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FINAL

ENVIRONMENTAL
IMPACT
STATEMENT

REVISED MASTER PLAN
BETHESDA RESERVATION
NATIONAL INSTITUTES OF HEALTH
BETHESDA, MARYLAND 20014

July, 1976

FINAL
ENVIRONMENTAL IMPACT STATEMENT

REVISED MASTER PLAN
BETHESDA RESERVATION

NATIONAL INSTITUTES OF HEALTH
U.S. PUBLIC HEALTH SERVICE
Department Health, Education, Welfare
BETHESDA, MARYLAND

JULY, 1976

REVISED MASTER PLAN
BETHESDA RESERVATION
NATIONAL INSTITUTES OF HEALTH
PUBLIC HEALTH SERVICE, DHEW
BETHESDA, MARYLAND

() Draft (X) Final Environmental Impact Statement

Name of Action

(X) Administrative () Legislative Action

Additional Information

Additional information on the proposed action may be obtained from:

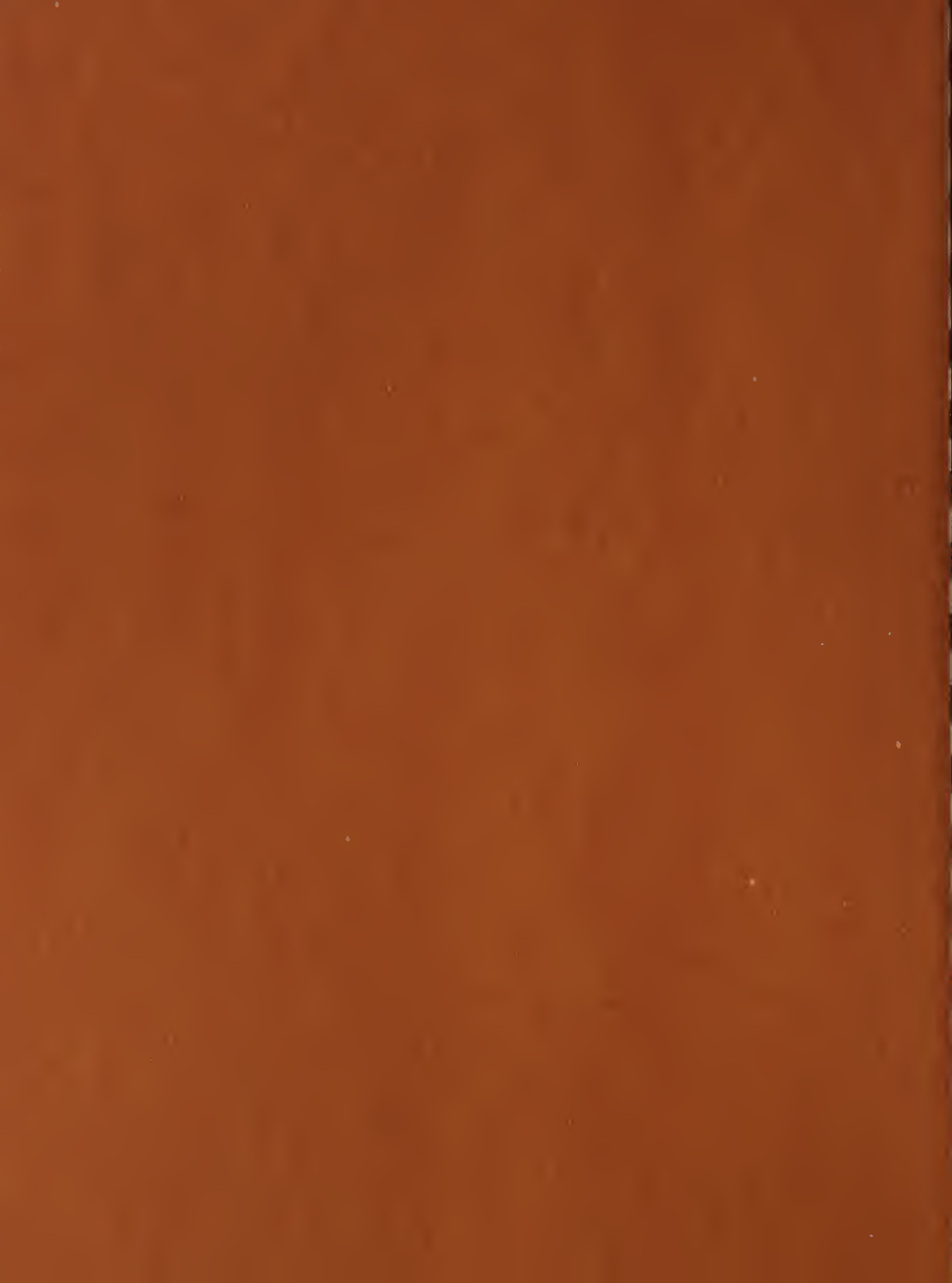
Mr. R. R. Holliday
Director
Division of Engineering Services
National Institutes of Health
9000 Rockville Pike
Bethesda, Maryland 20014

Telephone: 301-496-6186

Copies of the Environmental Analysis, Volumes I and II which are the supporting material for this FEIS can be obtained from the above individual.

Copies of the Final Environmental Impact Statement and the Environmental Analysis, Volumes I and II are on file at the Montgomery County Public Library--Bethesda, Davis, and Silver Spring Branches.

FOREWARD / SUMMARY



FOREWORD/SUMMARY

A. OBJECTIVE

The objective of the proposed action is to provide for the full expansion of biomedical programs and support activities at the NIH Bethesda Reservation.

This objective reflects the expected need for NIH to respond to an expanded demand for biomedical research, patient care, and support activities on the Bethesda Reservation. Program expansion requires construction of new facilities and an increase in the Reservation work force which will create change in the surrounding community and region. In order to respond to the expected demand in an orderly way, NIH developed the 1972 Revised Master Plan. This development plan is the focus of the Draft Environmental Impact Statement.

B. BACKGROUND

NIH has determined that the implementation of the plan will generate a significant environmental impact. This FEIS, therefore, is directed towards identifying and analyzing the potential cumulative environmental effects generated by the implementation of the full development plan. The plan represents a maximum expansion of the work force by 41 percent to 15,000 and the net addition of 32 percent to floor area (1.2 million square feet) for a total of about 5 million square feet.

The central premise of the Revised 1972 Master Plan is that research in basic aspects of human health and development will require the growth of federal responsibility for direct biomedical research and support of private research and development. For the Bethesda Reservation, several premises guided the development of the plan. These included development consistent with the constraints of the site and surrounding community, a maximum employment capacity of 15,000, reinforcement of current research and related programs, maintenance and enhancement of the "campus atmosphere," re-development of the internal circulation system and the transfer of surface parking to multi-level parking structures. The Revised 1972 plan has been approved by the National Capital Planning Commission (NCPC).

Program requirements of the various institutes were translated into specific physical development recommendations in order to rationally plan for ordered growth at the Bethesda Reservation. The plan envisioned full development over a period

of approximately twenty years. The key elements in the plan include:

- Ten buildings to be added as new projects including research related patient care, laboratories, an international conference center, a national center for biomedical communications and various support and service facilities.
- Removal of nine buildings including laboratories, animal buildings, and service facilities.
- Creation of a loop circulation system and a maximum of eight multi-level parking structures.
- Redevelopment and expansion of the landscaping on site.

C. EXISTING ENVIRONMENT

The NIH Bethesda Reservation is located within the Washington D. C. Metropolitan area, approximately 10 miles northwest of the District, in Montgomery County, Maryland. Montgomery County is a suburban county experiencing major residential and commercial growth. The vicinity around the site is primarily residential and institutional. Directly to the east of the site is the National Naval Medical Center and the Uniformed Services University of the Health Sciences (now under construction). The Bethesda Reservation of NIH is 306 acres with over thirty buildings, associated roads, parking, and support facilities. The "campus" environment is heavily landscaped and a wide buffer is maintained around the natural rolling topography of the site.

D. SUMMARY OF ENVIRONMENTAL EFFECTS

Two alternatives are evaluated: full implementation of the plan by 1990 and delayed implementation after 2000. "No action" is also considered.

Full Development By 1990

Full development of the plan by 1990 creates relatively minor changes in all environmental systems--natural, human, and technological. Potentially significant impacts arise from capacity limitations in a number of the technological systems.

Natural Systems.— The natural systems receive the least impact from the development at NIH. Open spaces will be increased with development, runoff will decrease, and no major new land uses are planned. With already planned

improvements in the boiler and incinerator facilities at NIH and implementation of improved automobile emission standards, air quality in all areas will improve at full development over current levels. The site is quiet and will remain quiet.

None of the short-term construction impacts will have a major impact. The increases in dust, erosion and noise during construction of individual projects will be minimal.

Population. - The increase in employment on the site centers on highly skilled professionals in biomedical research and support staff. The National Capital Planning Commission has approved this increased site population. Impacts on the community will be dispersed throughout the region if current living patterns of NIH employees continue into the future. The increased site population density does not of itself generate adverse environmental impacts. Its influence is felt in the technological support systems.

Water And Sanitary Waste Systems.- While the water requirements and sewage discharge at full development are within NIH's contracted amount with WSSC, growth in demand for service at NIH is a part of the overall regional growth which is taxing the capacity of these systems. Under normal conditions regional water supply is currently adequate, but supply will have to increase in the future to provide sufficient supply for projected regional growth. There are plans to increase water supply over the next five to twenty years. Solutions to the sewer line and treatment capacity problems have also been initiated but the timing and character of the plans are still uncertain. Until facilities are developed the current sewer moratorium in Montgomery County will remain in effect.

Solid Waste. - For the short run, several added projects can be handled within the current capacity of the NIH incinerator and the County land-fill. For the long-run, the magnitude of the impact is dependent on implementation of the countywide innovative plan to use solid waste as a fuel and to recover metals and other noncombustible components of refuse.

NIH generates a major portion of the medical/pathological wastes in the County. NIH is replacing its current obsolete incinerator with a new one especially designed to handle these wastes. Also, NIH is working closely with the County in an effort to develop a countywide incinerator for these special wastes.

Transportation. - Difficult long run capacity problems do arise in the transportation system. Again, even at full development, NIH will be adding very few more automobile trips than there are today due to increased car occupancy rates and mass transit use by NIH employees. The advent of the Metro rapid rail transit system, which will have a station on the NIH Reservation, will help to minimize the increase in traffic generated from other areas and from NIH.

Housing Resources.- The low availability of moderately priced housing in the site vicinity will require lower income employees to search longer distances from the site for housing. The major improvement in mass transit will increase the ability to find suitable housing and provide easy access to the site.

Full Development After 2000

The delay in the implementation of the development plan would generally lower the significance of possible impacts associated with the development. Basically it would allow more time for implementing solutions to capacity problems in the external technological system (such as in the water, sanitary sewer, housing, solid waste, and transportation systems).

No Action

No action would mean no expansion in the research and support programs on the Reservation and no removal of currently obsolete facilities. There would be no change in the demands made on most of the natural and cultural systems. With the advent of Metro, vehicle trips would drop considerably.

Conclusions

Implementation of the plan and any one of its elements depends on the priority of the country in biomedical research and development. The design of the plan incorporates this flexible response to national priorities and to local constraints. It is designed to foreclose future options on the level and character of development on the Reservation--by placing a limit on that development.

The proposed development at NIH fits all local and regional development plans which concentrate on focusing future growth in the Washington region: NIH is located in a development corridor, within the urban ring, on a Metro line. It reinforces the living-working relationships and is consistent with current area land uses.

The effects generated by full development are either minor or directly related to capacity constraints in technological support systems caused by the major growth in the Washington Metropolitan area. NIH development contributes a very small percentage to the total added demand on these systems. It is one part of the growth, however, and as such will contribute to the cumulative effect. Regional solutions to these problems have been proposed and implementation has started. To the extent that these actions are completed, the effect of the proposed NIH development would not likely produce significant impacts on natural environments or social/economic infrastructures.

AGENCIES RESPONDING TO DEIS

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
Environmental Protection Agency
National Capital Planning Commission

State Agencies

Maryland State Clearing House, State Department of Planning
Maryland Historical Trust

Regional Agencies

Washington, D. C. Clearinghouse, Council of Governments
Maryland-National Capital Park and Planning Commission

Montgomery County

County Executive

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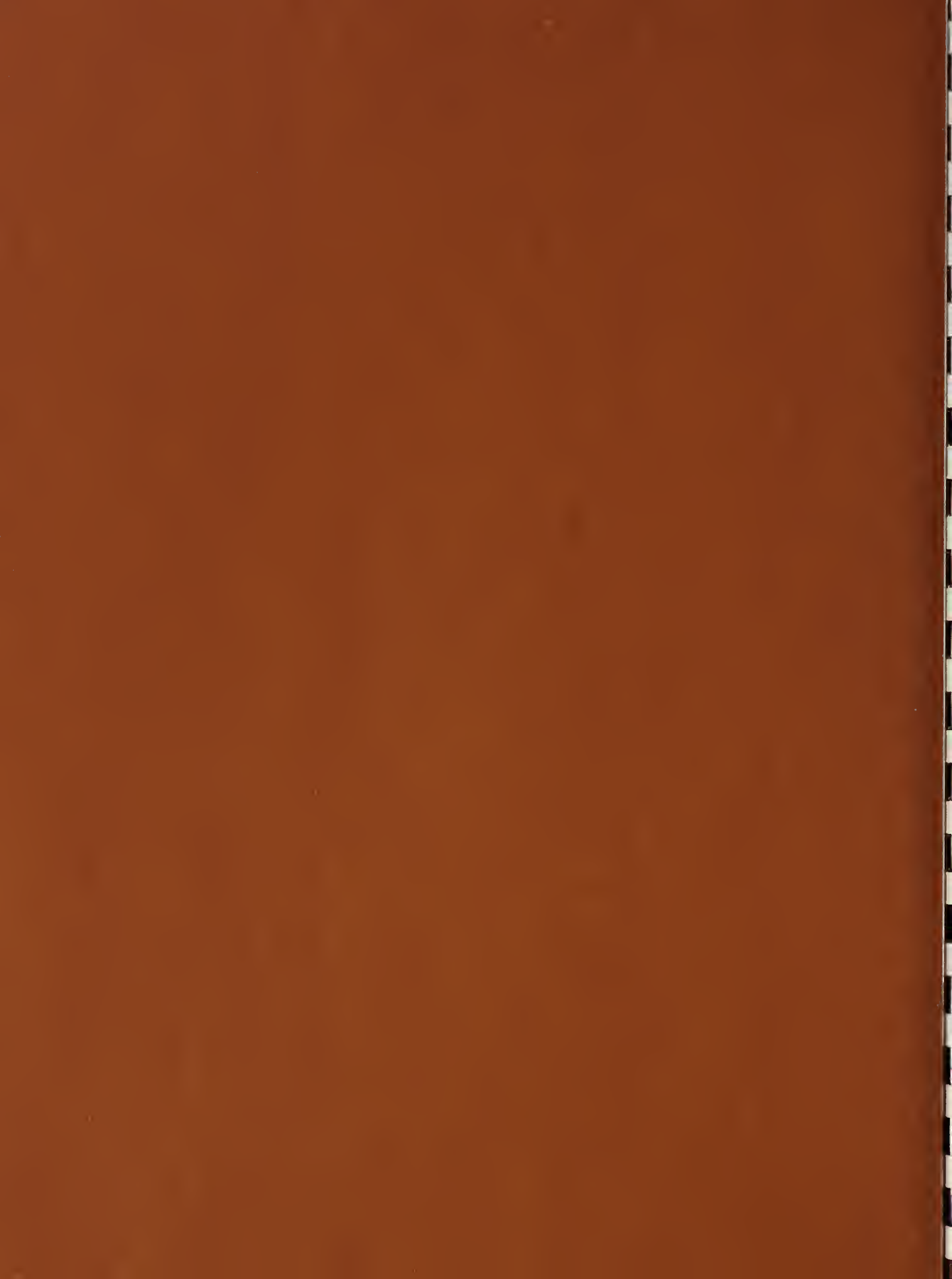
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I. OBJECTIVE

The objective of the proposed action is to provide for the full expansion of biomedical programs and support activities at the NIH Bethesda Reservation.

This objective reflects the expected need for NIH to respond to an expanded demand for biomedical research, patient care, and support activities. A portion of these additional program demands could be fulfilled at the Bethesda Reservation. The development plan for the Reservation is designed to respond to this demand in an orderly way that considers projected program needs as well as the constraints of the site and surrounding area.¹

NIH has determined that the implementation of the plan will generate a significant environmental impact. Program expansion requires construction of new facilities and an increase in the Reservation work force which will create change in the surrounding community and region.

Thus, in compliance with the National Environmental Policy Act of 1969 (NEPA), an Environmental Impact Statement (EIS) is required to evaluate potential environmental effects of the proposed action. In order to fully comply with Department of Health, Education, and Welfare (DHEW) procedures a comprehensive Environmental Analysis (EA) was completed on the proposed development for the Reservation.² The two volume EA provides a detailed description of the current

¹ Revised Master Plan, 1972, Marcou, O'Leary and Associates, Inc.

²Volume I of the Environmental Analysis presents the proposed development plan, a summary of the current situation and probable changes in the environment, and an evaluation of those changes using DHEW Initial Criteria. The analysis is presented for each individual project and for full development of the plan.

Volume II presents a detailed presentation of the current baseline situation and an impact analysis for each of the affected environmental systems. The DHEW criteria form the focus of both the baseline description and impact analysis.

situation on the site and in the surrounding community, outlines the changes generated by individual proposed projects and by the full development of the Revised 1972 Master Plan, and evaluates the impact of these changes on the environment from the standpoint of the DHEW environmental criteria.³

NIH officials have chosen to analyze and provide the public with an assessment of the effects of the overall physical expansion plan at the Bethesda Reservation. This EIS, therefore, is directed towards identifying and analyzing the potential cumulative environmental effects generated by the implementation of the full development plan which represents a maximum expansion of the work force by 41% to 15,000 and the net addition of 32% (1.2 million square feet of floor area) to a total of about 5 million square feet. (Each individual construction project will be subject to an environmental analysis before it is approved.)

An analysis of the specific research programs is not the subject of this EIS. The character and effects of research activities at NIH are currently being evaluated by NIH in a separate analysis as required by DHEW. This analysis evaluates the entire NIH programmatic effort including extramural (contract) research and intramural research at Bethesda and at all other NIH research facilities around the country.

³The Initial Criteria, set forth in the DHEW General Administration Manual, present over 100 criteria which define areas of possible environmental impact over the broad range of systems. The manual defines procedures required to implement the National Environmental Policy Act and related federal legislation. The criteria represent a list of effects which could lead to the occurrence of significant environmental impacts. (See: General Administration Manual, Chapter 30, Environmental Affairs, U.S. Department of Health, Education, and Welfare; October 17, 1973.)

II. BACKGROUND

II. BACKGROUND

THE HISTORY AND MISSION OF NIH

The History

The history of The National Institutes of Health (NIH) can be traced to the Marine Hospital Service, established in 1798 for the relief of sick and disabled seamen.

