NIH Facilities:

Year	Bethesda/Rockville Area Population	Campus Population		Population in Locally Leased	
1993	21,583	16,350	76%	5,233	24%
1995	21,309	16,326	77%	4,983	23%
2000	24,155	17,617	73%	6,538	27%
2003	26,141	17,511	67%	8,630	33%

Although IC personnel projections for the campus, based on the interviews, exceed 22,000 in the aggregate, the Master Plan Update is based on a campus population ceiling of 22, 000 based on several factors:

While NIH can maintain its peak hour trip generation at or below 1992 levels to meet the Memorandum of Understanding with planning agencies conditions at higher campus population levels, 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 on 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 buildings with independent heating and cooling systems could be built, such systems would not have the same operating reliability and efficiency, nor cost effectiveness.

The NIH has, therefore, determined that the practicable capacity of the Bethesda campus is 22,000 persons at this time, and the balance of any growth beyond this level will have to move off campus to locally-leased or other types of facilities. If the NIH needs to change the employee population basis of its planning for the Bethesda campus, it will initiate a new master plan and NEPA process.

Figure 2.8.8 Bethesda Campus Growth

	Building Numbers	Description of Event	Change in	Total	Total
			Occupiable Area (Gross Sq Feet)	Occupiable Area (Gross Sq Feet)	Personnel Capacity
1995 Master Plan				7,036,700	
Changes and corrections up to Year 2000:			-146,668	6,890,032	17,617
Existing (completed prior to Dec. 31, 2003)	10	NMRs	11,135	6,901,167	
	50	Louis Stokes Research Building	290,000	7,191,167	
	40	Vaccine Research Center - Phase I	84,600	7,275,767	
	64	East Child Care Center	21,000	7,296,767	
	11	Power Plant Phases I and II	82,400	7,379,167	
	35	Demolish Building 35	-50,463	7,328,704	
	63	Substation	10,030	7,338,734	
	51	Fire Station	22,000	7,360,734	
	11	Building 11 Cogeneration	0	7,360,734	
		Remove Surface Parking Lots 31 C, D, E, G and J	0	7,360,734	
	3	Begin renovation of Building 3	0	7,360,734	
Current Existing				7,360,734	17,511
First Phase	65	Family Lodge	26,500	7,387,234	
	62	Childrens Inn Expansion	34,000	7,421,234	
	35	Neuroscience Research Center (NRC) - Phase I	265,000	7,686,234	
		Perimeter Fence + Gates	0	7,686,234	
	10	Clinical Research Center	1,050,000	8,736,234	
	MLP-10	MLP-10	0	8,736,234	
	MLP-9	MLP-9	0	8,800,758	
		Remove Surface Parking Lots 31F and 31H	0	8,736,234	
	66A	CVI - Commercial Vehicle Inspection Facility	6,719	8,742,953	
	10	Building 10 Core Renovation - Patient Care Units, Floors 2-13, out-of-service	-297,756	8,445,197	
	36	Demolish Research Building 36	-236,285	8,208,912	
	66	Gateway Center (Visitor Center/Visitor Vehicle Inspection Station)	20,528	8,229,440	
	MLP-11	Gateway Center MLP-V	0	8,229,440	
	33	Research Building 33	150,000	8,379,440	
	6C	Addition to Building 6	16,500	8,395,940	
	10	Building 10 Renovations - no additional space.	0	8,395,940	
	35	Neuroscience Research Center (NRC) - Phase II	335,000	8,730,940	
	10	Building 10 Central Core Project, Transition Program and Penthouse	49,227	8,780,167	
	3	Complete renovation of Building 3	0	8,780,167	
	29/29A	Reassign Research Buildings 29A and 29B	0	8,780,167	
	10	Renovate Building 10 E&F Wings	-147,000	8,633,167	
	NW CC	Northwest Child Care Center	21,000	8,654,167	
	T-39	Demolish T-39 Fitness Center	-5,160	8,649,007	
	25-Rep	Construct Replacement for Building 25 near Building 21	12,000	8,661,007	
	(22,22A,25)	Demolish 22, 22A, 25	-20,255	8,640,752	
	T-23/T2	Demolish Building T-23	-5,871	8,634,881	
	End of First Phase				8,634,881
Second Phase	ARC/42 (14/28)	Animal Research Center Demolish Buildings 14/28,18,32	335,000 -288,071	8,969,881 8,681,810	
		Southern Loop Road	0	8,681,810	
	M	Research Building M, South Quad	178,500	8,860,310	
	11	Building 11 Phase III Expansion (Boiler 7; Chillers 26-29)	35,000	8,895,310	
	40	Vaccine Research Center - Phase II	50,000	8,945,310	
	N	Research Building N, South Quad	137,700	9,083,010	
		MLP C, South Quad	0	9,083,010	
	10	Building 10, Reoccupy E & F Wings	444,756	9,527,766	
		Remove Portions of South Surface Parking Lot 41B/T1 and 41C	0	9,527,766	
		MLP E - Phase I	0	9,527,766	
	10A	Demolish Building 10A	-56,000	9,471,766	
		Demolish MLP-7	0	9,471,766	
	R	Addition to the National Library of Medicine	389,370	9,861,136	
	(12,12A,12B)	Demolish 12, 12A, 12B	-156,236	9,704,900	
		MLP E - Phase 2	0	9,704,900	
	P	Research Building P, South Quad	183,600	9,888,500	
		Remove Remaining Portions of South Surface Parking Lots 41B and 41C	0	9,888,500	
(34-34A)	Reassign Building 34/34A (Campus Center)	0	9,888,500		
End of Second Phase				9,888,500	19,951
Third Phase	29	Demolish Building 29	-89,949	9,798,551	
		MLP D, Central Mall Parking	0	9,798,551	
	7, 9	Demolish Research Buildings 7 and 9	-81,360	9,717,191	
		Central Mall	0	9,717,191	
	J/K	Building J/K - Research Services	212,175	9,929,366	
	-13	Demolish Building 13	-212,690	9,716,676	
	(T14)	Demolish T14	-4,000	9,712,676	
	(T46)	Demolish T46 - Child Care Center	-3,000	9,709,676	
	-30	Demolish Research Building 30	-93,940	9,615,736	
	I	Research Building I	249,900	9,865,636	
G	Research Building G	112,200	9,977,836		
F	Research Building F	149,600	10,127,436		
End of Third Phase				10,127,436	20,409
Final Phase		Remove Surface Parking Lot 45 (Natcher)	0	10,127,436	
	Q	Office Building Q (Natcher Addition)	190,000	10,317,436	
	D	Research Building D	168,700	10,486,136	
	H	Research Building H (includes decompression of existing Research Buildings)	229,500	10,715,636	
End of Final Phase				10,715,636	21,878

The ICs themselves identified many stimulants to growth over the history of the NIH such as new public health concerns, new technologies and new avenues of research such as the human genome. All ICs agreed that limitations of funding, staffing and space restrict growth.

Though future areas of research are difficult to predict, research is either investigator-initiated or congressionally-mandated in response to public concerns. A certain level of prioritization, therefore, comes from the public, the Congress, and the White House. Since all Institutes receive their own appropriations, congressional priorities are, of course, reflected in the budgets provided to the ICs. There is an element of unpredictability as to what may occur, but usually according to the ICs, the public's and Congress' concerns and priorities are coincident with their own.

Table 2.8.8 Shows the phased construction that could accommodate a campus population of up to 22,000 over a period of twenty years.

2.8.9 Long Range Plans

Nearly all of the ICs have formal long range strategic plans in place or under development, and these can be viewed on the individual IC web sites through <http://www.nih.gov/about/NIHoverview.html>.

2.8.10 Technology

Biomedical research is technology intensive, and, in addition to complex scientific and medical technologies, all components of the NIH use computers extensively. The Center for Information Technology (CIT) not only provides one of the computer mainframes central to the NIH, it also assists many ICs in computer use, training, adaptation of off-the-shelf software and development of new applications. It also provides computer services to 30 other federal agencies. The degree to which information technology has become a central part of research at the NIH is seen by the wide range of services provided by CIT to the research community:

- Applications Support
- Application Hosting
- Computing Services
- Desktop User Services
- Networking and Telecommunications
- Research and Scientific Support
- Web Resources

Videoconferencing technology has evolved to a standards-based architecture whose potential is being exploited throughout NIH to improve processes, save time and money, attract higher level review participation, and increase the exchange of information. Videoconferencing has removed some of the inconvenience of the scatterings of NIH employees throughout the region. Current applications include grants reviews, Executive Officer meetings, staff meetings, town meetings and special events originating from NIH auditoriums. In-progress and planned applications include telemedicine videoconferencing between the Clinical Center and research institutions for NIH medical trials and Center for Scientific Review grant reviews that currently require 450 two-day meetings of 15 participants each, plus travel time.



NIH Fire House

The Natcher Building Conference Center, with its state-of-the-art technology in two rooms equipped for this purpose, will further facilitate and expand the use of videoconferencing.

Robotics applications are already apparent in molecular biology labs in gene sequencing. The expansion of robotics as a research aid was not predicted by the ICs to be significant, but the use of robotic bio- pharmaceutical manufacturing of new drug therapies for trials and robotic surgical procedures, is already in limited use, and could continue to increase and become a subject for research at the NIH.

2.8.11 Functional and Operational Relationships

Relationships Within Each IC

The most important organizational considerations within most ICs are the intramural/ extramural relationships and the relation of their Offices of the Director (ODs) to these programs. Most ICs place a premium on locating their Directors in proximity to the intramural program, but at the same time close to the Office of the Director of the NIH and to other IC ODs.

Relationships Between ICs

There are many complex interrelationships between and among the ICs. For the most part, scientists with Institutes and some Centers conduct and/or support investigator-initiated research and any congressionally mandated research on both clinical and basic issues, while certain Centers such as the Clinical Center and CIT and one Institute, the National Institute of Biomedical Imaging and Bioengineering (NIBIB), provide research support in many forms to the Institutes and other Centers. The Centers do, however, conduct their own research, and many collaborate with Institute scientists. In addition, all ICs provide consultative services in areas of expertise within the Clinical Center where most Institutes have laboratories and most Centers provide services or have a presence. Many of the collaborations and parallel investigations are most effective on the Bethesda campus where researchers have access to the Clinical Center and to each other.

Cross-Institute or multi-Institute research has recently resulted in a new facility, Building 35, the Neuroscience Research Center, now under construction, which will consolidate this research in a single facility.

2.8.12 Campus Quality



*Mary Lasker Woodard
Center Garden Wall*

The interviews for the Master Plan 2003 Update asked personnel of each IC to address quality of life issues on the Bethesda campus, such as the character of the site; the size, character and location of buildings; the availability of places offering opportunities for socialization and collegiality; and facilities for recreation, child care, elder care and dining.

Findings show that these issues directly affect the NIH on two levels: individually, through morale and productivity, and collectively, by the ability of each IC to achieve its mission by being able to compete with academia and industry for the best research talent. Most persons interviewed appreciate the landscaping and other natural features of the site and regret the loss of much of this to surface parking. The construction of several new multi-level parking structures is realizing the goal of restoring the campus buffer zones to landscape. Concerns about inadequate site lighting and poor site way-finding that did not serve patients, contractors and other visitors to the campus well, will be addressed by the NIH in a campus streetscape master plan.

Another important issue raised by all ICs concerned amenities both on and off campus. There is a lack of adequate, convenient, attractive and reasonably priced dining facilities on campus and at many leased facilities, though newer buildings, such as Building 40, the Vaccine Research Center, have included small “cyber cafes” to supplement the larger, traditional cafeterias on campus. More such places would provide increased opportunity for scientists to meet informally and benefit from better awareness of each other’s pursuits. An environment that encourages this kind of collegiality is necessary for exchanges of ideas.