The first organized comprehensive national medical research effort by the Federal Government began in 1879 with the creation of the National Board of Health. In 1887 a bacteriological laboratory known as the Laboratory of Hygiene was established to study cholera and other infectious diseases. The research functions grew and in 1912 the Marine Hospital Service became the Public Health Service.

In 1930 the Laboratory of Hygiene was designated as the National Institute of Health with authorization to construct research facilities and create a system of research fellowships. NIH was given bureau status in the Public Health Service in 1943.

The current 306 acre Bethesda site began with the donation of the 45 acre estate of Mr. and Mrs. Luke Wilson in 1935. The first complex of buildings, centering around the present Administration Building (Building 1), was completed in 1938. The Wilsons later donated more of their land to NIH and in 1949, following the purchase of a former golf course on the southern portion of the site, the Reservation attained its current size.

The National Institutes of Health is now organized into five major subdivisions: National Cancer Institute, National Heart and Lung Institute, the National Library of Medicine, and the following research institutes and divisions.

National Institute of Arthritis,
Metabolism, and Digestive Diseases
National Institute of Neurological
Diseases and Stroke
National Institute of Dental
Research
National Eye Institute
National Institute of Allergy and
Infectious Diseases
National Institute on Aging
National Institute of Child Health
and Human Development

National Institute of General Medical
Sciences
National Institute of Environmental
Health Sciences
Fogarty International Center
Clinical Center
Division of Computer Research and
Technology
Division of Research Grants
Division of Research Resources
Division of Research Services

The total national investment in biomedical research and development has grown from \$87 million in 1947 to about \$3.5 billion today. Federal investment represents about two-thirds of this and NIH accounts for almost 40 percent of the total federal commitment to biomedical research and development.

The Mission

In its mission to improve the health of the American people, NIH conducts and supports biomedical research on the nature, detection, diagnosis, prevention, and treatment of a broad spectrum of diseases which afflict mankind. NIH programs are supported at a variety of locations through its extensive grant program in which over three-fourths of the public funds appropriated for NIH are awarded through the extramural research program to nonfederal institutions.

- Biomedical Research. In addition to conducting research projects in its own facilities, NIH, through its extramural programs, supports scientific investigation by non-NIH organizations. NIH research activities provide: 1) stimulation of scientific interest towards new areas of inquiry, 2) direction for penetrating inquiry into the shifting patterns of diseases and, 3) the means for exploiting advances in biomedical knowledge and physical and engineering sciences.
- Research Training. NIH administers programs which support the training and improvement of health research personnel.
- Biomedical Communications. Under its mandate to apply resources broadly to advance medical

and health related sciences, NIH collects, organizes, and makes available biomedical information and supports programs to strengthen existing and develop new medical library services. Its National Library of Medicine is the central resource for the existing national biomedical information system.

Biomedical research today requires a vast partnership between government and the private sector. NIH plays a critical role, bringing together the scientific and medical community to solve major health problems. Research and development programs at the institutes are designed to obtain new knowledge to combat the major disabling diseases prevalent in the United States such as cancer, heart disease, and neurological diseases. NIH programs study human development and the aging process and investigate the relationship of the environment to human health. NIH has made major contributions to biomedical research, and has supported the work of over 50 Nobel Prize winning scientists.

NIH is certain to provide significant contributions to the field of biomedical research in the future. Because the demand and character of future research is uncertain, NIH must remain flexible in its ability to respond to major new research programs as mandated by Congress.

DESCRIPTION OF THE PROPOSED ACTION

The Basis of the Plan

The central premise of the 1972 Revised Master Plan is that research in basic aspects of human health and development will require the growth of federal responsibility for direct biomedical research and support of private research and development. As the major federal agency in biomedical research and development, representing approximately 40 percent of the total federal commitment, NIH will continue to carry a major share of this added responsibility. For the Bethesda Reservation, several premises guide the development of the facilities in response to this projected increase in federal responsibility.

- The Bethesda Reservation will be developed to the greatest extent possible consistent with the ability of local services to support its activities.

- The space program is designed for a maximum employment capacity of 15,000 on the Reservation to conserve the type of environment necessary on the site, and to prevent undue impacts on the community and area services systems.
- The reinforcement and expansion of current biomedical research and research related patient care activities. Support activities and special functions will be designed to support this purpose.
- Office space will not be increased beyond that currently authorized; residential quarter areas will not be changed or expanded; and most animal production and holding activities will be removed.
- Current land use patterns of clustered functional relationships on the Reservation will be continued and reinforced.
- The growth and intensified use of land must still present a physical and natural "campus" environment. This will be conducive to creative professional activity in the advancement of basic research and promote patient well-being.
- The design and location of individual projects will be consistent with the site's physical and natural environment. Preservation and restoration of open spaces, important natural features, and the wide buffer zone around the entire site are essential for creating and maintaining the environment around NIH.
- Redevelopment of the circulation and parking system to provide better access to the site, improve internal movement, transfer parking from surface lots to multi-leveled parking structures (MLPs), and encourage mass transit use.
- A pedestrian system will be designed to encourage pedestrian rather than vehicular movement on-site by providing convenient routes between principal origins and destinations and making them attractive to use.
- Many of NIH activities currently housed in rental facilities throughout the Bethesda/Rockville area will be relocated on-site.

The Elements of The Plan

The Revised 1972 Plan, which has been approved by the National Capital Planning Commission (NCPC), was developed after evaluating the overall program requirements of the institutes (both existing and projected) on the Reservation.¹ These program requirements were translated into specific physical development recommendations in order to rationally plan for ordered growth at the Bethesda Reservation. The basic recommendations of the plan were bounded by the constraints imposed by programmatic activities and the physical limitations of the site and the surrounding area.²

Due to its proximity to other major federal institutions, the Reservation is a prime location for the expansion of biomedical research facilities. Directly east of NIH is the National Naval Medical Center (NNMC) and the site of the new Uniformed Services University of the Health Sciences (USUHS), which is presently under construction.³ At full development, this entire medical, research, patient care, and educational Federal complex, including over 22,000 researchers, teachers and support personnel, will be the largest in the world.

¹Before 1958, the Government Services Administration (GSA) periodically prepared and updated the Master Site Plan for the Bethesda Reservation. In 1961 the first official Master Plan for the Reservation was approved by National Capital Planning Commission (NCPC). The plan was updated and approved by NCPC in 1966. By 1970, the continued rapid growth of NIH made a further restudy necessary. The 1972 Revised Master Plan is this reevaluation.

²Environmental Analysis, Volume I; contains a detailed presentation of the proposed development plan.

³A detailed Environment Impact Statement for USUHS was filed by the Navy in January 1975. The analysis and conclusions developed in that study have been incorporated in this environmental study to insure that the character of change generated by institutional development in the area is adequately considered.

The timing of the 1972 Master Plan envisioned a full development of the plan over approximately twenty years with a limit of 15,000 employees. The development of the full plan and any specific element depends on the funds available within the national budget, Congressional priorities, and public health requirements calling for new research directions. Thus the timing and ordering of the development within the plan are flexible.

The 1972 Revised Master Plan proposes ten specific projects and a maximum of eight multi-level parking structures (MLPs). As a part of the overall plan, nine existing buildings and almost all areas of existing surface parking will be removed (Map 1 and Table 1). Major changes in site development are outlined below.

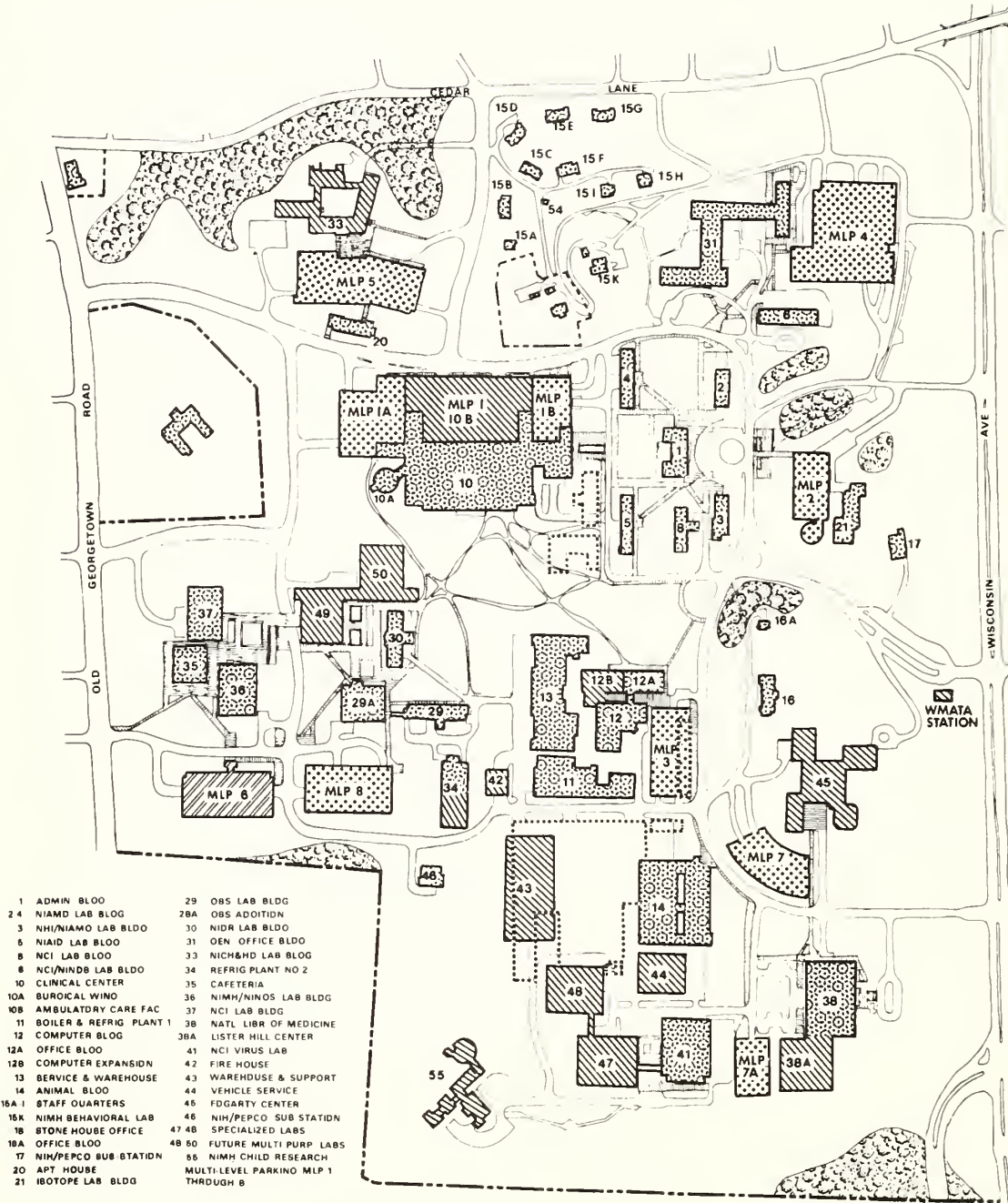
- Ten buildings to be added as new projects include the Ambulatory Care Research Facility and several laboratories including the Child Health and Human Development Lab, Child Research Behavioral Lab, two general purpose laboratories, and two special purpose laboratories. Also to be added are two special purpose facilities, the Fogarty International Center and an addition to the National Library of Medicine, the Lister Hill National Center for Biomedical Communications. A combined services complex, to include a warehouse, vehicle service, and firehouse buildings, along with additions to Buildings 12, 12A (computer/office use) and Building 34A (refrigeration plant), are included as proposed projects. A Metro (rapid rail) station is also programmed for development on the NIH campus.⁴
- Nine buildings will be removed including two laboratories, animal buildings, service building, chemical storage and disposal structures, a transformer building, and a greenhouse laboratory.

⁴The metro station is on the Bethesda Reservation and is included in the Master plan. But it is not part of this proposed action because the lead agency for the WMATA work is the Department of Transportation. A separate environmental assessment was done for the entire Rockville line by WMATA.

- The creation of a loop circulation system allowing more efficient vehicular movement on the campus and discouraging the use of NIH roadways by through-traffic. A maximum of eight MLPs will be added, and almost all existing surface parking will be eliminated.
- Redevelopment and expansion of the landscaping on the site with a peripheral buffer of 150 to 250 feet around the entire site.

These elements of the plan are the proposals for long-range development of the Reservation. The proposals of the plan are subject to change in the future as the need occurs for specific projects. As a result, specific project characteristics, such as the exact size and configuration of each project or the size and number of MLPs, will be subject to review prior to implementation.

MAP I PROPOSED PROJECTS, LOCATION



- 1 ADMIN BLDG
- 2 4 NIAMD LAB BLDG
- 3 NIH/NIAMMO LAB BLDG
- 5 NIAMD LAB BLDG
- 8 NCI LAB BLDG
- 8 NCI/NINDB LAB BLDG
- 10 CLINICAL CENTER
- 10A BUROICAL WING
- 10B AMBULATORY CARE FAC
- 11 BOILER & REFRIG PLANT 1
- 12 COMPUTER BLDG
- 12A OFFICE BLDG
- 12B COMPUTER EXPANSION
- 13 SERVICE & WAREHOUSE
- 14 ANIMAL BLDG
- 16A 1 STAFF QUARTERS
- 16K NIMH BEHAVIORAL LAB
- 18 STONEHOUSE OFFICE
- 18A OFFICE BLDG
- 17 NIH/PEPCO BUS STATION
- 20 APT HOUSE
- 21 IBOPTOPE LAB BLDG
- 29 OBS LAB BLDG
- 29A OBS ADDITION
- 30 NIDR LAB BLDG
- 31 GEN OFFICE BLDG
- 33 RICHMOND LAB BLDG
- 34 REFRIG PLANT NO 2
- 35 CAFETERIA
- 36 NIMH/NINOS LAB BLDG
- 37 NCI LAB BLDG
- 38 NATL LIBR OF MEDICINE
- 38A LISTER HILL CENTER
- 41 NCI VIRUS LAB
- 42 FIRE HOUSE
- 43 WAREHOUSE & SUPPORT
- 44 VEHICLE SERVICE
- 45 FDGARTY CENTER
- 46 NIH/PEPCO SUB STATION
- 47 48 SPECIALIZED LABS
- 48 50 FUTURE MULTI PURP LABS
- 55 NIMH CHILD RESEARCH
- MULTI-LEVEL PARKING MLP 1 THROUGH 8



- BLDG. REMOVED
- EXISTING BLDG.
- PROPOSED BLDG.
- EXISTING PARKING
- PROPOSED PARKING
- Major Wooded Areas

TABLE 1 - GENERAL PROJECT CHARACTERISTICS OF THE NIH DEVELOPMENT PLAN

| Number | Name | Function | Empl'm't | Design Character | Ground | |
|------------|---|-------------------------------------|----------|--|---------------------|---------------|
| | | | | | Size-sq. (000) ft. | Stories |
| | | | | | Cover-sq. (000) ft. | Abv/Blw Grade |
| 10B | Ambulatory Care Research Facility | Out-Patient Research | 1000a | Similar to Bldg. 10 | 380 | 6/1 |
| 33 | Nat. Inst. of Child Health and Human Development | Laboratory | 450 | Community Center character, cluster of 4 bldgs. around court | 190 | 4/1 |
| 49-50 | General Purpose Lab. | Laboratory | 1400 | Similar to Bldgs. 36, 37 | 480 | 5-6/d |
| 47-48 | Special Purpose Lab. | Laboratory | 300 | Similar to Bldg. 41 | 150 | 1-2/d |
| 55 | Nat. Inst. of Mental Health Child Res. | Laboratory (behavioral) | 50 | Residential char. 4 connected bldg. | 32 | 1-2/1 |
| 38A | Lister Hill Ctr. for Bio-medical Comm. | Intern'l Informat'n & Communication | 430 | Tower structure with podium-type base | 200 | 10/3 |
| 45 | Fogarty Int'l Ctr. | Int'l conf. meetings | 170b | Spread memorial struct. with aud. | 205 | 2-3/1 |
| 12B | Add. to Bldg. 12, 12A, office/com. | General Adm. | 100 | Similar to exist. Bldgs. 12, 12A | 38 | 4/1 |
| 42, 43, 44 | Combined Services Complex (Firehouse, Whse. Greenhouse) | General Services | 180 | d | 140 | 1-3/d |
| 34A | Addition to Bldg. 34, Ref. Plant | General Sv. Cooling Twrs. | - | Similar to exist. Bldg. 34 | 15 | 3/na |
| TOTAL | | | | | 1,830 | 636 |

Notes: a800 outpatients/visitors per day Source: Revised Master Plan, 1972, and
 b500 visitors/day NIH Almanac, 1974.
 cdelivery access included
 dnot determined

III. EXISTING ENVIRONMENTS

III. EXISTING ENVIRONMENTAL CONDITIONS

THE REGIONAL SETTING

The NIH Bethesda Reservation is located within the Washington, D.C. Region, in Montgomery County, Maryland (Map 2). The Reservation is in the highly developed suburban area of Bethesda, about 10 miles northwest of the center of the District of Columbia. Situated in The Rockville Pike/Wisconsin Avenue development corridor, NIH is just north of the central business district of Bethesda and south of Interstate I-495, the Capital Beltway.

Montgomery County is a suburban Washington County experiencing many of the problems associated with rapid growth and urbanization. These problems center primarily around fiscal and physical planning. Residential, commercial and industrial development is rapidly occurring, placing a burden on local and state government to provide the necessary services. Currently, there is a sewer moratorium in effect because development was taking place faster than utility services could be expanded.