Additional physical fitness centers, dispersed throughout the campus, would help accommodate some of the personal health and recreational needs expressed by many IC staff. Although many commercial fitness centers are available in retail areas such as the Bethesda CBD, Rockville Pike area, and elsewhere, NIH - the nation’s icon of health, should have available, convenient, comprehensive fitness facilities such as are now provided in most academic and many industrial campuses.

Conference facilities, ranging in size from an occupancy of 20 to 100 persons and located adjacent to office area, are required to facilitate the normal course of business. More of these have been provided since the 1995 Master Plan in newer buildings, including Buildings 40 and 50, and in extensive renovation programs. Two large auditoriums in the Clinical Center, a floor of conference rooms in Building 31C and the

state-of-the art conference center in Building 45, the William H. Natcher Building, provide excellent large and medium scale facilities for campus-wide and community conference and presentation purposes. Extramural program offices located in locally-leased space have been able to include much-needed conference space.

One of the most important demands on the extramural programs is the conferencing needs of the Advisory Councils which now meet mostly in the existing conference rooms in Building 31C and the Wilson Hall in Building 1. Many of these require seating of 100 - 150 persons, plus public and media attendees. The large auditoriums in the Natcher Building and Building 10 are not suitable because of their arrangement and excessive size, while the conference spaces in the Natcher Conference Center are not appropriate because they are not large enough. Besides, the Natcher Building is booked heavily for other purposes. Off-campus locations at hotels, etc. can be and are used, but this is not satisfactory since it removes the entire operation from the campus or the host IC's programs. The Advisory Councils meeting to review extramural grant programs are mandated by statute and occur each year during three, 6 - 7 week periods (i.e., from late-May to early-July; mid-January to end of February, and early-September to mid-October). These must be convened during the same period for all 27 Institutes and centers, all competing for the space now available. When the conference rooms in Building 31 undergo renovation, all of the conferences will need to be off-site probably in hotels, and the demands will be intensified. Timing of these conferences is extremely important and any delays can have a ripple effect on the legislative and grant award/fiscal year calendars.

Convenience amenities, such as a bookstore, dry cleaner, quick market and fast food retail outlets were also mentioned as amenities that would be welcomed on the Bethesda campus and at other NIH employment centers.

NIH is preparing guidelines for development of adequate amenities for all employees.

2.8.13 Parking and Transportation

Of all the Bethesda campus site issues, parking and transportation remain a source of dissatisfaction to personnel from every IC as well as to all types of visitors. The issues of transportation and parking are addressed in more detail elsewhere in the Master Plan Update, but some of the points raised by the ICs will be mentioned here.

At the time of the interviews for this Update, people continued to complain that there were not enough on-site parking spaces to accommodate the number of people who must drive and therefore need to park on the Bethesda campus.

Since the interviews for the 1995 Master Plan were conducted, the Multi-Level Parking structure, 8, (MLP-8) was opened. Completion of MLP-10 and 9 in 2004 and 2005, respectively, will result in the removal of significant amounts of surface parking, and will not lead to a permanent increase in total spaces on the campus. In addition, the success of the Transportation Management Plan, including increases to the NIH TRANSHARE subsidy, has resulted in a significant decrease of peak hour trips to the campus, and decreased use of the single-occupant vehicle.

Many employees adjust their work schedules to arrive early in the morning to improve chances of finding a parking space. Although this may work for employees with regular work hours, it does not always work for the many members of the scientific community who work irregular schedules. ICs report that Intramural investigators spend, on average, between 50-60 hours per week on campus, sometimes working until the early morning hours, leaving for home, then returning to the campus at mid-day. This reflects the nature of laboratory science which knows no convenient routine. At mid-day,



Typical Surface Parking Lot

researchers reported, it required a substantial amount of time to find a parking space, if one could be found at all.

Investigators requiring travel to off-campus locations for seminars or meetings may curtail activities simply because they cannot find a parking space upon their return to the campus. Conversely, personnel working at off-campus locations with no shuttle service such as those working in Poolesville, Research Court or Baltimore find it very difficult to participate in any activity on the Bethesda campus because of the lack of transient parking. Shuttle bus service is available to most locally-leased properties and to the NCI Frederick campus, but waiting times, lengthy routes and frequent stops make the shuttle bus service unattractive to many, and the ridership is therefore unpredictable and difficult to serve efficiently. If the service is not as convenient as using the private automobile, employees will try to drive to the campus, so improved shuttle service is a constant goal of the NIH.

2.9 Summary of Site Data

The following information summarizes data gathered during the 2003 master planning effort. All areas and parking indicated as "proposed" represent what would be needed to accommodate the population used for planning purposes on the campus.

	2000	Existing (2003)	Final Phase	
Site				
Developed Area		approximately 124 Acres (40%)	approximately 102 acres (33%)	
Open Area		approximately 186 Acres (60%)	approximately 208 acres (63%)	
Population	17,617	17,511	22,000	
Building Areas (in Gross Square Feet)				
Occupiable Building Area	6,890,032	7,360,734	10,715,636	
Total Building Area including Utility and Parking Structures	11,519,081	11,989,783	12,212,611	
Changes in Areas at end of Final Phase:				
Proposed Demolition of Occupiable Area			-1,226,209	
Proposed New Construction of Occupiable Area			4,561,111	
Proposed New Construction of Parking Structures			445,842	
Parking Spaces			Proposed Off -Peak	Proposed Peak
Surface (off-street)	4,801	4,801	1,508	1,508
Structured	4,468	4,468	10,741	10,741
On-Street	87	87	406	0
Total	9,356	9,356	12,655	12,249

2.10 Planning Premises

2.10.1 Population Growth



Stone House Garden and
William H. Natcher Building

- Total population used for planning at the Bethesda campus is anticipated to be approximately 22,000 by 2020. The primary growth at the campus is expected to be in intramural research personnel.
- If the demand for research and other facilities causes the resultant population to exceed the 22,000 population planned for on campus, NIH will consider additional off-campus facilities at other NIH sites or in commercial developments.