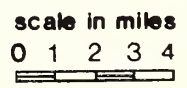
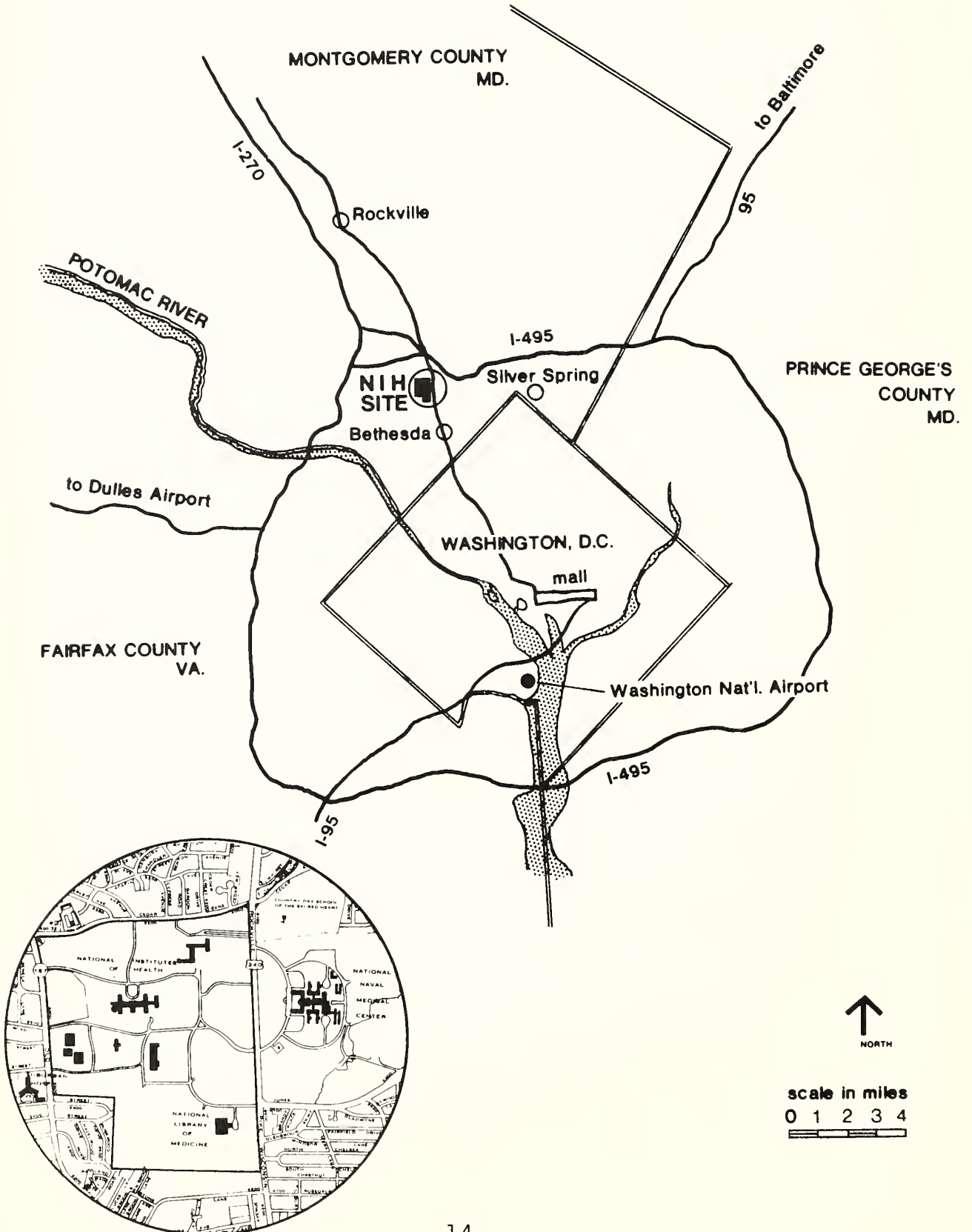
Nevertheless, significant planning and governmental action is taking place. New development is being encouraged to locate close to existing or proposed transportation corridors. Thus, the regional "wedges and corridors plan", which focuses development in growth corridors, is being implemented.¹ Secondly, the new regional rail-rapid transit system is currently under construction. Metro has the potential for alleviating peak hour congestion problems affecting the entire Washington regions, providing a further focusing of development.

THE SURROUNDING VICINITY

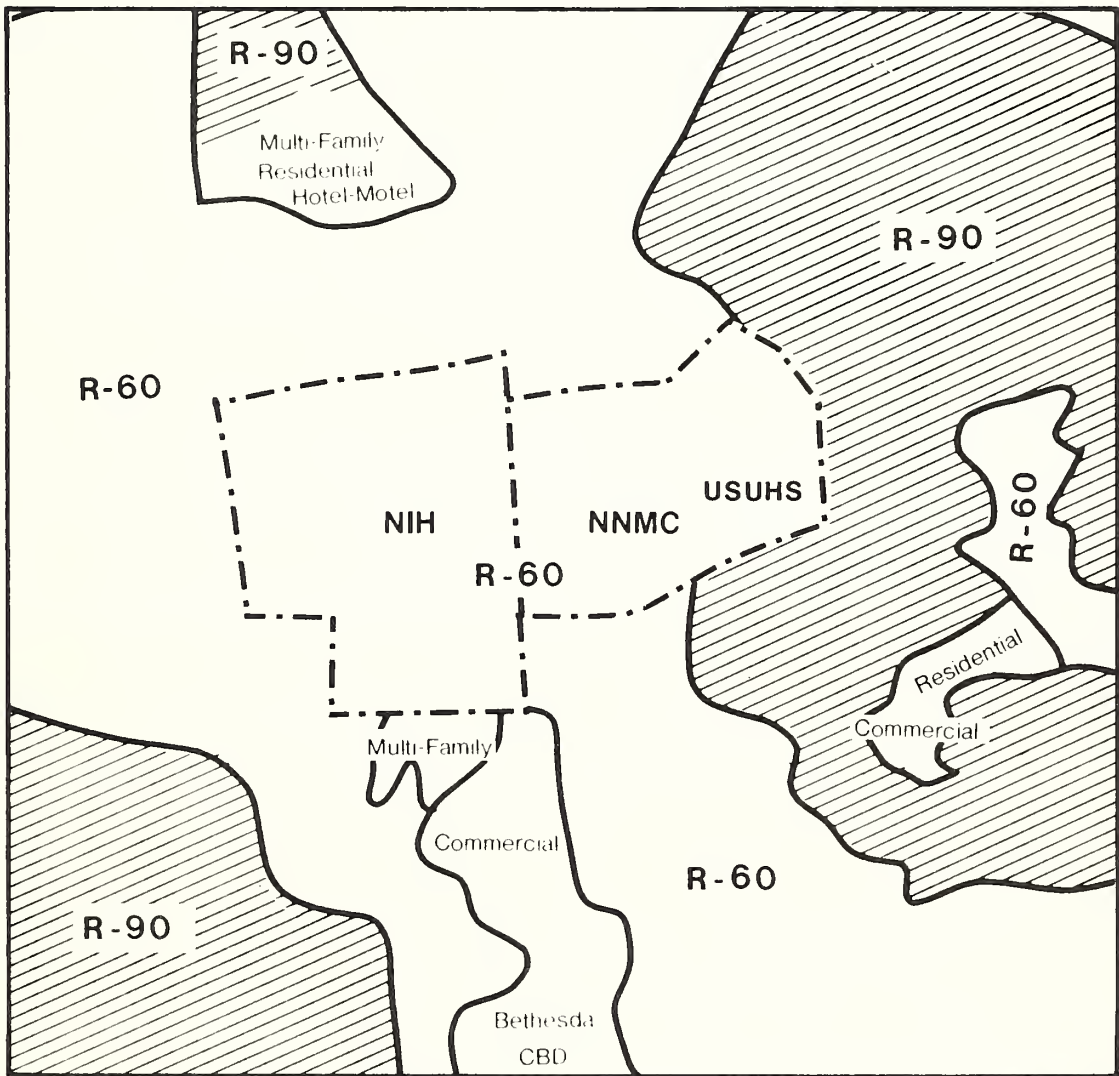
The NIH Bethesda Reservation is located in an area of major federal institutional use, surrounded by residential neighborhoods. As shown in Map 3, current zoning reflects

¹Year 2000 Policies Plan - The Nation's Capitol, Regional Planning Council of NCP, 1961; and On Wedges & Corridors, a General Plan, MNCPPC, 1964.

MAP 2 REGIONAL LOCATION OF NIH



MAP 3 EXISTING ZONING GENERALIZED



R-60 & R-90
Low density single
family residential



source: Zoning Maps, MNCPPC, July 1974

existing land-use in the area. The major land-use characteristics of the local area are listed below.

- The perimeter area of the site contains established neighborhoods of single family housing and additional institutional uses.
- South of the NIH site is the northern boundary of the Bethesda Central Business District (CBD), with restaurant and motel uses predominating in the northern portions, along with the Battery Lane area of low-rise medium density apartments, located west of Wisconsin Avenue.
- In close proximity to the site is part of Rock Creek Regional Park, a regional network of 4,700 open space acres; 3,100 acres of the park are located in Montgomery County.

Both the NIH and NNMC/USUHS sites are located in the R-60 residential zone (four to seven dwelling units per acre) which permits, by special exception, a variety of institutional-related uses such as hospitals, private educational institutions, and philanthropic institutions.

The area around the site is almost completely developed with residential, institutional, and commercial land uses:

- North - residential, some institutional.
- East - institutional.
- South - residential and commercial.
- West - residential, some institutional.

THE BETHESDA RESERVATION

The National Institutes of Health in Bethesda is the federal government's principal intramural research and clinical study location. It is the management center for extramural research programs and international activities. About 10,500 Public Health Service employees are located on the Bethesda Reservation.

The Bethesda Reservation is a "campus" environment with over thirty major buildings and associated roads, parking, and support facilities. While there are only a few small areas of canopied woods and two small streams, the site is heavily landscaped with trees, shrubbery and large open grassed areas around the building clusters. A wide buffer minimizes

the current impact on the surrounding community. The natural rolling topography of the site has been retained and many undeveloped areas of gentle hills create an open campus atmosphere conducive to the creative professional research taking place on the Reservation (Map 4).

About 96 acres of the site are currently committed to full development in buildings, roads, and parking. There are almost four million square feet of usable floor space. Functionally, the distribution of use is approximately 25 percent in each of the following areas: administrative, laboratories and patient care, general services, and public areas. Almost three-quarters of the buildings have uses that are predominantly research or patient care related. Special functions such as the Fogarty International Center and the National Library of Medicine are increasingly important. Central services are focused around Buildings 11 and 13.

The circulation system now consists primarily of two main roads running through the site from east to west and a number of short connecting roads. While the system can handle current traffic, it is not well organized and movement within the site is difficult. Localized parking problems also exist. Pedestrian movement is hampered by the integration of the systems.

THE EXISTING ENVIRONMENT

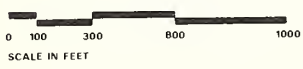
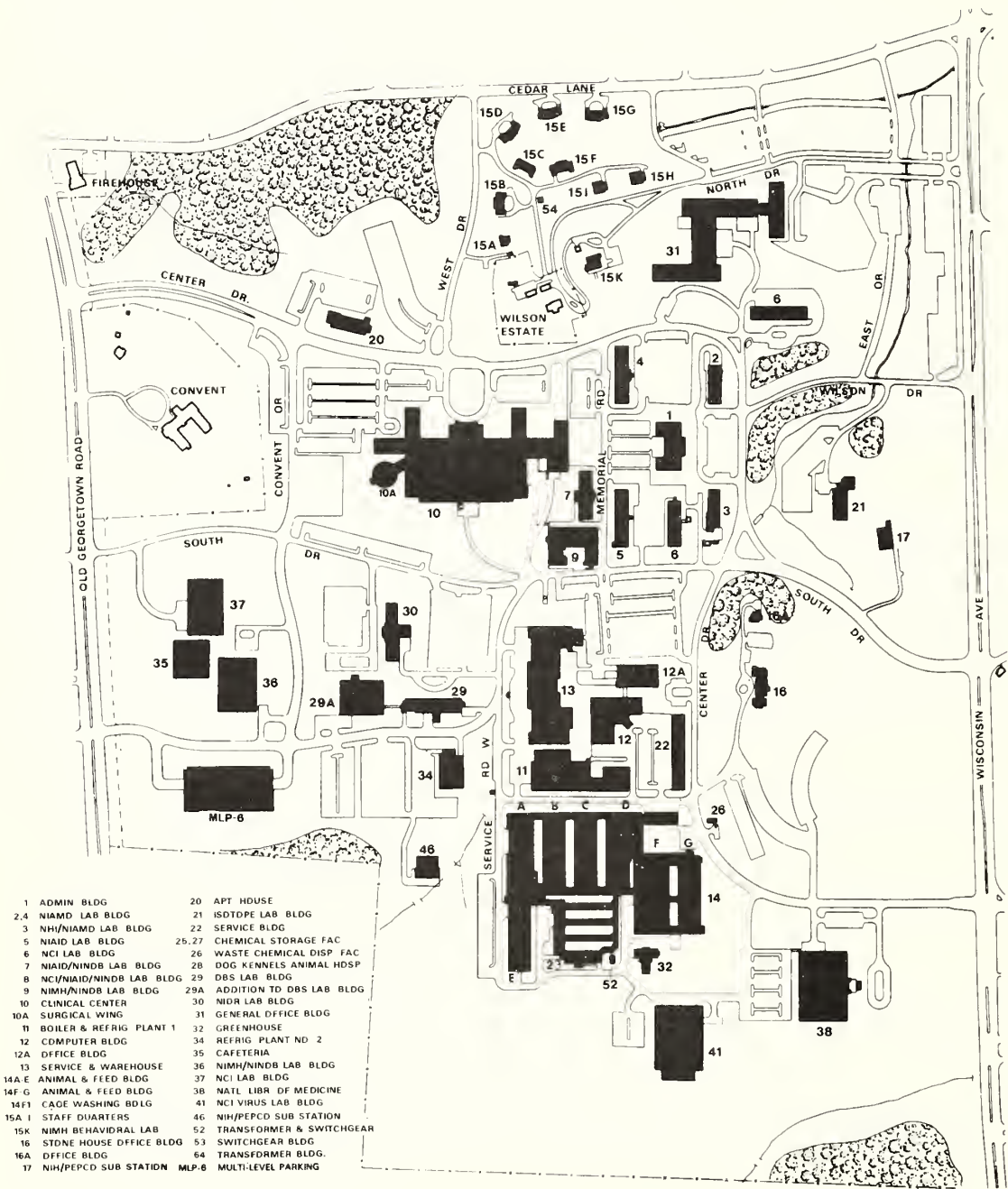
Natural Systems


Land and Waters. - NIH is located on relatively impervious, unfractured rocks on deeply weathered soils.² The soils found on the Reservation are well drained soils, moderately eroded where remnants of the original profile exist. The soils have had extensive modification due to construction activities over the years and the building of the original golf course on the southern part of the site.

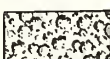
Surface waters drain into the two small streams on the Reservation and into Rock Creek. No water impoundments

²Environmental Analysis, Vol. II contains a detailed presentation of the existing environmental conditions.

MAP 4 CURRENT DEVELOPMENT AT NIH



 Existing Buildings

 Major Wooded Areas

occur on the site. The main NIH stream which traverses the Reservation is largely modified with a major portion enclosed in a concrete tunnel and most of the rest stabilized with rip-rap and woody species to prevent erosion. The gradient of the NIH stream defines a narrow floodplain, while Stream "G" crossing the southern corner of the site has a lower gradient and thus a wider floodplain. The existing storm sewer system is adequate to accommodate the 100 year storm (a storm with an intensity likely to happen only once every 100 years).

Water quality in the two streams reflects their urban setting. One stream running through the southeast corner of the site exceeds Maryland Class I water quality standards for fecal coliforms. Indications are that this contamination is from animal wastes due to the use of the area as a "dog run" by area residents and not generated by NIH. Water quality in this stream gradually improves downstream as its gradient increases and an invertebrate fauna develops. The main branch of the NIH stream, which flows through the site from southwest to northeast, showed higher levels of conductivity (a measure of dissolved solids), phosphate, nitrate, and nitrite. No Maryland Class I water quality standards are exceeded on this stream but no invertebrate fauna were collected during sampling. The absence of benthos life forms in the NIH stream indicates that an intermittent toxicity problem currently does exist. An effluent limitation under the National Pollution Discharge Elimination System (NPDES) is exceeded by the waters of this stream. (NIH is currently conducting studies to evaluate cooling tower discharge and recommend means to recycle this discharge water.)

Air Quality. - Point sources of air pollution in the vicinity of the site are the numerous stacks for boilers and incinerators in the area--NIH, the National Naval Medical Center (NNMC), Suburban Hospital, and a number of large commercial buildings to the south of the site in the Bethesda business district. Traffic represents the major source of air pollutants in the surrounding area and is a major pollution problem. Hydrocarbons and photochemical oxidants generally exceed both national and state standards throughout the region. Sulfur dioxide sometimes exceeds the 24 hour maximum limit of the stringent "more adverse" Maryland standards but does not exceed national standards in the vicinity of the site. Both the NIH and the Navy incinerator facilities exceed emission standards for particulates and are operating under agreements with the applicable federal and state agencies. Both NIH and NNMC are in the process of replacing the current obsolete incinerators with medical/pathological waste (MPW) incinerators

which meet all applicable federal and state emission requirements. Six pollutants were studied:³

- Carbon Monoxide samples at AIRMON 6 satisfied ambient air quality standards. Calculations of air quality were made for 12 points around the site and indicate that no concentrations attain the 35 ppm one-hour standards (National and Maryland) and eight-hour concentrations can exceed the 9 ppm only along Rockville Pike where a maximum 9.4 ppm is possible.⁴
- Oxides of nitrogen are acceptable throughout the Washington Metropolitan Area. AIRMON 6 reported 73 micrograms per cubic meter averages in 1973 within the 100 microgram per cubic meter standard.
- Hydrocarbons are generally far in excess of the 160 micrograms per cubic meter (monthly maximum 3-hour average) national and state standards throughout the District of Columbia Metropolitan Area. AIRMON 6 reported 92 days' violation in 1973. Concentrations were worse at AIRMON 5 two miles north-east of NIH where standards were violated on 115 days.
- Photochemical oxidants, formed by the combination of oxides of nitrogen and hydrocarbons, are generally far in excess of the 160 micrograms per cubic meter monthly maximum 1-hour national standard. AIRMON 6 reported 305 hours violation in 1973. The high hydrocarbon and oxidant levels on the NIH reservation are no doubt generated by heavy traffic off the Reservation. Carried to the Reservation by wind, pollutants build up in the valley which contains the AIRMON 6 unit.
- Sulfur dioxide conditions are generally acceptable in the District of Columbia and Montgomery County. The 14 Maryland stations satisfied all national standards through 1973 and 1974. AIRMON 6 did

³An air monitoring station (AIRMON 6) is on the NIH site.

⁴See footnote 1 on page 38 for a complete reference to the air quality model used for this analysis.

exceed the 131 micrograms per cubic meter 24-hour maximum, "more adverse" Maryland Standard on three days in 1973-74.

- Suspended particulate matter concentrations in the NIH area were within all national and Maryland standards (four stations within four miles of NIH).

The Level of Sound. - The existing noise levels on the NIH Reservation were determined by field measurement. The campus can be characterized as quiet. In all cases the noise levels permit enjoyable use of the outdoor areas for practically any type of business or recreational activity. Noises produced by on- and off-site traffic and by building operations are well within all applicable standards.

Populations

Plant and Animal Populations. - Plant populations at NIH are largely remnants of the forest which formerly covered this area or are landscaped areas replacing a golf course. Although the small woodland areas of the NIH site (about 3 acres) lack natural understory vegetation, the canopy trees have maturity and excellent form.

Aquatic vascular plants are absent along the stream courses because of their incompatibility with current landscape planning.

Wild animals are typical of species found in urban environments while no vertebrates are known to exist in the stream reaches on NIH property.

There are no plant or animal species identified on the federal endangered species list on the site or in the vicinity of the site.

Human Populations. - Approximately 10,500 people are employed on-site with about 500 employees working part-time. The overall employment level and the operational character of employees have remained relatively stable over the past ten years.

In 1974, there was a total of 72,749 outpatient visits, an average of about 250 outpatient visits daily. Specific data concerning visitor trips is not available. It is estimated that roughly 25 visitors arrive on-site during the typical rush-hour period.

Montgomery County, with an annual growth rate of 4 percent, is one of the fastest growing areas in the country. The Bethesda-Chevy Chase area is almost fully developed and thus has a much slower growth rate (about 1% annually). Approximately 16 percent of the county's total population resides in the Bethesda-Chevy Chase planning district.

Technological Systems

Energy Systems. - Current capacity of the boiler plant facilities at NIH are more than adequate for current demand. The chilled water system is presently operating near full capacity. One additional 3,000 ton unit is being added. Electrical service is provided by the Potomac Electric Power Company (PEPCO). Current peak demand is approximately 34,500 kilowatts. Capacity of the two substations on the NIH Reservation which provide power to NIH, NNMC, and some nearby residential areas is currently 83 MVA.⁵ NIH uses about 46 percent (approximately 38 MVA) of the present capacity of these stations. The two substations have an expansion capacity of 57 MVA for a total future potential of 140 MVA. Total fuel consumption for the boilers and some of the cooling generators is about 9 million gallons of No. 6 fuel oil annually.

NIH generates demands for energy both from on-site consumption and from its employees' use of energy for heating, cooling, lighting, cooking at home, and vehicle trips to and from work. To estimate the total energy demand at NIH, all major consumption areas for site facilities and employee demands were transformed into common BTUs. Currently, the site consumptions in major areas is almost 3 trillion BTUs annually, and employee households consume about 1.8 trillion BTUs a year. Total use represents an equivalent consumption of almost 40 million gallons of gasoline annually. Vehicle trips represent about 8 percent of the total energy consumption of site facilities and employee households.

Water and Sewer Systems. - The Bethesda Reservation average monthly water consumption is about 41 million gallons. This represents 48 percent of the maximum contracted supply committed to NIH by the Washington Suburban Sanitary Commission (WSSC). The current on-site distribution system and supply

⁵Megavolt Ampere (MVA) is a measure of electrical generating capacity. One MVA is equivalent to approximately 1.11 Kilowatts.

mains to the site are more than adequate to service the Reservation. Regionally, the Washington area is facing a continued problem of adequate water supply from the Potomac. Long-range programs are being implemented to solve this problem and include construction of a number of dams to augment the flow of the river. Relief is expected by the mid-1980s.

Currently, NIH discharges about 34 million gallons monthly into the sanitary sewers which represents 82 percent of the total water consumption. NIH is authorized to discharge a total of approximately 4,700 gallons per minute (gpm) into the sewers. The best estimate of current peak discharge is 3,000 gpm. The capacity of the on-site sewers and vicinity lines is adequate to service the site and residential areas which discharge into the same lines.

In 1973, a strict sewer hook-up moratorium was initiated in Montgomery County which strengthened the State of Maryland moratorium imposed in 1970. Both interceptor sewer line capacity and treatment capacity problems required the moratorium. A number of proposals have been initiated to alleviate both problems. A new AWT facility has been planned for a site at Dickerson, Maryland, by the Washington Sanitary Sewer Commission (WSSC) in conjunction with the State of Maryland and Montgomery County. This facility would solve both the line and capacity problems in the vicinity of the site because a major part of the flows upstream of the site would be pumped over to the Dickerson plant, thus alleviating the line capacity problems in the Rock Creek Interceptor downstream from NIH in the District of Columbia.⁶ The capacity projected at the Blue Plains treatment facility will then be adequate for projected growth in the area.

At this point, however, it is uncertain if Dickerson will be chosen as the site for a new facility.⁷ Until additional sewage treatment capacity is provided for the regional system,

⁶WSSC has signed an agreement with the District of Columbia not to increase the flow in the Rock Creek Interceptor.

⁷On April 8, 1976, the Environmental Protection Agency made public a "tentative" preliminary document which concluded against constructing an AWT facility at Dickerson. The EPA has suggested expanding existing sewage treatment facilities on Piscataway Bay in southern Prince Georges County.

there will be severe limitations on the system's ability to absorb increased flows. The existing moratorium cannot be lifted until new facilities are built or existing plants are enlarged.

The current storm sewer system is adequate for the current site and is capable of transporting the runoff for at least a 100 year storm of one-hour duration. The storm water system discharges into the two streams that traverse the site and flow into Rock Creek.

Solid Waste Systems. - NIH generates about 35 tons per day of a broad range of common refuse and medical pathological wastes. This represents about 3% of the general refuse and 40% of the potentially infectious wastes generated in Montgomery County. About 26 tons of common refuse, 4 tons of noncombustible and bulk items, and 4 tons of medical/pathological wastes are generated daily on the Reservation.

About 60% of all wastes are still disposed of in the NIH incinerator. All medical/pathological wastes and more than 1/2 of the common refuse is incinerated on-site. The remainder is transported to the county incinerator/landfill operation by NIH equipment or private contractor. A paper recycling program is taking place at NIH and over 100 tons were collected for recycling in 1973. NIH has designed detailed identification and handling procedures for all infectious or potentially infectious wastes. Pathological wastes and other special medical wastes are autoclaved, placed in plastic bags, sealed, and tagged. At the incinerator these wastes are separated and fed directly into the incinerator and are not mixed with general wastes at any time.

NIH is installing a new medical/pathological waste (MPW) incinerator which will comply with all state and federal air quality regulations. The current incinerator will then be closed. The new incinerator will be capable of handling all NIH-generated medical/pathological wastes. NIH is also working closely with the county in an effort to develop a county-

wide MPW incinerator.⁸ Preliminary planning is complete and the incinerator is scheduled to be constructed in 1977. When the County incinerator is installed, the NIH incinerator will become a standby unit.

Montgomery County is very short of landfill areas and they have closed their general refuse incinerator. They are developing a central processing facility to process wastes for use as a fuel by the area electrical utility. A program for metal recovery will also be developed.

Housing Resources. - Approximately 57 percent of NIH personnel reside in Montgomery County with 11 percent living in the immediate area of the site. Montgomery County is experiencing a very tight housing market. Low and moderate income housing is in particularly short supply. The short supply of housing combined with the county's rapid growth rate has escalated housing prices and rent levels. The average single family home in Montgomery County sold for \$55,000 in 1974-75. The vacancy rate in county rental units is about 3.5 percent, but for lower cost rental units the vacancy rate is less than 1 percent. Montgomery County is attempting to stimulate the building of moderately priced housing through special zoning regulations, which requires developers to include a certain proportion of moderately priced units in their developments.

A limited amount of housing is provided on the NIH Reservation. Currently, 156 persons reside on-site in 94 rental units.

Maintenance Systems. - Maintenance systems include police, fire, and health care services in addition to education and recreation facilities. While most of these services are provided both on the NIH reservation and by the local community, they serve different needs and clientele.

On-site services are aimed at specific employee or security demands for the Bethesda Reservation. For example, education services center around training and research programs, while the fire-rescue service performs special duties, such as chemical pick-up and disposal, as well as fire protection.

Services provided by the local community center around residential demands. There are numerous primary and secondary schools in the area, in addition to an extensive county park system. Police and fire protection appear to be more than

⁸The transportation of MPW is closely regulated. NIH will comply with all requirements of C.F.R. Title 42, Part 72.25.

adequate with one of the county's four police stations located in the Bethesda CBD and two fire stations in proximity to the site. In general, the Bethesda-Chevy Chase area is well served by public facilities.

The Transportation System. - With almost 11,000 employees, NIH accounts for about 28 percent of peak hour traffic flowing through the three major intersections surrounding the site (Map 5). Traffic counts at the 11 NIH entry points show total entry volumes to be 4,300 during the a.m. peak hour.

The surrounding roadway system is currently heavily congested during morning and evening peak periods. Intersection congestion is especially great at the three key intersections around the site.

A total of 6,950 parking spaces are provided on the NIH Reservation, with 6,600 reserved for employee parking. Nearly all parking is used during peak periods. Approximately 93 percent of NIH employees arrive to work by car. Limited bus service is provided to the NIH Reservation with approximately 4 percent of the employees using public transit.

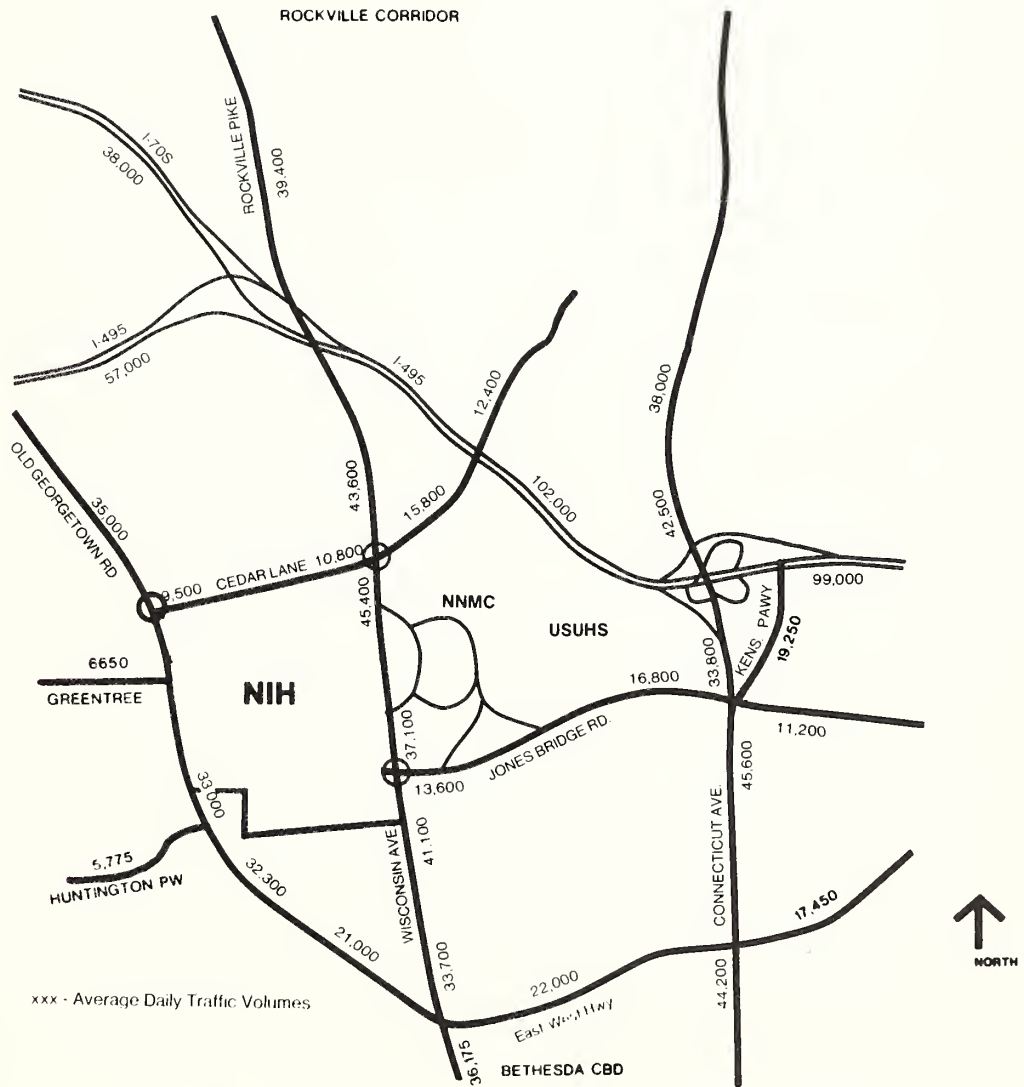
The new rapid rail system under construction in the Washington region will have a major impact on NIH because one of the major lines is being developed adjacent to the site on Rockville Pike/Wisconsin Avenue. One of the stations is being constructed at NIH. An expanded feeder bus system is also planned to link with the rail system.

Communication Systems. - Telephone service is provided in Montgomery County by the C & P Telephone Company. NIH, with 6,000 lines, accounts for about 3.1 percent of the 193,000 lines in Montgomery County and 19.6 percent of the total main station in the Bethesda Wire Center.

Other Communication facilities on-site are teletype and computer data terminals and various short wave frequencies for fire, security, disaster control, and civil defense. A VHF transmitter operates at the National Library of Medicine. No interference has been experienced.

Business and Economic System. - The employment base for both the Washington SMSA and Montgomery County centers around the Federal Government and service support industries. Employment grew by 55 percent in the SMSA and over 120 percent in the county between 1960 and 1970.

MAP 5 MAJOR ROAD ADT/AREA TRAFFIC GENERATORS



source: 1973 Montgomery County traffic volume map.

Following one of the main goals of the Montgomery County General Plan, there is an increase in living-working relationships within the county and there is less dependence on the federal employment base.

The average income of full-time employees in 1974 was \$15,700. About 30 percent of full-time employees earned less than \$10,000 and 15 percent earned more than \$25,000. The estimated median family income in Montgomery County was \$23,100 in 1973. Moreover, residents in the Bethesda area have incomes significantly above the county's median. Resident employment in the county is concentrated in generally highly skilled occupation groups.

NIH represents 25 percent of all federal employment in the county and 6 percent of the total employment. Directly, NIH spends about \$184 million annually with \$150 million in wages. When indirect multiplier effects are considered, the estimated total impact of NIH is over \$250 million annually. Because of the concentration of living locations in Montgomery County about \$150 million annually of this total impact accrues to the county economic system.

The Bethesda CBD, directly south of the site, will experience future growth in office space, residential uses, and retailing. Since NIH is in one of the major defined development corridors of the region, further extensive development north of the site along Rockville Pike and I-270 is expected. This development will be further spurred with the advent of Metro, focusing much of the growth around station locations. Over \$1 billion in public and private construction is projected by 1990 within 5 miles of the Reservation.

Government Financial System. - Montgomery County has a strong and diverse tax base. Because of its proximity to the nation's capital, many government related and research and development industries are located in the county. Nevertheless, government finance is a problem. County expenditures are increasing more rapidly than the tax base, with the cost of education alone increasing by more than 170 percent since 1966.

NIH, as a federal institution, is tax exempt. NIH employees residing in Montgomery County (about 60 percent), however, generate approximately 6 percent of local taxes when direct and indirect sources are considered and NIH contributes to local revenues through the "federally impacted areas" grant program.

Historic Resources

There is one locally inventoried historic site in the vicinity of NIH. The Temple Hill Baptist Church and Cemetery is located north of the site to the west of Rockville Pike.

No other National Landmark lands or natural preserve areas are located in the immediate vicinity of the site.⁹

⁹As listed in the National Register of Historic Places.

IV. PROPOSED ALTERNATIVES

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INTRODUCTION

The scope of alternatives presented relates directly to the objective of the proposed action to provide for program expansion on the Bethesda Reservation within site and community constraints. There are numerous factors which will determine the final level and mix of programs and support activities at the Reservation. Programmatic decisions beyond the scope of this DEIS will determine what programs are funded and how they are funded. Policy decision areas include extramural (contract) vs. intramural program funding and determination of the location for any given intramural program. Other variables include national priorities, congressional funding, and medical discoveries. All of these factors will determine the level and timing of the Bethesda Reservation development plan implementation. Thus, the reasonable alternatives should focus on alternative phasing of the full development plan. There are three options:

- Full development by 1990
- Full development after 2000
- No action

FULL DEVELOPMENT BY 1990

This alternative assumes that the demand for additional program and support activities will be as projected in the development plan. This alternative examines the impact of implementing the development plan and work force increases at Bethesda consistent with the 20 year time frame envisioned in the 1972 Revised Master Plan.

FULL DEVELOPMENT AFTER 2000

This alternative assumes that the demand for programs and support activities at the Bethesda Reservation will be slower than projected in the development plan. Implications of this alternative are that total demand for biomedical research will be slower, funding will be delayed, policy decision will favor extramural research, and/or policy decisions will favor other locations for the research activities. Any of these program decisions could slow the rate of development at the Reservation. This alternative, therefore, examines the environmental

impact of a slower rate of physical development on the Bethesda Reservation with full development occurring after the year 2000.

NO ACTION

As is required, the no action option is also evaluated. This assumes that there will be no increase in biomedical research at the Bethesda Reservation. This option assumes that no further physical development will take place on the Bethesda Reservation and that none of the projected demolitions of building or movement off the Reservation of certain functions will take place.

UNREASONABLE ALTERNATIVES

Two other alternatives were considered unreasonable: implementation of the development plan before 1990 or a major change in the land use of the site.

First, while it is possible that a faster rate of program demand could take place, it is not considered reasonable to assume that NIH could implement the significant construction program required to accommodate the additional programs.

Secondly, the NIH campus represents an enormous capital investment in research and care facilities and has become an integral part of the institutional structure of the Bethesda area. Thus, alternatives which suggest a major change in land use for the Bethesda Reservation must also be considered unreasonable.

V. ENVIRONMENTAL EFFECTS



FULL DEVELOPMENT BY 1990

The Revised Master Plan for 1972 presents a 20 year plan for the development of the NIH Bethesda Reservation. The objective of the plan is to provide NIH with the capability to expand the programs and support services on the Reservation in response to the expected increase in demand for biomedical research. This section analyzes the probable environmental effects of implementing the proposed development plan by 1990. Each of the environmental systems is presented according to DHEW procedures.¹ Where any "initial criteria" defined in the DHEW procedures is met, the probable effects and their significance (along with applicable mitigation measures) are discussed for the environmental system.² Where no "initial criteria" are met, a summary of the probable effects is presented to give the reader an understanding of the broad range of effects that could be expected from implementing the development plan within the projected time period.

The probable effects of full development by 1990 are generated primarily from the additional employment and from the construction of almost \$200 million in facilities over the 20 year period.

- Employment capacity at full development will be 15,000. This represents an increase of 4000 over the existing facility capacity. The estimated average employment will increase 39% to about 14,600 from the existing employment level of 10,500. Daily outpatient trips will increase by about 500 persons to a total of 800 per day, and about 500 additional visitors will be attracted to the site when conference activities are scheduled.
- The projects represent an increase of about 1.8 million square feet to the Reservation's total of 3.8 million square feet. The total net floor space at NIH with full development is projected to total slightly over 5 million square feet (net after building demolitions). While the precise level of construction expenditures is still uncertain, individual project costs are expected to vary from \$1

¹A detailed evaluation of effects by each environmental system is presented in Volume II of the Environmental Analysis.

²See footnote 3 on page 2 for definition of initial criteria.

million to about \$85 million with a total estimate of about \$200 million by 1990 (current dollars).

It is from these two basic impact generators that the probable effects on the environment arise. The construction program generates disruption to the site and vicinity in such areas as possible air pollution, traffic congestion, soil erosion, and water pollution.

The additional employment on the Reservation generates both direct and indirect effects on the natural and technological systems. It is the indirect effects that generate the major areas of possible adverse impacts. The added employment creates demands on the basic infrastructure of the site and community--solid waste, sanitary sewers, water lines, roadways, and housing. From these effects additional air, water, and noise pollution could result. Thus the focus of this environmental impact statement is on those direct and indirect effects which could be generated by a significant construction program and addition to the employment base of the Reservation.

NATURAL SYSTEMS

LAND USE AND DEVELOPMENT

As the projects proposed in the 1972 Master Plan are developed, there will be some reorganization in the functional land use distribution on the site. Project development, however, will create little change in the overall distribution of floor area among various functions.