2.10.2 Building and Land Use

- The current proportions of the three basic personnel categories at the Bethesda campus (intramural, extramural, other) has been evaluated from time to time and future ratios established as appropriate. The “intramural” category includes all personnel, both scientists and administrative staff, related to basic and clinical scientific research. The “extramural” category includes all administrative and scientific staff who administer the extramural program of each IC. The “other” category includes the administrations of NIH and each IC, and staff providing specialized support to the ICs such as NCRR, CIT, CSR, NLM and others.
- Residential use will be limited to low-density quarters and will not be expanded on-campus. The Children’s Inn is constructing an addition planned for occupancy in 2004. A new Family Lodge for adult Clinical Center patients and their families will be completed in 2004 also.
- Although not specifically identified in the program areas, employee service facilities, such as facilities for fitness and recreation, will be increased to meet guidelines now in development and distributed in convenient locations on the campus to provide for employee needs wherever it is possible to include amenities in new construction budgets. Child care facilities have been a high priority, and the East Child Care facility was completed in 2001. A Northwest Child Care Center is proposed for the Second Phase of campus development, and both have been included in the program areas.
- Similar land uses and building functions will be concentrated in adjacent areas, wherever possible, to promote efficiency and collegiality.

2.10.3 Open Space

- A continuous open space system will continue to be developed to enhance the sense of unity, order and scale on the campus. A central mall area will be created for informal as well as organized outdoor activities.
- The buffer zone around the periphery will be retained at a width of 250 feet from the NIH property line. The perimeter security elements including a fence, vehicle barriers, gates, a visitor vehicle inspection facility and parking garage, and a commercial vehicle inspection facility will be introduced in such a way to generally preserve the landscaped buffer zone. Completion of multi-level parking structures will remove extensive surface parking from the buffer zone.
- Landscaped elements of special value will be preserved and additional landscaping, signage, and street furniture will be developed to enhance the working environment under a separate campus streetscape Master Plan.
- Historic resources and their environmental settings will be respected.

2.10.4 Architectural Principles

- Future development will reflect historic patterns and priorities. Architectural policies and criteria will be developed and used to ensure compatibility with the built environment in terms of materials, style, massing, scale and color.
- Development will simplify and clearly reflect overall patterns; it will promote a sense of order, quality and unity throughout the campus. Sub-campus areas will have their own identity while simultaneously contributing to the overall campus order.

2.10.5 Transportation / Circulation

- Placement of buildings and design of pedestrian pathways and bicycle routes will favor the Metrorail/Metrobus/Ride-On station on Rockville Pike to encourage use of mass transit as much as possible.
- A well-defined road system with a primary distributor network carrying the bulk of users and a network of secondary roads providing service accessibility will be established to increase efficiency, orient the visitor and protect both open space and pedestrian corridors.
- The primary campus visitors' entry focal point will be the South Drive entrance at Rockville Pike where the Metro station is located and where a new Gateway Center for visitors will be constructed. A secondary gate for Clinical Center patients and visitors is planned at West Cedar Lane and West Drive.
- Provision of parking spaces on campus for NIH employees will continue to be integrated with the Transportation Management Plan to reduce the use of the single occupancy vehicle as a transportation mode to and from the campus. Employee parking will be located strategically inside the site in or adjacent to major building groups, but not in the 250-foot wide buffer zone. Employee parking will favor multi-occupant vehicles and disabled drivers and will provide for NIH employees traveling from other NIH sites not served by shuttle bus.
- Visitors' parking will be concentrated in a new structure in association with the Gateway Center. Clinical Center patients will be screened at the West Cedar Lane entrance to the site and will proceed to the Clinical Center parking garage where a second vehicle screening will be performed. Some additional visitor parking for vendors, contractors, and service personnel will be maintained at scattered designated locations within the interior of the campus.
- Traffic impacts of future campus development will be mitigated on the surrounding roadways serving the NIH campus to the maximum extent possible.
- Shuttle bus service will be improved to on- and off-campus sites.
- Non-NIH traffic using the NIH campus roads for through-passage between Old Georgetown Road and Rockville Pike has been eliminated since institution of perimeter access control and will continue to be restricted.
- The pedestrian character of the campus will be promoted and emphasized to employees.

2.10.6 Infrastructure

- Major deficiencies in the NIH infrastructure are being corrected in order to maintain the quality of research conducted at the NIH. This includes the generation and distribution systems, in addition to programmatic functional requirements. (See Section 2.14) Impacts of utility upgrades, such as noise, will be mitigated.
- Utility and service uses will be concentrated in one area of the campus in so far as possible.
- Future office, laboratory, and animal buildings will be designed with maximum



Building 11 - Power Plant

- flexibility/adaptability to facilitate change as science dictates.
- NIH has initiated a program to improve the sustainability of all future construction.

2.10.7 Animal Programs

- The NIH Animal Center's (NIHAC) role in the future development of the Bethesda campus was reevaluated as part of the 1995 Master Plan and the simultaneous master planning of the NIHAC.
- The Building 14/28 complex will be replaced with a more compact, Animal Research Center (ARC) and research facility, and more of the research animals will be dispersed to be nearer to the laboratories and the researchers using these animals. Still more animals may be housed off-site by contractors.

2.10.8 Management

- The NIH plans to ensure continued management awareness and involvement, and personnel participation in the implementation of the Master Plan 2003 Update.
- The Master Plan 2003 Update is based on a staff population of 22,000 on the campus.
- The NIH Office of the Director has established the Office of Community Liaison (OCL) for addressing continuing or new mutual NIH-Community concerns. The OCL supports the Community Liaison Council (CLC).

2.11 Program Premises

2.11.1 Space Programs

Existing and proposed building areas categorized by building and use type are presented in The Campus Growth Table 2.8.8.