As a result of full development, the proportion of the NIH site covered by buildings, roadways, and parking will decrease by seven percent due to the elimination of almost all surface parking areas (Table 2). Most projects will be located within the currently built-up area of the site, thus maintaining large portions of the site's open and landscaped areas.

TABLE 2 CHANGE IN DEVELOPED AREAS, NIH SITE

| <u>Type of Developed Area</u> | <u>Square Feet Covered (millions)</u> | | <u>Percent Change</u> |
|---|---------------------------------------|---------------|-----------------------|
| | <u>Existing</u> | <u>Future</u> | |
| Buildings | 1.3 | 1.6 | +23% |
| Parking ^a | 1.6 | 0.9 | -43% |
| Roads, walks | 1.3 | 1.4 | + 8% |
| Total Site Coverage | 4.2 | 3.9 | - 7% |
| Total Acres Covered | 96 Acres | 90 Acres | |
| Percent of Site Covered (Total Site=306 acres) | <u>31%</u> | <u>29%</u> | |
| Note: ^a Surface Parking | 1.54 | .25 | |
| Structures (MLP's) | .06 | .66 | |

Source: Estimates by Dalton·Dalton·Little·Newport, 1975.

Since the type of land use or activities proposed for development will be similar to those which currently exist on the site, there will be no change generated in area land use patterns. The proposed development is consistent with area plans and development goals, particularly in regard to locating future development in existing built-up areas, with easy access to mass transit.

LAND AND WATERS

No impacts on bedrock geology are expected and only minimal effects are projected in water quality, storm water runoff and sedimentation. Increases in runoff and sedimentation will be minimized by compliance with the state erosion and sedimentation regulations during construction and the Montgomery County Soil Conservation District regulations on storm water control.¹ Following full development, runoff and sediment production will decline slightly because of the increase in pervious surfaces.

The fecal "strep-to-coliform" ratio suggests that the source of some intermittent pollution of the streams may come from washing operations.² When these operations are discontinued, water quality should improve.³ As long as area residents use the southern part of the site as a "dog run," it is likely that coliform counts will remain high in the direct vicinity of the site. Downstream water quality measures indicate that the stream cleans itself to acceptable levels before entering Rock Creek.

Bleed-off water from the cooling towers is discharged into the stream and it will require an NPDES permit.⁴ NIH is currently conducting studies on methods to cleanse and recycle the cooling tower discharge water. If this is done, chemical levels in the stream will fall and some vertebrate populations may return.

¹Sediment Control Program for Montgomery County, Maryland, MSCD. 1965.

²The fecal "strep-to-coliform" ratio is formulated from data concerning fecal coliform and fecal strep counts gathered at on-site sampling points. A high strep-to-coliform ratio (i.e. a ratio greater than 1) is an indication that the water has probably been polluted by animal wastes rather than human wastes.

³Washing operations are undertaken at Buildings 14 and 28. These facilities are scheduled to be removed.

⁴An NPDES (National Pollution Discharge Elimination System) permit was filed in the Fall of 1975 for the entire NIH reservation.

AIR QUALITY

Five major pollutants are emitted by the NIH facility and related traffic. As shown in Figures 1 through 6, even with full development, total emissions of each pollutant will decline primarily because of more stringent emission control measures, especially with respect to automobiles.

The NIH facility affects air quality through traffic and heating:

- Traffic volumes will increase with new facilities, but emission controls and changes in commuter habits (such as car pooling and mass transit usage) will produce a net decline in carbon monoxide, hydrocarbon, and oxide of nitrogen emissions.¹ The declines are shown in Figures 1, 3, and 4. Figure 2 shows the worst eight-hour carbon monoxide concentration expected in the immediate vicinity of the NIH Reservation. The decline shown in Figure 2 is typical for the area.
- Boiler Plant emissions will decline sharply in mid-1975 in response to Maryland regulations which require low sulfur fuel and reduced particulate concentrations. Total emissions will increase thereafter with new Master Plan construction but, as shown in Figures 5 and 6, will remain well below current emission totals.

Table 3 shows the annual boiler emissions at full development and the assumptions used in the analysis. At full development in 1990, sulfur oxides will be reduced by 31 percent from 1974 levels and particulates will be reduced by over 36 percent.

¹This analysis uses EPA HIWAY model version 97312 with the following assumptions: 3 ppm peak hour concentration, 1 ppm off-peak; receptor distance 3.05 meters; stability class F; windspeed 1 meter/second; wind angle 22.5° w.r.t. highway; vehicle speed 25 mph (peak and off-peak assumed the same).

FIGURE 1 TOTAL CARBON MONOXIDE EMISSIONS

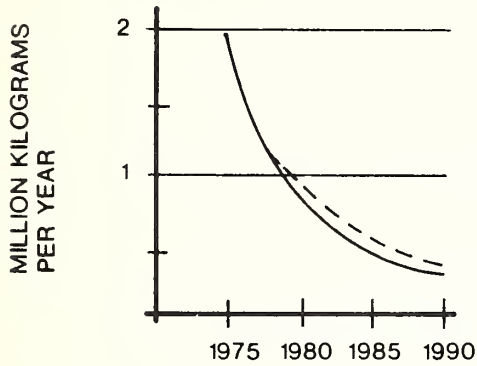


FIGURE 2 MAXIMUM EIGHT HOUR CARBON MONOXIDE CONCENTRATION ADJACENT TO NIH

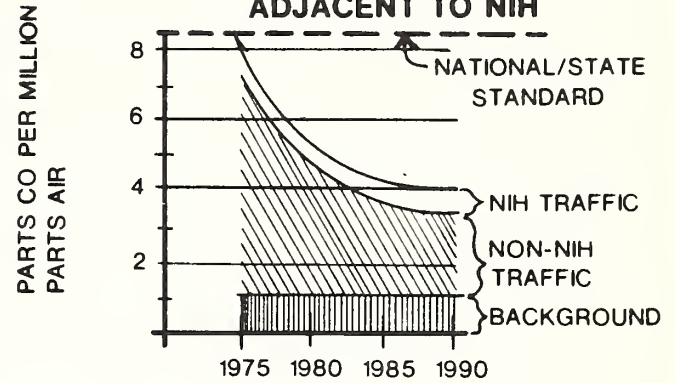


FIGURE 3 TOTAL HYDROCARBON EMISSIONS

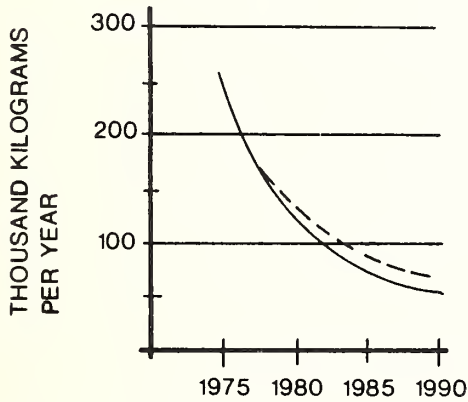


FIGURE 4 TOTAL OXIDE OF NITROGEN EMISSIONS

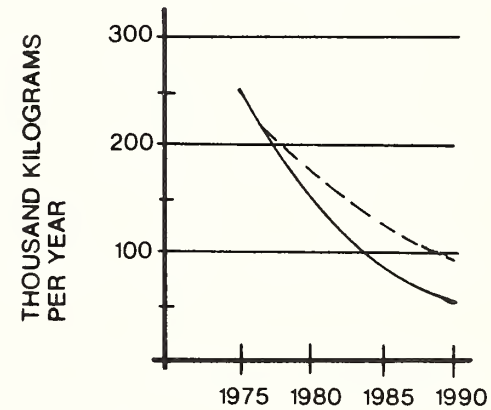


FIGURE 5 SULFUR OXIDES-BOILER EMISSIONS

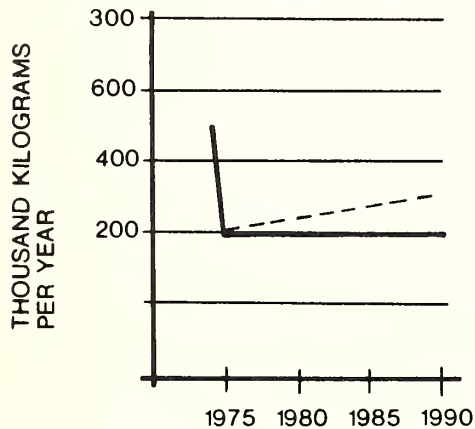
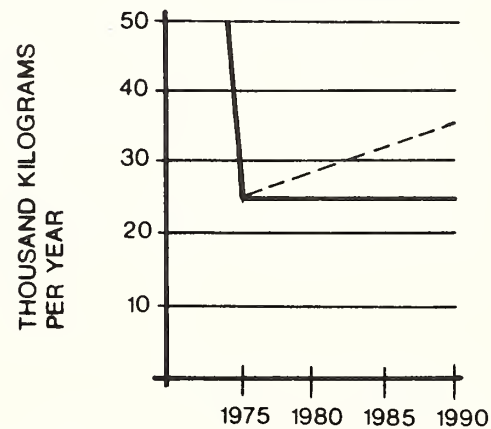


FIGURE 6 PARTICULATES-BOILER EMISSIONS



— No new development
 - - - Continuous development completed in 1990
 Source: Dalton·Dalton·Little·Newport, 1975

**TABLE 3 ESTIMATED NATIONAL INSTITUTES OF HEALTH
ANNUAL BOILER EMISSIONS**

| | <u>Floor Area</u> (Square feet) | <u>Fuel Use</u> Gallons/yr. | <u>Discharge</u> 1000 CF/yr. | <u>Sulfur Oxides</u> KG | <u>Oxides</u> Tons | <u>Particulates</u> KG | <u>Tons</u> |
|----------------------------|------------------------------------|--------------------------------|---------------------------------|----------------------------|-----------------------|---------------------------|-------------|
| 1974 Base- line | 4,806,900 | 8,785,000 | 19,456,000 | 705,200 | 776 | 50,630 | 56 |
| Ful Devel- opment Total | 5,995,500 | 10,962,200 | 24,278,000 | 488,100 | 537 | 32,105 | 35 |

Assumptions: Fuel/Floor^a = 1.8284 $\frac{\text{Gallon}}{\text{Year}}$ /square foot

Exhaust/Fuel^b = 2214.7 CF/Gallon

| <u>Stack Gas Concentrations</u> | <u>Thru June 1975</u> | <u>Post June 1975</u> |
|---------------------------------|----------------------------|----------------------------|
| Sulfur Oxides ^c | 1.28 gram/m ³ | 0.71 gram/m ³ |
| Particulates ^d | 0.0919 gram/m ³ | 0.0467 gram/m ³ |

a. Based on 1974 records - 8,785,052 Gal. ÷ 4,804,900 square feet of building

b. Based on 1974 Syska & Hennessey Study:

$$\frac{18,979 \text{ BTU}}{\text{Pound Fuel}} \times \frac{8.1785 \text{ pound}}{\text{Gallon}} \times \left(\frac{.2378 \text{ CF}}{\text{Minute}} \times 10^3 \frac{\text{Hour}}{\text{BTU input}} \right) \times \frac{60 \text{ Minutes}}{\text{Hour}}$$

c. Based on 1974 Syska & Hennessey Study, P. C-1:

462.6 ppm SO_x @ 0.9% Sulfur; thus 257 ppm (0.71 gram/m³) SO_x @ 0.5% Sulfur

d. Based on 1974 Syska & Hennessey Study, p. C-1:

Average 0.04015 grain/SCFD; .03932 grain/SCFD @ 50% excess air
 Thru June 1975: .04015 grain/SCFD x gram/15.4324 grain x 35.3145 CF/meter³
 Post June 1975: (.04015/.03932 x .02)grain/SCFD x (2.2883 CF gram/meter³ grain)

The figures in Table 3 are based on direct relationships among floor area, heating demand, fuel consumption, and effluent volume; constant gas concentrations are assumed. These assumptions must be reviewed periodically because a number of factors will influence the results.²

Construction and demolition activities will produce dust and some gaseous pollutants. The effects on ambient air quality

²These factors include the type of emission controls on boilers, the type of fuel used and the final design and size of the proposed facilities. In addition, stringent energy conservation programs would further reduce air pollution.

will be minor because the Master Plan projects will be built over a rather long period. The temporary effects of each project will be further limited by contractors' compliance with all regulations in effect.³

Regional air quality is expected to improve with the enforcement of current regulations, the implementation of proposed regulations and the completion of Metro.

NIH will comply with all federal, state, and local air quality maintenance regulations in effect.⁴ At full development, all categories of NIH emissions will be below current (1975) levels. Thus, the air quality of the vicinity and the region will not be adversely affected by the proposed action.

³Depending on the type of project being constructed, the contractor must comply with GSA/DHEW/the State of Maryland and/or Montgomery County regulations. In all cases, the contractor must comply with NIH Manual #10M, "General Conditions to NIH Construction Contracts" and any "special conditions" in the contract.

⁴A complete list of applicable air quality regulations is found in Volume II, pages 76-77 of the Environmental Analysis. These include both existing and proposed federal, state and local regulations.

THE LEVEL OF SOUND

Probable Environmental Effects

Implementation of the Revised Master Plan will generate noise in three ways:

- Capital Activities
- Nontraffic Related Operational Noise
- Traffic Related Noise

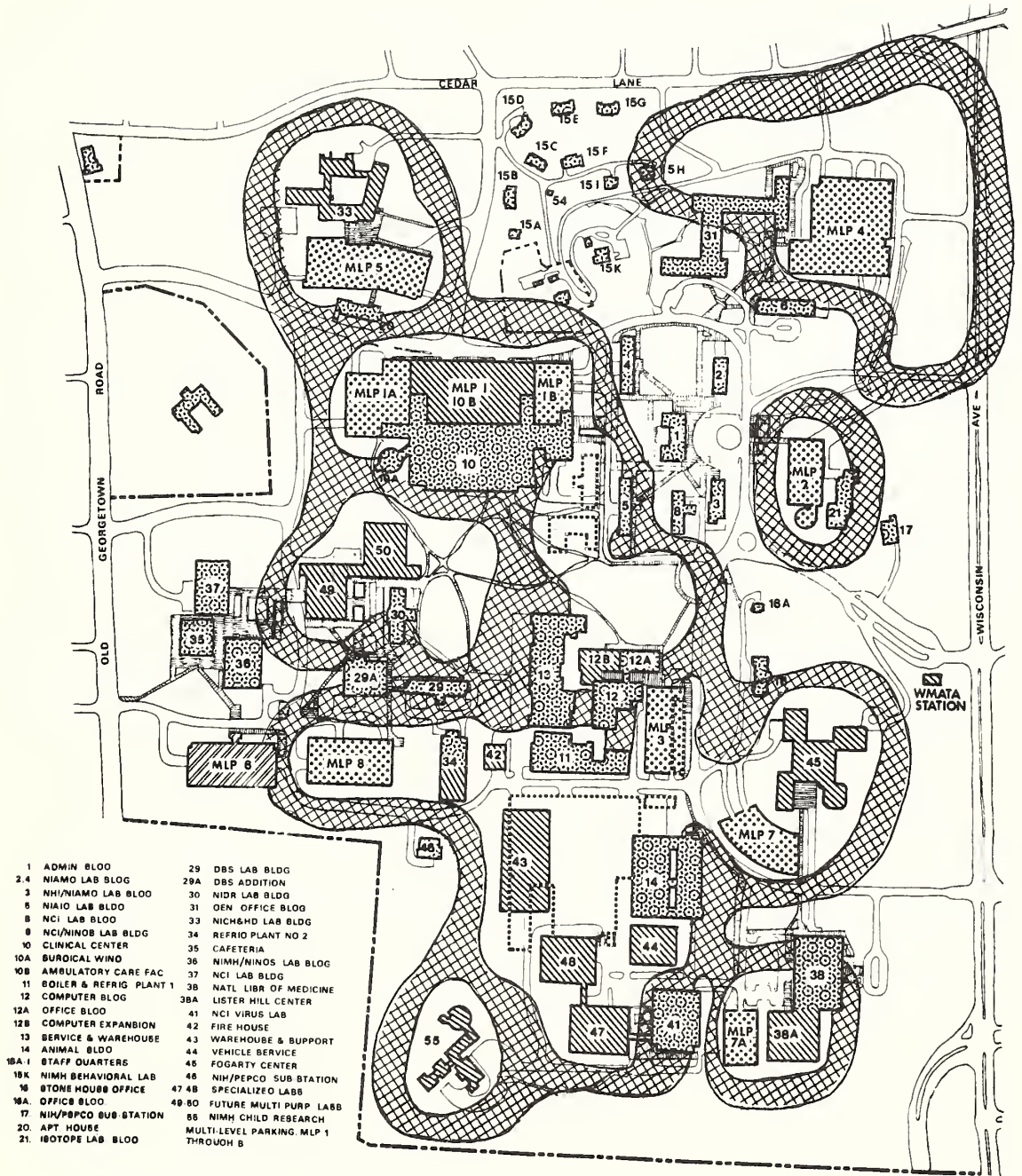
Capital Activities. - All of the contemplated projects will produce noise. Demolition/construction noises are relatively short-term, with the noisiest phases being the initial ones. This noise is attenuated naturally by topography and distance and will be considerably minimized at the source through judicious scheduling and use of equipment.¹ Typical construction noises can be localized. They will not affect indoor activities in nearby buildings, nor are they likely to elicit complaints from adjacent residential communities.

Map 6 shows worst condition construction noise boundaries if all proposed construction activities on-site were undertaken simultaneously. Only during the removal of parking lots adjacent to MLP 4, could the county noise ordinance be violated at the property line.

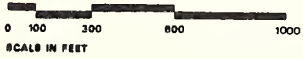
Operational Noise. - Operational noise will not be an environmental problem at NIH or for the surrounding areas. The generous buffer zone around the NIH site will contribute greatly to assuring that the 55 dBA level will not be exceeded

¹The noise levels of construction equipment used on NIH contracts are regulated by GSA, DHEW, NIH, the State of Maryland, and/or Montgomery County, depending upon the type of facility being constructed. For example, the Environmental Protection Criteria, paragraph 42.8 of the GSA Specifications, requires that noise levels must not exceed the limit established for each type of construction equipment. Where field sound measurements reveal sound levels exceeding the established limits (measured at 50'), the contractor is instructed to cease operating such equipment and repair or replace it with equipment complying with the standards. In addition, "special conditions" may also be included in construction contracts to control unusual situations (depending on the terrain, type of equipment, etc.). The Montgomery County Noise Control Ordinance (Chap. 31, Montgomery County Code) is similar to the above regulation.