The **Clinical Center Complex** building areas reflect no growth in overall programs and, subsequent to the 1,050,000 gsf Clinical Research Center (CRC) addition in 2004, are shown as remaining constant through all Master Plan phases, although portions of the area vacated by the patient care functions will be converted to decompressed laboratory and support spaces as part of the Building 10 renovation programs in Phases II and III of the Master Plan. The Clinical Center (Building 10) renovations phase are shown as area removed from the campus inventory and restored after renovation is complete.

Based on personnel projections, required **Office Space** is computed by applying General Services Administration (GSA) net and gross area standards of 273 gross square feet per occupant. Existing usable area is credited against the total.

Laboratory Space is computed by applying net and gross area standards (derived from an analysis of a variety of recently constructed laboratory buildings) to Intramural

Research Program (IRP) personnel projections. Again, existing usable laboratory area is credited against the total to yield the estimated total new laboratory space that will be required. The area per researcher (i.e. principal investigators, research assistants, post-doctoral students, technicians and graduate students) used in the computation is 540 gross square feet, and this includes laboratory, laboratory office, laboratory support, shared support, ancillary, animal and building gross areas.

Support Space requirements for IC components, including OD/NIH, Biomedical Engineering and Instrumentation Program (BEIP) and CIT, are from interviews with affected components. ORS/DVR space anticipates the eventual location of more animal holding facilities with research laboratories and a replacement of the Building 14/28 Complex. A proposed new Animal Research Center, will house holding and procedure rooms, certain research programs, quarantine, limited breeding, and other central support activities.

Also included in this category are security-related support facilities such as the Gateway Center for visitors and a Commercial Vehicle Inspection Facility which will complete the perimeter security system. Associated guard houses at the various gates are not tabulated in the areas.

Campus Amenities consisting of employee services and site features have been included in the Master Plan 2003 Update. These are in four categories:

The first category of amenities is in specifically programmed space. This includes the 21,000 gsf East Child Care Center and the 21,000 gsf Northwest Child Care Center. An additional child care center is planned for the Campus Center at the south end of the Central Mall. Child care has been identified by NIH as an increasingly important employee amenity. GSA standards and common practice indicate that limiting the size of each child care facility to a minimum of 74 and a maximum of 150 children is optimal, and would result in a total of three child care centers on campus.

The second category consists of uses which are not specifically programmed, but may be absorbed within the gross area allocated to space programs of major buildings. Within this group are small scale employee and business services and convenience and support retail. The employee and business services include credit unions, banking facilities, post office, express mail, etc. The convenience and support retail for weekday use includes food, books, news articles, cards, gifts, dry cleaning, shoe repair, travel agency, etc. At similar federal facilities these uses are provided at a rate of two to four square feet per employee, which would equal 50,000 to 100,000 gsf on the NIH campus, subject to availability of funding. Existing retail and employee services would be enhanced at present locations.

The third category of amenities includes facilities recommended to be built on site but not specifically programmed by space allocation. Included in this category are outdoor site amenities, such as an amphitheater to accommodate NIH ceremonies and events.

The Master Plan 2003 Update proposes renovating a portion of Building 34/34A at the south end of the Central Mall for the strategic concentration of a core of amenities within a Campus Center. The facility, similar to a "university center," would combine meeting and conference rooms, food services, selected retail, and the relocated "temporary" fitness center (T-39).

The fourth category of amenities is of an outdoor recreational nature. Included in this category are a variety of outdoor spaces for patient and employee health and use; areas for active recreation, including the retention or replacement of tennis courts in the southwest corner of the site; a campus bike path system with bicycle storage

provided in appropriate locations; a jogging/exercise path; stream area enhancements; and outdoor eating/picnic facility enhancements.

The amenities under study in the NIH Campus Amenities Guidelines include:

- Conference Centers
- Video Conference Rooms
- Dining Centers with Kitchens
- Concession Stands (to include various types and sizes)
- Coffee Bars
- Vending Machines
- Credit Unions/Banking
- ATMs
- Lactation Rooms
- Fitness Centers
- Shower and Locker Rooms
- Exercise Rooms
- Child Care Centers
- Other Retail Opportunities

2.12 Security Considerations

The NIH Bethesda campus is a federal installation, and though perhaps not as likely a target for terrorism as some other federal properties in the metropolitan area, it is, nevertheless, potentially vulnerable to various kinds of threats. The NIH campus has maintained its open, academic-like character in deference to the spirit of intellectual interaction, and access to the large public with which the ICs do business must continue. The Clinical Center receives hundreds of persons from the general public daily, as outpatients, inpatient visitors and volunteers, very much as any hospital does. Other buildings are frequented by visiting scientists, scholars, and an array of tradespeople, messengers, contractors and others throughout the business day. The campus is also the site for meetings of researchers, academicians and others.

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, former 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.