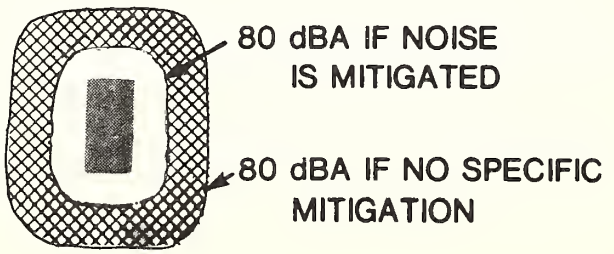
MAP 6 SIMULTANEOUS CONSTRUCTION NOISE AREAS



- | | |
|----------------------------|--------------------------------------|
| 1 ADMIN BLDG | 29 DBS LAB BLDG |
| 2.4 NIAMO LAB BLDG | 29A DBS ADDITION |
| 3 NHI/NIAMO LAB BLDG | 30 NDR LAB BLDG |
| 5 NIAIO LAB BLDG | 31 OEN OFFICE BLDG |
| 8 NCI LAB BLDG | 33 NICH&MD LAB BLDG |
| 9 NCI/NINOB LAB BLDG | 34 REFRIG PLANT NO 2 |
| 10 CLINICAL CENTER | 35 CAFETERIA |
| 10A BURIOCAL WIND | 36 NIMH/NINOS LAB BLDG |
| 10B AMBULATORY CARE FAC | 37 NCI LAB BLDG |
| 11 BOILER & REFRIG PLANT 1 | 38 NATL LIBR OF MEDICINE |
| 12 COMPUTER BLDG | 38A LISTER HILL CENTER |
| 12A OFFICE BLDG | 41 NCI VIRUS LAB |
| 12B COMPUTER EXPANSION | 42 FIRE HOUSE |
| 13 SERVICE & WAREHOUSE | 43 WAREHOUSE & SUPPORT |
| 14 ANIMAL BLDG | 44 VEHICLE SERVICE |
| 15A-1 STAFF QUARTERS | 45 FOGARTY CENTER |
| 16 NIMH BEHAVIORAL LAB | 46 NIH/PEPCO SUB STATION |
| 16 STONE HOUSE OFFICE | 47 48 SPECIALIZED LABB |
| 16A OFFICE BLDG | 49-80 FUTURE MULTI PURP LABB |
| 17 NIH/PEPCO SUB STATION | 86 NIMH CHILD RESEARCH |
| 20 APT HOUSE | MULTI-LEVEL PARKING, MLP 1 THROUGH 8 |
| 21 ISOTOPE LAB BLDG | |



- | | |
|--|------------------|
| | BLDG. REMOVED |
| | EXISTING BLDG. |
| | PROPOSED BLDG. |
| | EXISTING PARKING |
| | PROPOSED PARKING |



at the property line. At NIH, the noisiest limiting cases are predicted to be within all of the legal and desirable goal levels.

It is not anticipated that noise levels will disturb interior activities, since the buildings will attenuate noise transmission by approximately 35 dBA.

It is possible that a transmitter-receiver facility will be associated with the proposed Lister Hill Center (Building 38A). There would be receiver facilities on the roof of the building and a remote transmitting tower.

The Department of Defense Electromagnetic Compatibility Analysis Center conducted a survey and concluded that the transmitter-receiver proposal would not produce effects on surrounding residential or commercial frequencies because it would operate above those of radio and TV.²

Current operations at the National Library of Medicine have not caused complaints of interference. The Center suggested a survey of some commercial telephone bands to insure non-interference. This survey will be conducted before activation of the facilities.

Traffic Related Noise. - On-site traffic noise will have the greatest effect on people and activities on the Reservation. Even so, noise levels will be within all pertinent accepted standards.³

Table 4 shows the maximum levels and the amount of change over 1974 ambient levels. At full development, a maximum increase of 4.5 dBA is projected on-site if all traffic from all projects pass in combination over any one road segment. This represents a worst-case situation. Even this unlikely increase will not cause the sound level to exceed any federal noise pollution goals or legal requirements. This "worst condition" would represent a barely audible increase.

²Electromagnetic Compatibility Analysis Center, "EMC Analysis of NIH-Proposed Communication System" (R-397) Jan. 31, 1974.

³Applicable standards include:

- Montgomery Co. Noise Ordinance (Effective Oct. 1976)
- Noise Control Act of 1972 (PL 92-574)
- Federal Highway Administration (FHWA) Standards.

TABLE 4 ON-SITE TRAFFIC NOISE ENVIRONMENT

| | Max. Predicted Level (L ₁₀) @50' Sum of Project Increases ^a | Change Over 1974 Ambients ^b | Degree of Impact At Sensitive Areas ^c |
|------|---|---|---|
| 1980 | 70.5 dBA | 4.1 | None |
| 1985 | 69.7 dBA | 3.3 | None |
| 1990 | 70.6 dBA | 4.2 | None |

- Note: a. This represents the noise level that would occur if all additional traffic were to pass over any one road segment. Even this occurrence will not create impacts.
- b. An increase of less than 3 dBA is at the threshold of perception in this environment. An increase of 3-5 dBA is noticeable by most, but is not disturbing (See Table NS-5).
- c. Refers to areas where a high noise level would disrupt or interfere with normal activities.

Source: Dalton·Dalton·Little·Newport, 1975.

For full development at NIH, the increases in off-site vicinity noise levels will be very small. Table 5 shows that the maximum change in 1990 will be approximately 4 dBA.

TABLE 5 OFF-SITE TRAFFIC NOISE ENVIRONMENT

| | Change ^a Over 1974 <u>Ambients</u> | Change Due ^a to NIH Full <u>Development</u> | Degree of ^b Impact at <u>Sensitive Areas</u> |
|------|---|--|---|
| 1980 | +3 dBA | +2 dBA | None |
| 1985 | +4-5 dBA | +2-3 dBA | None |
| 1990 | +5-8 dBA | +1-4 dBA | None |

Note: a. See Note b on Table 4.

b. See Note c on Table 4.

Source: Dalton·Dalton·Little·Newport, 1975

Significance

Noise will not be a significant environmental problem with implementation of the proposed full development plan at the Bethesda Reservation. While there is the potential for violating a noise ordinance during the removal of surface parking lots, the environmental impact will be extremely low. This is for several reasons:

- The probability that the noise ordinance will be violated is low. With particular attention to equipment use, it is possible to avoid violation.
- The magnitude of this noise, if it occurs, will be very low and indistinguishable from traffic noise on Rockville Pike.
- There are no residential, office, or other institutional populations which will be affected by the noise violation if it occurs.
- The noise generation will be very short in duration and will occur only while the parking lot is being removed and returned to an open landscaped area.

POPULATIONS

PLANT AND ANIMAL POPULATIONS

Because of the decrease in surface parking areas, approximately 3 percent of the site will be reclaimed as landscaped areas. A slight reduction in surface water runoff is anticipated. Construction will require the removal of roughly 80 trees in the northwest corner of the site. This represents about 11 percent of the canopy wooded area on-site. While this stand of trees is the largest on the site, its basic integrity will remain with proper mitigation during construction. This stand cannot be considered a natural environment because it is entirely landscaped and no natural understory exists. No other project will impact any of the other wooded areas on the site.

The impact of full development on animal populations is minimal. No species of rare or endangered species are known to be present on-site.

Mitigation of the effects of forest canopy removal will take two forms. First, remaining members of the woodland community should be protected during construction from:

- Wounds from construction equipment,
- Excessive soil compaction around root systems from surface storage of building materials and surface vehicular traffic or parking,
- Excessive lowering of the local groundwater table during excavation by a planned irrigation program,
- Excessive runoff from construction machines (oil, gasoline and other chemicals).

Secondly, increased surface water runoff from the area where woodland is removed will be controlled as outlined in the section on Land and Waters.¹

¹See footnote 1 page 37.

HUMAN POPULATIONS

Probable Environmental Effects

A slight shift in employee occupational types will result from the proposed development. An increase in professional/research positions is anticipated.² As a result of any new project, on-site population density will also increase. With full development, a maximum of 4,500 employees will be added, increasing on-site density about 35 percent to 49 employees per acre.

At full development, roughly 2,000 new households will be added to the region. It is projected that 55 percent to 60 percent of these households will reside in Montgomery County. NIH will account for approximately .5 percent of the county's projected population growth by 1983.

Between 500 and 875 moderate income employees will be added with full development. It is anticipated that most of these employees earning less than \$10,000 (1974 dollars) will be existing residents of the region, rather than new entrants to the area.

With full development, transient populations will increase. An additional 800 outpatients and 500 visitors are expected daily.

Indirect effects of increased population on the technological systems generate greater effects than the direct density increase on the site or in the residential community. These impacts are discussed in their relevant sections such as transportation, housing, and water/sewer systems.

Significance

With over 300 acres, the site is more than adequate to handle the increased population and no adverse effects are projected from the increased density alone. However, this added population will generate impacts on utility, housing, and transportation systems. Significance of these effects must be

²Existing employment is concentrated in four occupational groups, professional and scientific (36%), subprofessional and technical support (16%), administrative, clerical and office services (37%), and plant operation and maintenance (11%).

assessed in close relationship to the capacity of various technological systems serving the site (see Energy, Water and Sewer, and Transportation Systems).

TECHNOLOGICAL SYSTEMS

ENERGY SYSTEMS

The Heating and Cooling Systems

The heating requirements of full development would generate a net addition in steam demand of approximately 105,000 pounds/hour. This would bring the system's required demand to 70 percent of the current 500,000 pounds/hour capacity of the boiler plant.

The proposed future expansion will generate major additions to the demand for cooling capacity. The diversified demand from the new projects is about 12,500 tons, which is equal to 86 percent of the current demand. Total demand is estimated at 24,400 tons, while total system capacity will be over 30,000 tons. Under extreme peak conditions, the standby unit now being built will be required to generate a sufficient supply of chilled water.

No direct effects are projected from this increased demand on the cooling system.¹

The Electrical System

Full development at NIH will increase peak electric demand on the Reservation by 59 percent to approximately 60 Megavolt Amperes (Table 6).² Total annual consumption is expected to rise from 159 million kilowatt hours (KWH) to about 193 KWH.

NIH is allocated the total available power (38 MVA) from the West Substation, but currently utilizes only 34 percent of the substation capacity. NIH is allocated 30 MVA (67%) and NNMC is allocated approximately 15 MVA (33%) from the Woodmont Substation. Existing demand from NIH and NNMC is approximately 71 percent of allocated power³ (Table 7).

¹Indirectly, of course, there will be the added demand for energy of approximately 30 million kilowatt hours annually. See "The Uses of Energy Resources" later in this section.

²Equivalent to about 55 Megawatts.

³NNMC has an existing peak demand of 8.5 MVA from the East Substation. The Woodmont Substation may expand to 60 MVA (firm) by 1978 to handle the increased demand of the new NNMC hospital facilities being constructed (Pepco, 1975).

TABLE 6 PROJECTED ELECTRICAL DEMAND BY NIH
(Peak MVA Demand)^a

| | <u>Lgt./Power</u> | <u>Cooling</u> | <u>Total</u> |
|---------------------|-------------------|-------------------------|--------------|
| Total New Projects | 9.1 | 19.3 | 28.4 |
| Buildings Removed | -1.9 | -4.2 | -6.1 |
| Existing Demand | <u>21.8</u> | <u>16.2^b</u> | <u>38.0</u> |
| Total Future Demand | 29.0 | 31.3 | 60.3 |

Note: a. Peak MVA (Megavolt Ampere) demand is a measure of the maximum electrical power requirements NIH places on the Pepco Substations servicing the site. The peak demand is usually reached only occasionally during summer months when the need for air conditioning is greatest. MVA is equivalent to approximately 1.1 MW (Megawatts).

b. Individual demand for cooling may seem low, however, 6,000 tons is not included because it is steam driven. Its energy demands are part of the overall fuel oil consumed on site.

Source: Nottingham, 1968; Dalton·Dalton·Little·Newport, 1975.

TABLE 7 NIH SUBSTATION CHARACTERISTICS

| | <u>Woodmont (East)</u> <u>Building 17</u> | <u>NIH (West)</u> <u>Building 46</u> | <u>Total</u> |
|----------------------------------|--|---|--------------|
| Firm Capacity (MVA) ^a | 45 | 38 | 83 |
| Peak Capacity (MVA) ^b | 58 | 57 | 115 |
| Expansion Potential | 15 | 42 | 57 |
| Total Potential Capacity | 60 | 80 | 140 |

Note: a. Firm Capacity - Capacity of N-1 components (transformers) in service. This is a conservative rating allowing for the complete shut-down of one transformer without any significant reduction in service.

b. Peak Capacity - (Also called Installed or Name Plate Capacity) refers to the maximum possible output of the substation.

Source: Pepco, 1975.

As NIH demands increase, the current residential use of the substations (particularly the West Substation) will be transferred to other substations in the area and the excess capacity of the on-site substations made available to NIH. Thus, there is sufficient current capacity for full development and with the projected expansion of the two substations, more than adequate capacity exists to service full development at NIH (Table 8). In conversations with the Pepco area representative, it was determined that there would be no problem in transferring residential use to other area substations.

The increased demand for electrical power on the NIH reservation will not adversely affect the ability of the Potomac Electric Power Company to provide service to the local area or the region.⁴

TABLE 8 NIH FULL DEVELOPMENT ELECTRICAL DEMAND
AS A PERCENT OF TOTAL SUBSTATION CAPACITY^a
(Peak MVA Demand)

| | <u>Lgt./Power</u> | <u>Cooling</u> | <u>Total</u> |
|---|-------------------|----------------|--------------|
| Full Dev. Demand as a % of Existing Firm Capacity | 35% | 38% | 73% |
| Full Dev. Demand as a % of Potential Firm Capacity | 21% | 22% | 43% |

Note: a. Total existing capacity is 83 MVA; total potential capacity is 140 MVA.

Source: Dalton·Dalton·Little·Newport, 1975.

⁴Mr. Henry Goldsborough, Pepco area representative, 1975.

Fuel Uses

Current #6 fuel oil use at NIH is approximately 8.8 million gallons annually. The combined development of all projects (less removals) would add about 2.3 million gallons annually. The total demand at full development would be 11.1 million gallons annually.

The demand for natural gas on-site would increase about 60 percent with full development. The major use in bunsen burners and laboratory heating devices would total 31,500 therms annually. Total use at full development would equal about 84,000 therms annually. The use of natural gas on-site would still be very limited (equivalent to the heating of about 32 homes with natural gas).

Since a moratorium is in effect for new connections to natural gas lines, any additional demand for natural gas by NIH must be considered as an increase which cannot be accommodated by the existing system. As a result, full development will require the use of other energy sources, such as liquefied gas.

The Uses of Energy Resources

The new projects and their associated employees will increase energy consumption by about 23 percent, or an equivalent of almost 12 million gallons of gasoline annually (Table 9).

TABLE 9 NEW DEVELOPMENT AS A PERCENTAGE OF TOTAL ENERGY DEMAND

| | <u>% On-Site Energy Consumption</u> | <u>% Employee Energy Consumption</u> | <u>Weighted Average % of Full Dev.</u> |
|---------------------|-------------------------------------|--------------------------------------|--|
| Existing Site (net) | 80 | 73 | 77 |
| New Projects | 20 | 27 | 23 |

Note: Percentage contribution to total consumption: 60% on-site, 40% employee households.

Source: Dalton·Dalton·Little·Newport, 1975.

At full development, energy consumption is projected to increase from 4.7 trillion BTUs to almost 6 trillion per year (equivalent to 50 million gallons of gasoline--Table 10). Automobile energy consumption will not change appreciably from the current level because total trips at full development will roughly equal the current number of trips due to the impact of mass transit usage.

TABLE 10 MAJOR ENERGY USE AT FULL DEVELOPMENT AND
EMPLOYEE HOUSEHOLDS (In BTU Equivalents
Annually)

| | <u>Site</u> | <u>Employee Household</u> | <u>Total^b</u> | <u>Equivalent Gal. of Gasoline (Millions)</u> | <u>% Increase over 1975</u> |
|------------------------|-------------|---------------------------|--------------------------|---|-----------------------------|
| Heating | 1,750 | 850 | 2,600 | 21.7 | 30% |
| Cooling/ Electrical | 1,830 | 1,150 | 2,980 | 24.9 | 29% |
| VMT ^a | _____ | <u>400</u> | <u>400</u> | <u>3.3</u> | <u>0%</u> |
| Total | 3,580 | 2,400 | 5,980 | 49.9 | |
| % Increase over 1975 | 23% | 33% | 27% | | |

Note: a. VMT (vehicle-miles-traveled) equal to 1975 because of Metro (see Transportation analysis).

b. Not total added energy use to region because many of the employees already reside in area.

Energy conservation is a major concern at NIH in the design of buildings and the choice of mechanical systems. The design of existing facilities (such as Buildings 36 and 41) incorporate many energy conservation elements. Lighting studies have been conducted to lower energy consumption and use heat output as a secondary source. Proposed projects which have progressed to the design stage (such as 38A and 10B) incorporate advanced energy conservation practices in the design and choice of mechanical systems. This commitment by NIH will be continued in the development of all proposed projects in the development plan.⁵

5Methods of conservation include:

- a. Installation of water saving devices to cut water consumption and sewage discharge, less direct lighting, dimmers, and high ballast lighting.
- b. Total energy systems use waste heat from the electrical generation process for heating and cooling. Because this would require a total new power plant and a much larger amount of land, it is not a feasible option. (continued)

Policies which will lower employee vehicle-miles-traveled (VMT), such as increasing mass transit usage or reducing the availability of parking will also result in energy savings. At full development, the projected energy consumption from work related automobile trips will be equivalent to the current level of consumption because of increased car occupancy rates and mass transit utilization. As gasoline mileage increases, total consumption in this area will fall below current levels.

5 (continued)

- c. Use of solid waste as another method of energy conservation and recovery. NIH will be generating about 35 tons per day of common refuse. NIH is planning to be a part of a county-wide energy recovery plan which will be implemented in the next few years. Thus NIH's solid waste will contribute to energy conservation.

WATER AND SEWER SYSTEMS

Probable Environmental Impact

The Water Distribution System. - The average monthly water consumption for full development will increase by 26 percent to 51 million gallons (mg) per month.¹ The maximum monthly water consumption for full development will range from 1.2 to 1.4 times the average monthly consumption or from 61 mg/month to 72 mg/month. Both the average and maximum projected water usage at full development is well within the Washington Sanitary Commission (WSSC) contracted level of 86 mg/month.²

The water supply lines in the vicinity of the site serving NIH are more than adequate to service full development of the Reservation.

The regional effect of full development will place a new demand of less than one-half of one percent on the capacity of the Potomac River water purification facility. In the context of projected regional growth, NIH development is one part of the cumulative increase in water demand affecting the tight water supply situation in the region. The water supply system has exceeded the minimum recorded flow during drought periods.³

The Sanitary Sewer System. - Table 11 presents the added generation of sanitary sewage resulting from full development. Full development will increase sewage generation by approximately 25 percent over the existing volume of 1.2 million gallons daily (mgd).

¹Based on historical water consumption data.

²NIH is implementing a significant water conservation program on-site. See "Sanitary Sewer System" later in this section.

³Comprehensive Ten Year Water and Sewerage Plan, FYS 75-84, Montgomery County Maryland, 1974.

TABLE 11 ESTIMATED SANITARY SEWAGE GENERATION

| | <u>Estimated Average Daily Flow^a</u> | <u>Percent of Full Development</u> |
|--------------------------------------|---|--|
| Total added by new projects (gpd) | 406,000 | 34 |
| Less Buildings Removed (gpd) | -113,000 | - 9 |
| Net Added (gpd) | 293,000 | 25 |

Note: a. Rounded to nearest (000) based on current waste/water ratio of .81.

Source: Dalton·Dalton·Little·Newport, 1975.

Based on peak water consumption, the added discharge into the sanitary system will not exceed the authorized discharge of 4250 gallons per minute (gpm) at the northeast corner of the Reservation. The contract between the General Services Administration and WSSC, limits the discharge into the 10 inch sewer on the southeastern portion of the site to 430 gpm. Less than one-half of the authorized flow is currently being used. The capacity of this line to the interceptor is sufficient to meet all projected demand.

The treatment capacity of the region is currently overtaxed and line capacity of the Rock Creek Interceptor between NIH and Blue Plains treatment facility is near or over capacity in the District of Columbia. Thus, any addition to flows would further strain the system. This situation has caused WSSC and Washington, D. C. to agree to add no more discharge to the Rock Creek Interceptor.

Storm Sewers. - The storm sewer system proposed in the 1968 Utility Master Plan, with modifications for changes in building locations and size, is adequate for the storm water discharge from the site. In addition, there will be a projected decrease in runoff at full development.

Any effects of full development on the storm sewer system will be minimized by:

- NIH compliance with storm water retention requirements and sediment control during construction.⁴
- Concurrent construction of multi-level parking structures which would increase pervious surfaces through the removal of surface parking.
- Construction of at least temporary storm water retention basins for individual projects to control for at least the mandatory two year storm.⁵

Significance

Water System. - While water demand at full development is within contracted amounts and area line capacity is adequate, there is the potential for a significant impact on the regional water supply situation. NIH's increase in water demand, alone, is not significant. However, the cumulative effect of regional growth, of which NIH is a part, can place excess demands on the current system capacity, especially during drought periods.

Regional solutions are being sought to augment the existing water supply over the next twenty years. Several alternatives are being considered.⁶

⁴The specific sediment control ordinance is found in Chapter 19 of the Montgomery County Code, "Sediment Control," 1972.

⁵The County and the Soil Conservation Service are considering increasing the storm water regulations to either a 10-year/10-year control basis and even possibly a 10-year/2-year control requirement. (This would mean controlling the difference between a 10-year storm given development and a 2-year storm prior to development.) NIH will comply with all regulations in effect. In addition, the County is reviewing its storm water retention policies to consider the importance of variable retention rates depending on the location of the tributary, to minimize flooding throughout the watershed of Rock Creek. (e.g. downstream tributaries should be cleared rapidly to allow the upstream flows from storms.)

⁶Both WSSC and the Army Corps of Engineers are studying the regional water supply situation. The Corps study, entitled the North Eastern Water Storage Study (NEWS), is not expected to be completed for another 2 to 3 years. Alternatives other than upstream dams are being considered. These include pump storage projects such as the Catoctin Creek Project in Loudoun County, Virginia.

Two schemes have received funds for design plans. These are for dams at Sixes Bridge (6 days flow upstream) and the Verona Dam (21 days flow upstream). Construction is under way on the Bloomington Dam, in West Virginia (28 days flow upstream). The Bloomington Dam will add an additional 137 mgd when it is completed in 1981. Other potential projects cannot be expected to provide any relief until the late 1980's. To the extent that these and other measures under consideration are implemented before full development at NIH is complete, there will not be a significant impact on the environment.

Further, NIH is very concerned about reducing the rate of water consumption on-site. Some of the means to reduce consumption are: installation of self-closing fixtures, lower water pressure heads, decrease the number of fixtures, and use of portable vacuum pumps. Programs are currently underway at NIH to investigate means to reclaim water and decrease basic consumption.⁷ NIH also conducts environmental, energy and utility studies before any project design is finalized. Plans have been initiated at NIH for conversion of existing fixture units with water saving devices on a reservation-wide basis. Thus, with the completion of the only scheduled project prior to 1980 (The Lister Hill Center), water consumption will be below current levels.

Sanitary Sewer System. - The increase in sanitary sewage with full development at NIH could generate a significant impact even though NIH would be within its contracted flow with WSSC. Plans are currently being studied by WSSC, Maryland and several federal agencies which will provide a solution to this region-wide problem. The potential for a significant impact arises only if these proposed plans for increasing treatment capacity are delayed.

The advanced water treatment (AWT) facility at Dickerson, Maryland is farthest along in planning and is scheduled to be in operation by 1981. This facility, which would be capable of treating 60 million gallons daily (mgd), would solve both the existing line and capacity problems. With construction of the Dickerson facility, the Blue Plains treatment capacity would be adequate for projected area demand. However, recent opposition to this facility may delay or prevent its construction. Other solutions have

⁷An example is the current study of feasibility and means to recover cooling tower discharges.

been suggested such as expanding facilities on Piscataway Bay in southern Prince George's County. Until additional sewage treatment capacity is provided for the regional system, the existing moratorium would not be lifted.

As long as the moratorium is in effect, NIH would have to obtain a special approval from the state, county and WSSC to add sewer connections. Any approval requires NIH to comply with all applicable provisions in effect at the time of the filing. As stated in the previous section, NIH is initiating a Reservation-wide water saving program. This will result in an estimated reduction in sewage flow in the range of 25,000 to 30,000 gpd.⁸

In addition, paper bags and boxes are replacing the use of GI cans for waste transport. This eliminates the can washing function and, by actual measurement, will reduce sewage flow by 5,470 gpd. Thus, even with the full operation of the only facility projected for completion before 1980, a net saving of about 25,000 gpd in sewage is anticipated due to the water saving programs.

⁸Correspondence between Leon M. Schwartz, Associate Director for Administration, HEW, and James P. Gleason, Montgomery County Executive, July 31, 1975.

SOLID WASTE

Probable Environmental Impact

Common Refuse. - At current generation rates, full development on the Reservation would add about 9 tons daily to the generation of common refuse for a total of 34 tons daily (Table 12). If the generation of refuse continues to increase at the current rate, the total could be as high as 45 tons daily.

TABLE 12 GENERATION OF COMMON REFUSE FOR NEW PROJECTS
(Tons)

| <u>Use</u> | <u>Employees</u> | <u>Tons</u> <u>Estimated</u> | <u>% of</u> <u>New</u> | <u>% of</u> <u>Total</u> |
|---|------------------|---------------------------------|---------------------------|-----------------------------|
| Total New Projects | 4,080 | 11.0 | 100 | 32 |
| Current Generation | | 25.0 | | 74 |
| (Less buildings removed) | | -2.0 | | - 6 |
| Total estimated generation at Full Development (based on current usage rates) | | 34.0 | | 100 |

Note: a. Includes 800 outpatients/day

b. Includes 500 visitors/day

Source: Dalton·Dalton·Little·Newport, 1975.

Medical/Pathological Wastes. - Medical/pathological wastes (MPW) will increase by about 1-1/2 tons daily with full development.¹ The total projected MPW wastes will be about 5-1/2 tons daily at current rates of generation. If the average increases in daily generation continue, the total could be as high as 7 to 8 tons daily in 1985. The new projects at NIH would represent an added 20 percent to the amount generated

¹Applicable standards with respect to disposing of Medical/Pathological wastes include:

WSSC Standards of Discharge into Sanitary Sewers.

Land Disposal and Thermal Processing Regulations of

EPA. (P. L 91-512 and 93-14) as presented in F.R. 39, 158, Part III, August 14, 1974.

NIH Manual Issuance 3032, on Infectious and Animal Wastes.

in the county. With the expansion of other public and private hospitals in the County, the total NIH share of the county MPW is expected to decline.

Current collection and disposal systems are sufficiently stringent to prevent any external contamination. NIH is currently working on improving the tagging, packaging, and transport procedures which will further improve the safety and efficiency of the system.

NIH uses a large quantity of single-use products in its research and patient care activities. There is no current program to reduce the use of these products. The single-use items provide added security in preventing potential contamination, which is particularly important in biomedical research.

Significance

Common Refuse. - The County is developing an innovative energy and recycling facility which is critical to the solution of the County solid waste problems. By the time any major project proposed in the NIH development plan is complete, the County system should be in operation.

If for some reason the County plan experiences major delays, the added generation of solid wastes at NIH could produce a significant impact because of the limited land fill available in the area. Under these circumstances NIH would have to consider alternative means to dispose of its solid waste.

Medical/Pathological Wastes. - Full development will increase the generation of medical/pathological wastes at NIH by about 40 percent. With the installation of the new NIH medical/pathological waste incinerator, NIH will have the capability to handle all of the projected NIH generation of these wastes. In addition, if the County MPW facility is completed, the NIH incinerator will act as a backup unit. Thus, there will be no significant impact generated by the increase in medical/pathological wastes.

HOUSING RESOURCES

With full development, there will be an increase of about 2,000 new households to the Washington area. The effect on housing resources will be centered in Montgomery County where 55 to 60 percent of the new employees are expected to reside. The regional demand for housing will increase by a maximum of 2,600 units for full development, with total demand near 8,600 units. This represents approximately 4.8 percent of the housing in Montgomery County.

Addition of over 4,000 employees will have an effect on housing in Montgomery County, particularly in the area of moderate income housing. A number of elements tend to lessen the overall impact on housing resources:

- About half of the employees will seek housing outside the county, dispersing the impact throughout the region.
- The inception of Metro will broaden the choice of residential areas for NIH employees, especially those with moderate incomes.
- A major percentage of the moderate income employees will probably have working spouses, thus creating a higher total family income level.
- Many lower income workers will be in the region already, rather than new residents of the region, thus lessening the demand created for additional low and moderate income housing.
- Current county efforts to increase the stock of moderately priced dwelling units.
- Housing coordination services at NIH.

MAINTENANCE SYSTEMS

Since most of the basic services required by NIH, such as police and fire protection, are provided on-site, there will be no added demand for these services from Montgomery County. With modest increases, on-site services will be sufficient to handle demands created by additional development. The predominant impact will center on education and recreation services in those areas where employees reside.

The added population at NIH will generate an increase in the demand for public school spaces by about 1,550 students. The effect on Montgomery County schools would total about 900 added students at full development.¹ This addition represents less than .7 percent of the total enrollment in county schools.

The school system can more easily accommodate the increase in student population in the southern portion of Montgomery County since there is excess capacity in the existing facilities. Schools are operating near capacity in the northern portions of Montgomery County.

The extent to which the new employees locate in the lower part of the county near NIH will have a positive effect on the school system, which has experienced a sharp decline in school populations over the last five years.

Impact on general public services and recreation will also focus on living location of added employees. In the vicinity of the site, the impact will be very small because it is a mature residential area which will not experience major growth. The areas in the county where increased services will be demanded are those growth oriented portions of the county. Because of the dispersion of the living locations expected, the impact will be diffused. For Montgomery County as a whole, the increased demand from the added NIH population would represent about one-half of one percent increase in demand.

¹Based on living location data which indicates that about 57 percent of NIH employees reside in Montgomery County.

THE TRANSPORTATION SYSTEM

Probable Environmental Effects

Traffic. - An increase in vehicle trip generation is one of the major effects associated with the proposed development at NIH. The increase in both on-site and off-site volumes must be examined. With full development, the total peak hour trips generated by NIH are estimated at 4,500 in 1990. This is less than a 5 percent (200 trips) increase over the current peak hour trips generated by NIH, but represents a 40 percent increase over 1990 conditions without development (Table 13).

TABLE 13 NIH AUTO TRIP GENERATION 1975-1990

| | <u>1975</u> | <u>1990</u> |
|----------------------|-------------|-------------|
| Existing Development | 4,300 | 3,200 |
| New Projects | - | 1,300 |
| | <hr/> | <hr/> |
| TOTAL | 4,300 | 4,500 |

Source: Dalton·Dalton·Little·Newport, 1975.

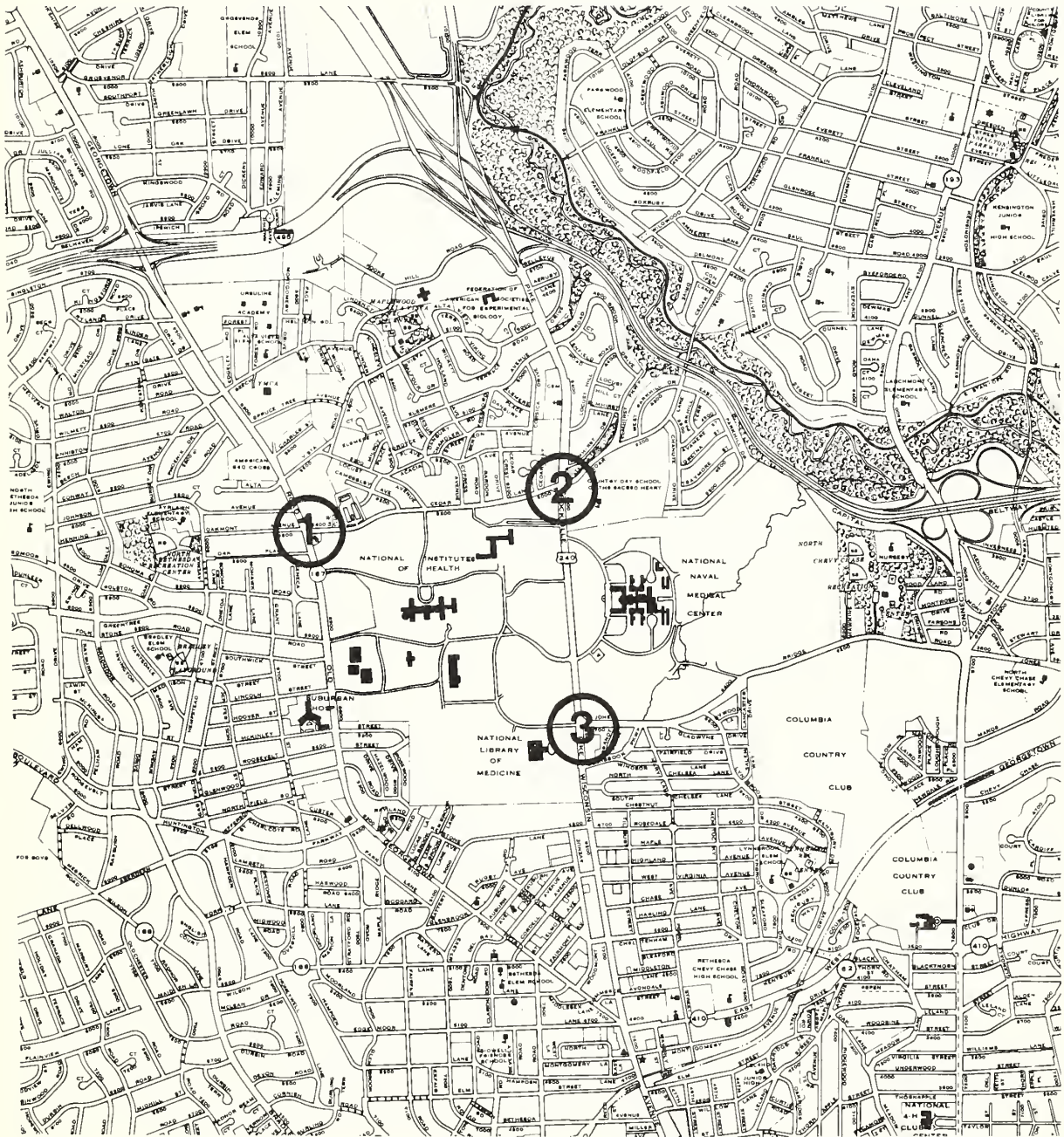
Surrounding roadways are currently operating at unsatisfactory service levels during the peak hour, thus any additional traffic will compound an already congested situation. Map 7 shows the major roads surrounding the site and the major traffic generators in the area, including NIH, the National Naval Medical Center, the Uniformed Services University of the Health Sciences (USUHS) and Suburban Hospital.

Externally generated traffic is expected to increase far in excess of that generated by NIH.¹ Thus, as shown in Figure 7, even with full development NIH's percentage of peak hour intersection volumes will drop (28% to 23%).

The major factor in reducing the full development traffic impact is construction of the Metro Rapid Transit System and an expanded feeder bus system. In January 1980, the Metro

¹In the vicinity of NIH, major new development is currently taking place including a major addition to the National Naval Medical Center and construction of the Uniformed Services University of the Health Sciences. The projected traffic volumes from these facilities have been taken into account in this analysis.

MAP 7 SITE AREA MAP - MAJOR ROADS

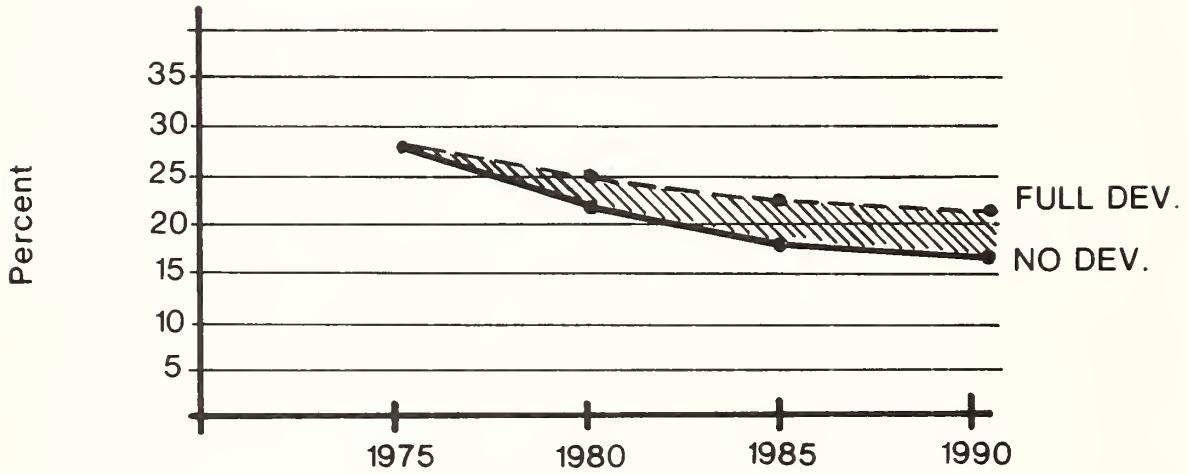


KEY INTERSECTIONS

- 1 Cedar Lane/Old Georgetown Rd.
- 2 Cedar Lane/Rockville Pike
- 3 Rockville Pike/Jones Bridge Rd.



FIGURE 7 NIH AS A PERCENT OF THE TOTAL VOLUME AT KEY INTERSECTIONS



Note: Assumes 50% plan implementation by 1980 and full development by 1990

Source: Dalton·Dalton·Little·Newport

Medical Center Station (located on the grounds of NIH) is scheduled to be in operation. Approximately 21 percent of NIH employees are expected to use mass transit (including feeder bus service) by 1985 (Table 14). Car pooling is also expected to increase in the future. It is projected that the car occupancy rate will increase from 1.25 to 1.40 by 1990.