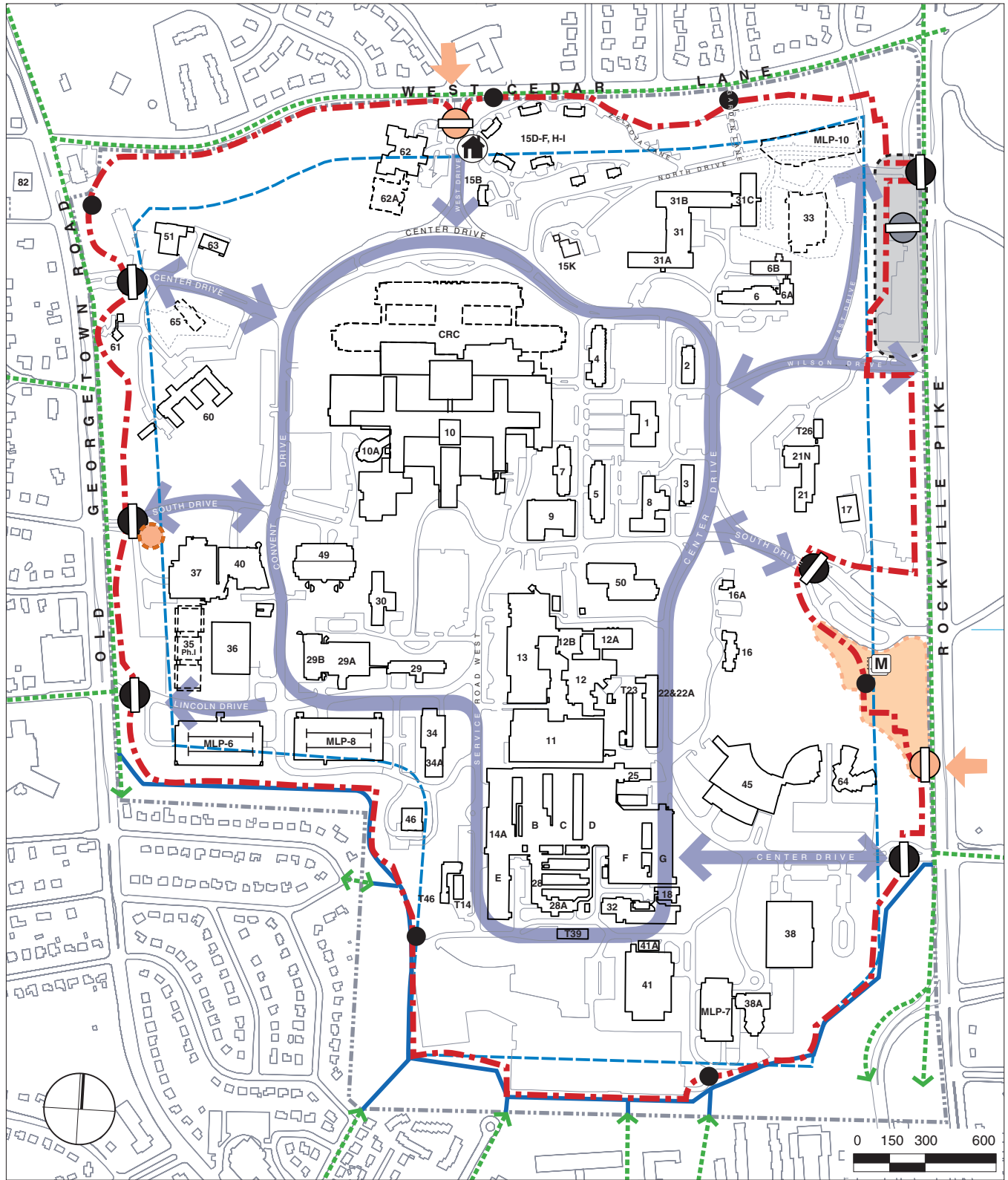
NIH developed its Security Assessment in response to the Presidential Directive in August 1995, but the absence of significant new physical security funding delayed action by nearly all federal agencies. In summer 2001, the DHHS Office of the Inspector General (OIG) reviewed the NIH Bethesda campus physical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

- improve perimeter security by: installing a perimeter fence with a limited number of controlled entry and exit points; constructing a visitors center and parking facility; installing additional surveillance and new barriers;
- improve staffing of security and construct a centralized shipping, receiving and storage facility;
- improve interior building security;
- improve security planning.

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.














The NIH is addressing all of these recommendations which are in various stages 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, and with vehicular and pedestrian gates has been completed. Gates provide access for employees on foot or bicycle at 13 points around the perimeter, and for employees in vehicles at six locations plus an 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). 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 for most visitors' vehicles. Most visitors arriving at this location will proceed to the interior of the campus after screening and walk or use internal shuttle service to their destinations. A secondary access for Clinical Center patients and their visitors arriving by foot, bicycle or vehicle is provided at West Cedar Lane and West Drive where vehicle and personal



**NIH
Master Plan
2003 Update
Bethesda Campus**

NIH / ORF / DFP

-  Visitor Access
-  Vehicle Access
-  Veh. & Service Access
-  Emergency Evacuation/Exit Only
-  NIH Residence Access
-  Pedestrian Access
-  Property Line
-  Buffer Line
-  Fence Line
-  Proposed Loop Road
-  NIH Bike/Pedestrian Path
-  Public Bike/Ped. Path
-  Proposed Building Currently Under Development

Oudens & Knoop, Architects, P.C.




-  Proposed Commercial Vehicle Inspection Site
-  Proposed Gateway Center
-  Possible Site of West Visitor Facility

Figure 2.12

**Security
Improvements Plan**

SmithGroup

screening will occur. Visitor vehicles proceeding to the Clinical Center parking garage are screened also at the entrances to the garage.

In the future, and within security constraints, pedestrian/bicycle access may be provided to the general public to permit access between the Metrorail station and the areas to the west of the campus. A screening/pass system applicable to each transit of the campus would be needed. It is expected that one gate entrances on Old Georgetown Road will be redesignated as the western portal.

- Protective barriers of various kinds against vehicle ramming have been provided at entrances and other areas of potential vulnerability
- A centralized shipping, receiving and storage facility with screening capabilities, as recommended by the DHHS OIG, has been studied for both on and off-campus locations. On-campus locations could not be found which provided adequate queuing for the volume of commercial vehicles serving the campus, adequate space for screening, receiving and storage, and at the same time, sufficient stand-off from other occupied buildings to mitigate potential blast charges that could be concealed in a commercial vehicle. Off-campus locations also could not be found that met the same requirements and could at the same time intercept vehicles coming to the NIH campus from multiple directions, especially via Interstates I-270/70 from the west and north; I-66 from the west; I-95 from both north and south and from the District of Columbia and other local points-of-origin.
- 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). Over 90% of the commercial vehicles approach the campus from the Beltway (I-495) to the north and will be able to enter the facility with a right turn. Adequate queuing space and screening operations will avoid congestion on the surrounding roads. The screening process will be integrated with the loading dock management at each destination building so that arrivals, especially at the Clinical Center, can be modulated.
- By controlling access and performing screening at the site perimeter, the NIH has been able to reopen most of its buildings' entrances to allow resumption of free passage from one to the other. Exceptions to this include critical buildings such as the central utility plant, Building 11, and the main frame computer in Building 12 which will have permanent staffed access controls.
- Improved security planning, staffing and operations has been assured by the creation of a Security and Emergency Response service cluster under the Office of Research Services in the Office of the Director of NIH.

The impact of the physical security measures - the perimeter fence, Gateway Center, and commercial vehicle inspection facility - on the Master Plan is mostly in the change in traffic patterns for vehicle accessing the campus, including a significant reduction in the on-campus traffic due to elimination of cross-campus travel. The level of restriction and screening of persons and vehicles arriving at the campus will vary in accordance with the Alert Level as established by the Homeland Security Advisory System.

The NIH Bethesda campus will retain its openness within the perimeter and will increase protective measures for buildings and other facilities to ensure the safety of the people and programs on campus and within the adjacent neighborhoods.

All physical security programs of the NIH are addressed through and by organizational entities in the Office of Research Services (ORS) Security and Emergency Response (SER) service cluster.

The SER combines emergency management, security planning and management, police, fire fighting and prevention, and crime prevention activities within a single, full-service organization which ensures that all emergency incidents are coordinated and

controlled through and by a single entity, sharing available resources to provide optimal services to the NIH nation-wide.

The ability of the NIH to deal effectively with emergencies is supplemented on the Bethesda Campus by formal mutual aid agreements with the Montgomery County Department of Fire and Rescue Service, the National Naval Medical Center Fire Department, and the Montgomery County Department of Police as well as other federal, state and local law enforcement agencies, including the U.S. Federal Protective Service and the FBI.

2.13 Relationship to the Environmental Impact Statement

The National Environmental Policy Act (NEPA) of 1969, as amended, 42 U.S.C. §§ 4321 *et seq.*, commits federal agencies to utilize a systematic, interdisciplinary approach which will ensure the integrated use of natural and social sciences in planning and decision-making that may have an impact on the human environment. Prior to major actions, alternatives must be identified and addressed, real and significant environmental issues and alternatives analyzed, economic and social impacts included in the analysis, and all environmental information made available to the public.

In view of the unique federal presence in the Washington, D.C. area, additional effort is required in the National Capital Region to implement the National Environmental Policy Act. Procedures developed pursuant to the National Capital Planning Act of 1952 administered by the National Capital Planning Commission (NCPC) prescribe the way the NCPC, beginning at the earliest possible point, considers the planning and environmental aspects of proposed actions. The Commission states that its goal is to avoid or minimize adverse environmental effects.

The 1995 Master Plan Final Environmental Impact Statement (FEIS) was prepared in accordance with these directives and is a companion document to the 1995 Master Plan. As part of the 1995 Master Plan NEPA process, scoping meetings were held with jurisdictional review agencies, the general public and NIH employees. Public hearings were held to present the Draft and Final Master Plan and environmental documents, and to invite comments and questions. The Final 1995 Master Plan and Environmental Impact Statement (EIS) were published in December 1995 and the Master Plan was approved by NCPC on February 1, 1996.

Exigencies unforeseen in the 1995 Master Plan created the need to amend the northwest sector of the plan in 1998. Design development for the Mark O. Hatfield Clinical Research Center ultimately required the realignment of Center Drive northward from its existing location. Subsequently, this required the rearrangement and reconfiguration of other building facilities proposed for the area in the northwest corner of the campus between West and South Drives. NIH prepared an Amendment to the 1995 Master Plan with an accompanying Supplemental EIS (SEIS) that covered the proposed revisions. Draft documentation was circulated to jurisdictional agencies and community organizations, and presented to and discussed with the NIH Community Liaison Council (CLC) at a series of meetings. The Final Northwest Sector Amendment and SEIS were published on August 25, 1999, and the Amendment was approved by NCPC in September 1999.

It is the intent of NIH to update the Bethesda campus Master Plan at approximately five-year intervals. NIH initiated this process in March 2000 for the Master Plan 2003 Update. Since the existing conditions and potential environmental impacts were identified in the 1995 Master Plan EIS and 1999 Amendment SEIS, and the impacts After resolution of Building 10 renovation issues that could have significantly affected the direction of site planning, environmental impact studies were initiated. The results

were expected to be of the same order of magnitude as given in those documents, scoping for the Master Plan 2003 Update was accomplished by letter inviting comment to jurisdictional agencies and surrounding communities.

of these studies are given in the Draft Master Plan 2003 Update EIS. The Draft Master Plan 2003 Update and EIS will be published and circulated to review agencies, local community organizations, and the general public for comment. A public hearing will be held.

2.14 Relationship to the NIH Master Utilities Plan

The NIH established a Facilities Revitalization Program which consists of ten interrelated programs:

- The NIH Master Plans, including the 1995 Master Plan for the Bethesda main campus, the 1995 Northwest Sector Amendment to the 1995 Master Plan, and this Master Plan 2003 Update:
 - the Infrastructure Modernization Program (IMP);
 - the Master Plan and Design Services Central Infrastructure Utility Systems Report, (MUP I);
 - NIH Bethesda Master Utility Plan, (MUP 2); and
 - NIH Central Utility System Updated Master Utility Plan, (UMUP).

- The NIH established the IMP (formerly known as the Infrastructure Modernization and Improvement Program (IMIP)) as its major infrastructure planning program. The IMP provided for the replacement and expansion of central utility equipment and the distribution systems on the NIH Bethesda campus. The IMP also provides for the programmed restoration, renovation, replacement and expansion of the campus mechanical and electrical utility systems. Specific central utility services include chilled water, steam, electrical power, compressed air, domestic water, stormwater, and sanitary sewerage and natural gas. Equipment includes chillers, boilers, control and monitoring systems, pumps, switchgear, and other ancillary apparatus.

- The 1995 Master Plan for the NIH established the growth expectations at the Bethesda campus incorporating all diverse elements. It also established building types and potential sites for future growth. The IMP interacted with the 1995 Master Plan in two basic ways. First, the IMP provided the supporting utilities for the planning framework depicted in the 1995 Master Plan and second, the IMP imposed constraints on near-term growth projected by the 1995 Master Plan.

- In order to meet the needs of this interdependency, the NIH developed a Master Utility Plan (MUP). MUP 1 was completed in September 1992 and MUP 2 was completed in December 1994. A major goal for the MUP was to develop a comprehensive and integrated plan for maintaining and improving utility services for the current, near-term, and long-term requirements of the Bethesda campus. The MUP will be used within the IMP to manage the overall infrastructure program. The MUP will have to evolve into a multi-year effort as future needs are established by the Master Plan. Four groups of tasks comprise the MUP:

Task 1 Central Plant and Site CAD Documentation: This task consolidates and documents onto a computer aided drafting (CAD) system existing utility systems and configurations.

Task 2 Central Plant Equipment and Site Distribution Condition Assessment: This task builds on the information generated under Task 1 and provides a baseline assessment of the capabilities and useful life of the existing equipment.

Task 3 Utility Systems Analysis: This task defines the existing and future utility load requirements and develops various alternatives for upgrading the systems.

Task 4 Master Utility Plan (MUP): This task summarizes the findings and provides recommendations, estimated costs, and schedules for improving and upgrading the various utility systems.

The MUP 1 emphasized central plant systems: chilled water, steam generation and distribution systems, and future electrical loads and distribution.

The chilled water, steam, and electric power utilities planning efforts have emphasized three considerations:

- Central plant system capacity requirements to provide reliable service based on current loads and future projects,
- Distribution utility capacity requirements to provide reliable service also based on current loads and future projects, and
- Utility corridor planning coordinated with the NIH overall site and building renovation and expansion plans that were presented in the 1995 Master Plan.

The MUP 2 addressed the secondary utility systems, such as domestic water, sanitary (waste water), storm, natural gas, compressed air, and electrical distribution. Detailed analysis of the current conditions and requirements of the secondary systems was accomplished in the MUP 2 planning effort. Both MUPs included estimated capital costs for the IMP and essential related projects, and construction project planning and scheduling.

Numerous physical changes have occurred at NIH Bethesda since 1995, or are currently underway. Building projects include the Building 50 Laboratory, the Building 40, (Vaccine Research Center), Laboratory Building 33, the Clinical Research Center and subsequent Building 10 renovations, the Neuroscience Research Center, Building 51 (Fire Station), Building 64, (East Child Care Center), Building 65, (Family Lodge) and Building 62A (Children's Inn expansion). Campus population has increased at a rate faster than anticipated in 1995. Similarly, on the utility infrastructure side, projects proposed in the IMP, MUP 1, and MUP 2 such as the Building 11 Phase I Chilled Water System Phase I expansion, east-west utility tunnel, north electric power substation, Boiler 5 installation, and 23 MW PEPCO COGEN unit, have been or are being implemented.

In view of these rapidly developing conditions, NIH prepared the NIH Central Utility System, Updated Master Utility Plan (UMUP), which was completed in 2000. The UMUP reassessed existing utility demands or usage and system capacities with emphasis given to the central utilities, steam and chilled water. Projections were based on the 1995 Master Plan. The UMUP also updated future major item utility needs and implementation scheduling on a concept planning basis. These projections have been further refined in conjunction with the campus Master Plan 2003 Update.

2.15 Relationship to the Clinical Research Center and Clinical Center Stabilization and Clinical Research Core Stabilization

The Clinical Research Center, on schedule to be completed in 2004, is the response to needs discussed in the 1995 Master Plan.

The Master Plan 2003 Update planning team has coordinated with the recommendations and the policies of the NIH management in the redevelopment of Building 10 following completion and occupancy of the Clinical Research Center in 2004. The intention of the Clinical Research Core Renovation program is to optimize the use of vacated space in Building 10 as modern laboratory space replacing obsolescent and sub-standard space. No consequent growth in on-campus personnel is required and none is shown in the Bethesda Campus Growth Table (Table 2,8.8).

2.16 Relationship to the NIH Animal Center Master Plan

The NIH Animal Center (NIHAC), originally named the Poolesville Animal Farm, was purchased in 1960 when it became necessary to relocate NIH farm animals from the rented Casey Farm in central Montgomery County. The new farm property was chosen because it most closely met the objectives of adequate space and essential rural privacy for NIH farm activities. It also had reasonable accessibility to the NIH Bethesda campus, combined with the practical reality of a cost low enough to be purchased with available funds at a time when the value of farms in areas closer to Bethesda had risen precipitously due to their potential subdivision value.

A Master Plan for the NIHAC in Poolesville was developed simultaneously with the 1995 Master Plan, and the two were closely interrelated. It is not anticipated that any more facilities can be placed at the NIHAC beyond those already programmed and confirmed in the NIHAC Master Plan. The site cannot be considered as a location for functions now at the main campus in Bethesda or at any of the other NIH locations.

2.17 Sustainability

NIH is in the process of completing a sustainable design initiative. This study, which was begun in 2002, focuses on how NIH can realize through the design of its buildings, its facility operations, and the policies and processes it establishes a sustainable campus environment, one that conserves natural resources and reduces pollution. Policies stemming from the Sustainability initiative are expected to be broad and comprehensive and will be applied to new and existing development within the Bethesda campus, and possibly off-campus as well. As a participant in the Federal Green Building Council, NIH complies with all federal policies and regulations related to sustainability, including Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition, and Executive Order 13123, Greening the Government Through Efficient Energy Management.

The NIH Design Policies and Guidelines, which apply to programming, planning; designing and constructing new buildings, major and minor alterations, Volume 4, Part B, "Sustainable Design," states,

"Sustainable Design decisions cross disciplines. Building products, components, and systems must be integrated and conceived holistically rather than as a series of independent decisions and components. Design decision-making must follow the goals and principles of sustainability as required by Executive Order (EO) 13123, *Greening the Government Through Efficient Energy Management*, dated June 3, 1999."