TABLE 14 PROJECTED NIH MODAL SPLIT (1980-1990)

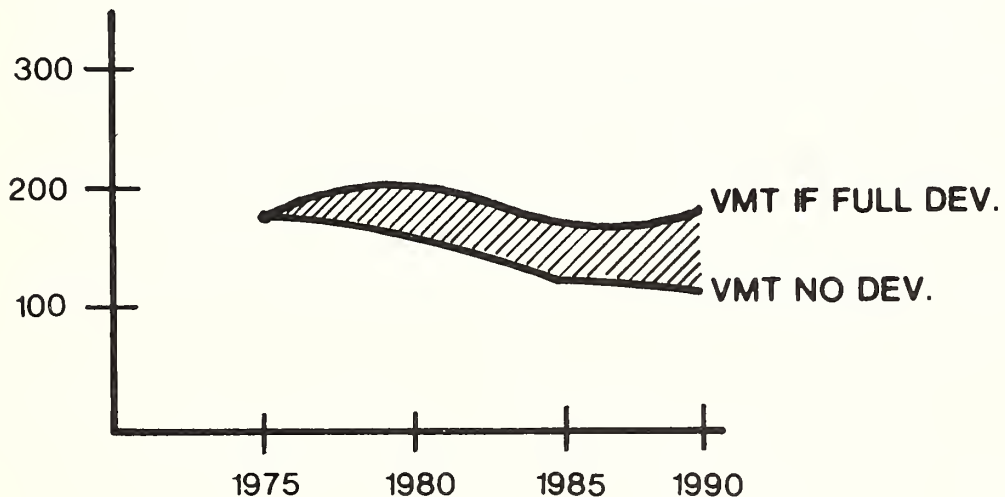
| 1980 | | 1985-1990 | |
|--------------------|-----|--------------------|-----|
| <u>Modal Split</u> | | <u>Modal Split</u> | |
| Auto: | 90% | Auto: | 76% |
| Public transit: | 7% | Public transit: | 21% |
| Walk and other: | 3% | Walk and other: | 3% |

Source: Dalton·Dalton·Little·Newport, 1975.

To arrive at an average mass transit use for NIH employees, the estimated mass transit use (both bus and rail) was calculated for each of the major living areas of NIH employees. Information from the Metro Net Income Analysis (1971) was also used in the determination of these usage rates.

Figure 8 shows the projected impact of full development on vehicle miles traveled (VMT). VMT represents the total auto miles traveled for all NIH employees driving to and from work each day.² As public transit usage and car occupancy rates increase, VMT will decline. Without further development, it is projected that VMT will fall from 165,000 miles daily to 121,000 miles in 1990. If full development were achieved in 1990, daily VMT would be approximately 178,000 or about 8 percent higher than 1975.

FIGURE 8 IMPACT OF FULL DEVELOPMENT ON VMT



Source: Dalton·Dalton·Little·Newport

²The average work trip distance for NIH employees is approximately 21 miles, round trip.

Circulation. - A significant redevelopment of the internal circulation system is planned.

The proposed circulation system is composed of an inner loop around the central core of the site. The access roads on the east, north, and west of the site will link into this inner loop. South drive will be closed to all but bus traffic when the Metro station is complete and one of the parking lot entrances off Cedar Lane will also be closed when MPL 4 is built and these surface lots are removed (Map 8).

The new loop system is designed to make it less attractive to use the site roads as "cut throughs," improve the internal movement of traffic, allow increased open areas in the core and increase the amount of open space. Adequacy of the proposed system will depend on the location and configuration of the proposed MLPs.

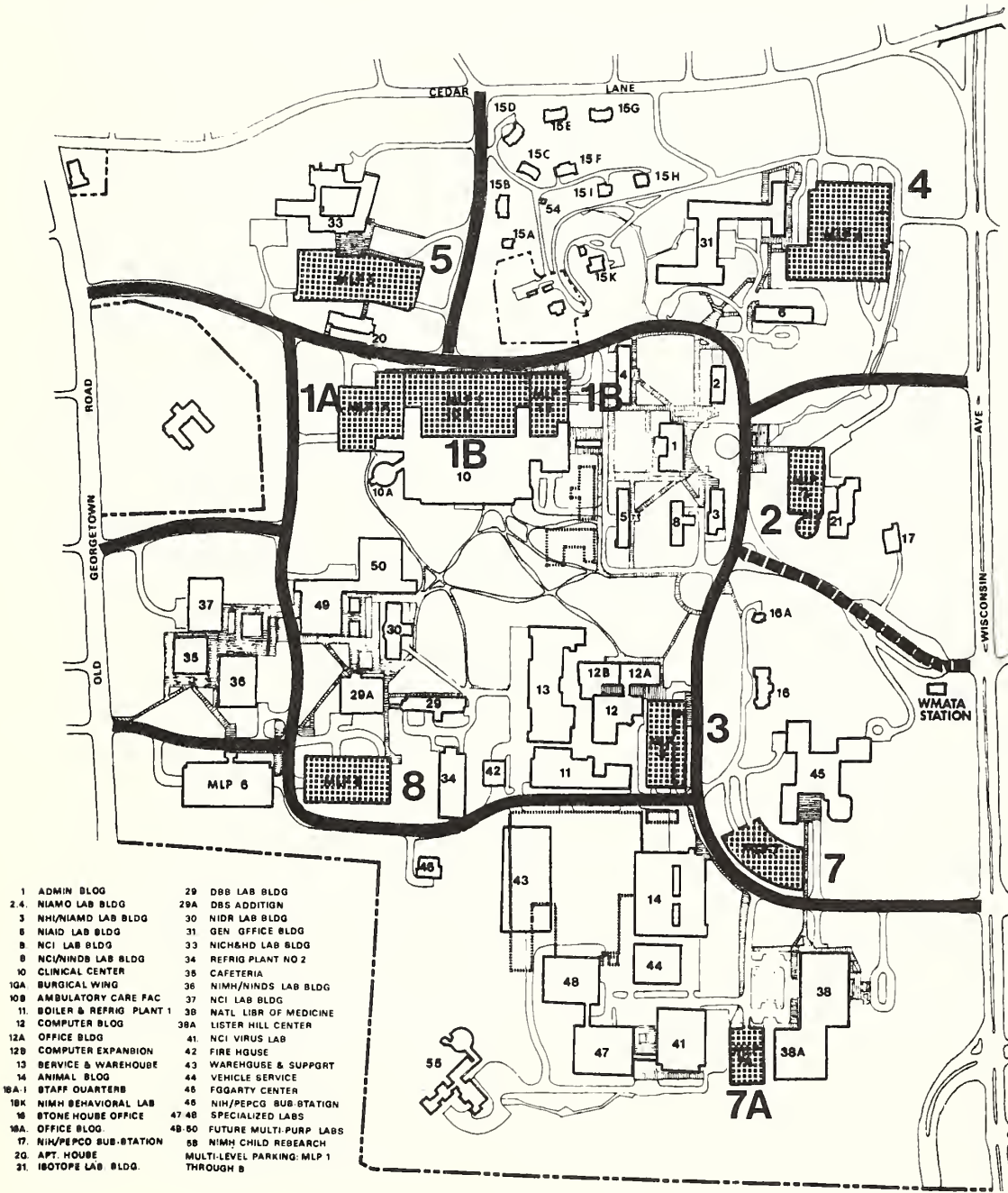
The proposed parking will be concentrated in these strategically located MLPs and is designed to intercept automobiles as they enter central areas of the Reservation. The MLPs, with a total of 7,550 spaces, will replace almost all parking which is currently located in surface lots. Combined with the 813 spaces in MLP-6, already constructed, and the surface parking which will remain, maximum on-site parking would total approximately 9,000 spaces--about a 2,000 space increase over current parking spaces.

Less than half of the MLPs are actually programmed for construction prior to the operation of Metro service. Thus, changes can readily be made in plans for MLP construction. As a result, the parking proposals of the 1972 Master Plan and the programming of each individual MLP will be subject to review and revision.³

Changes in the proposed circulation system will also cause a general shift in the entry point utilization pattern. Potential trouble spots include: Wilson Drive and Center Drive on Rockville Pike and Lincoln Drive on Old Georgetown Road where entering/exiting volumes are expected to be especially high with some "queuing" problems anticipated during the evening peak hour.

³In addition to internal review and revision, the National Capital Planning Commission (NCPC) must also review and approve individual MLP's.

MAP 8 PROPOSED CIRCULATION & MLP LOCATIONS



- | | |
|----------------------------|------------------------------|
| 1 ADMIN BLDG | 29 DBB LAB BLDG |
| 2,4 NIAMD LAB BLDG | 29A DBS ADDITIGN |
| 3 NIAM/NIAMD LAB BLDG | 30 NIDR LAB BLDG |
| 8 NIAD LAB BLDG | 31 GEN OFFICE BLDG |
| 8 NCI LAB BLDG | 33 NICH&ND LAB BLDG |
| 8 NCI/NINDS LAB BLDG | 34 REFRIG PLANT NO 2 |
| 10 CLINICAL CENTER | 35 CAFETERIA |
| 10A SURGICAL WING | 36 NIMH/NINDS LAB BLDG |
| 10B AMBULATORY CARE FAC | 37 NCI LAB BLDG |
| 11 BOILER & REFRIG PLANT 1 | 38 NATL LIBR OF MEDICINE |
| 12 COMPUTER BLDG | 38A LISTER HILL CENTER |
| 12A OFFICE BLDG | 41 NCI VIRUS LAB |
| 12B COMPUTER EXPANSION | 42 FIRE HQUSE |
| 13 SERVICE & WAREHOUSE | 43 WAREHOUSE & SUPPORT |
| 14 ANIMAL BLDG | 44 VEHICLE SERVICE |
| 15A.1 STAFF QUARTERS | 45 FOGARTY CENTER |
| 16 NIMH BEHAVIORAL LAB | 46 NIH/PEPCO SUB STATION |
| 16A STONE HOUSE OFFICE | 47,48 SPECIALIZED LABS |
| 16A. OFFICE BLDG. | 48,50 FUTURE MULTI-PURP LABS |
| 17 NIH/PEPCO SUB-STATION | 58 NIMH CHILDR RESEARCH |
| 20 APT. HOUSE | MULTI-LEVEL PARKING: MLP 1 |
| 21 ISOTOPE LAB BLDG. | THROUGH B |

0 100 300 600 1000
SCALE IN FEET



■■■■■ Buses Only
5 MLP Number

Significance

The increase in auto trips generated by NIH personnel will not have a significant effect on the natural environment.⁴ There will, however, be important social effects resulting from an increase in vehicle trips.

With full development, 1,300 additional trips will be diffused over the four major approach directions to the Bethesda Reservations.⁵ The net effect will be increase "queuing" and thus waiting time at the intersections during peak-hour. Except for the addition of one lane on Cedar Lane east of Rockville Pike, no plans exist to alleviate congestion at any of the intersections.

Current projections include a program that would stimulate increased car occupancy and mass transit usage. The effect of mass transit and car pooling will be to lessen the impact of the added development--only 200 peak-hour trips over the current level of generation. If the increased car pooling and mass transit usage did not take place, total trips generated would be over 6,000 at peak hour. With these programs, however, the total peak hour trips is projected to be 4,500 (less than 5 percent over 1975 levels).

There are two types of actions which NIH could undertake to reduce traffic impacts. These include:

- Efforts to lower peak hour arrival
- Efforts to lower vehicle trips.

Lower Peak-Hour Arrival. - The existing peak hour arrival rate is approximately 53 percent. If this figure were lowered to 40 percent, peak hour trips would be reduced by about 1,000. The only feasible way of lowering peak hour trips is to stagger work hours. Peak-hour arrival is currently quite low because of the character of the professional research staff work needs.

⁴See sections on Air Quality and the Level of Sound.

⁵The increase over 1990 no development level is 1,300 trips; and the increase over existing levels (1975) is 200 trips.

Lower Vehicle Trips. - This is probably the most effective way of reducing the traffic impacts generated by increasing NIH employment. Vehicle trips may be reduced by increasing car occupancy rates or increasing mass transit use.

Policies to increase car occupancy rates include:

- Encourage car pooling by providing priority parking spaces.
- Institute an organized car pooling program (matching riders to living locations).
- Charge a fee for parking.
- Limit availability of parking.

All of these would tend to increase the attractiveness of mass transit usage by lowering the attractiveness of driving.

Policies to increase metro utilization include:

- Provide efficient shuttle bus service from Medical Center Station. The proposed loop circulation system would accommodate a small shuttle bus type service very well. With the internal loop approximately 1.4 miles long, two buses operating at 8 mph could provide service at 6 minute intervals to the Medical Center Station. A shuttle bus system would also help alleviate any zonal parking deficiencies, if they should develop.
- Post transit schedules and coordinate work hours with transit scheduling.
- Charge a fee for parking.
- Limit availability of parking and other actions that make driving less attractive.

THE COMMUNICATIONS SYSTEM

Two major changes will be made in the communication system with full development. First, a Centrex system will be installed between 1977 and 1978 which will increase the capacity, efficiency, and flexibility of telephones servicing the site.

Secondly, transmitting and receiving facilities are proposed for the Lister Hill Center as an experimental program to provide health care delivery and medical information/education to remote areas. A study conducted to determine whether this facility will interfere with local radio or TV frequencies indicates no interference will be generated.

The effects of full development on the communication systems is expected to be proportional to the increase in employment. With employment projected to increase by 43 percent over the baseline figure, the number of main stations should increase by roughly 2,500. This represents about 8.2 percent of the main stations currently operating in the Bethesda Wire Center and 1.3 percent of the main stations in Montgomery County. With full development, NIH would account for 27.8 percent of existing lines in the Bethesda Wire Center and 4.4 percent of main stations in Montgomery County.

The increased demand for phone service is not expected to have a significant impact on the provision of telephone service to the area according to the C & P Telephone Company.

BUSINESS AND ECONOMIC SYSTEMS

The proposed developments at NIH will generate an additional 4000 to 4500 jobs. This added employment will consist mainly of professional research personnel and technical support staff with annual incomes averaging higher than the current average on the Reservation. This added employment represents about 2.5 percent of total county employment. Thus, at full development NIH will account for slightly over 8 percent of total employment. Because of other growth, NIH's percentage of employment will remain constant or fall slightly.

The proposed projects will generate over \$100 million (1974 dollars) annually into the regional economy in both direct wages and indirect multiplier effects.¹ Thus, full development is projected to generate almost \$400 million annually in direct and indirect economic effects (Table 15). About \$200 to \$240 million annually will accrue to Montgomery County if current living patterns remain relatively constant. In addition, over \$200 million in construction will add to the economic impact on the county and region and the demand for skilled construction workers (Table 16).

TABLE 15 TOTAL DIRECT AND INDIRECT REGIONAL ECONOMIC IMPACT OF FULL DEVELOPMENT
(Millions)

| | <u>Direct Effect</u> | <u>Indirect Effect</u> | <u>Total</u> |
|-------------------------------|----------------------|------------------------|----------------------|
| Wages/salaries | \$ 60 - \$ 65 | \$24 - \$ 40 | \$ 84 - \$105 |
| Other Expenditures | <u>\$ 10 - \$ 15</u> | <u>\$ 3 - \$ 7</u> | <u>\$ 13 - \$ 22</u> |
| Total New Projects | \$ 70 - \$ 80 | \$27 - \$ 47 | \$ 97 - \$127 |
| Total Current Expenditures | <u>\$184</u> | <u>\$70 - \$107</u> | <u>\$254 - \$291</u> |
| Total Full Development | \$254 - \$264 | \$97 - \$154 | \$351 - \$418 |

Source: Dalton·Dalton·Little·Newport, 1975.

¹The general magnitude of indirect economic effects is estimated by using a regional multiplier. Best estimates of the regional multiplier are 1.4 to 1.6 of income generated. The mid-point (1.5) is used (Bonner, 1968; Caffrey, 1971).

TABLE 16 REGIONAL ECONOMIC EFFECTS OF CONSTRUCTION EXPENDITURES (millions)

| | <u>Total^a Construction</u> | <u>Construction^b Wages</u> | <u>Man-Years^c (national)</u> |
|----------|---|---|---|
| Direct | \$ 200 | \$ 60 | 2,000 |
| Indirect | <u>\$ 40 - 60</u> | <u>\$20 - 30</u> | <u>8,000</u> |
| Total | \$240 - 260 | \$80 - 90 | 10,000 |

- Note: a. Multiplier 1.2 - 1.3
 b. Multiplier 1.4 - 1.6
 c. This is a national multiplier effect because of the dispersed economic effects associated with the materials equipment purchase.

Source: Dalton·Dalton·Little·Newport, 1975.

Impact on the business sector will be dispersed throughout the region because of the dispersion of employee living locations and the further dispersion of federal nonwage expenditures. There will be added demands on the local hotel and restaurant business with the conference and meeting facilities planned for the Lister Hill Center and the Fogarty International Center.

GOVERNMENT FINANCIAL SYSTEM

At full employment levels, NIH employees will directly produce 5 to 6 percent of county taxes, with a total regional impact from direct and indirect sources of \$28 to \$37 million annually.¹

Taxes generated by the additional employment will account for roughly 2.5 percent of current local taxes (local taxes equalled \$220.3 million in 1973) with the aggregate impact of full development representing about 8.4 percent of current local taxes when direct and indirect sources are totaled.² This represents an increase of approximately 39 percent over the existing situation.

HISTORIC RESOURCES

There is no physical or visual relationship between the NIH Reservation and any historic sites in the area.³

¹Direct generation of taxes by employees is based on an average income of \$15,700 and thus an average local tax burden of \$1,490 annually (1974 dollars).

²The general magnitude of indirect taxes generated by NIH employees is estimated by using a regional multiplier. Best estimates of the regional multiplier are 1.4 to 1.6 of income generated. The mid-point (1.5) is used (Bonner, 1968; Caffrey, 1971).

³In addition to listings of the National Register of Historic Places, contacts were also made with the Maryland Historical Trust, the Maryland National Capital Park and Planning Commission and the Montgomery County Historic Society concerning the presence of historic sites in the area.

FULL DEVELOPMENT AFTER 2000

This alternative examines the environmental impact of a slower rate of physical development on the Bethesda Reservation with full development occurring after the year 2000. Implicit in this alternative is the assumption that growth in biomedical research will be slower, funding will be delayed or policy decisions will favor other locations for research activities.

The probable effects of full development after 2000 will be analyzed to the extent that they differ from the primary alternative. Each system will be addressed individually. The overall implication of the "year 2000" alternative is that, while the level or magnitude of impacts in the year 2000 will be similar to full development impacts in 1990, the intensity of the impacts will be lessened during the years of partial development.

NATURAL SYSTEMS

Land Use

There are no significant differences in effects between full development in 1990 or full development in 2000.

Land and Waters

With delayed implementation of the full development plan, the rate at which surface parking areas are removed will decrease. Thus, storm water run-off will also decrease at a slower rate.

Air Quality

To the extent that traffic volumes are reduced for a longer period of time, auto emissions will be reduced. Thus, there would be a marginal improvement in air quality during the intervening years of partial development.

The Level of Sound

There are no significant differences in effects between full development in 1990 or full development in 2000.

POPULATIONS

Plant and Animal Populations

There are no significant differences in effects between full development in 1990 or full development in 2000.

Human Populations

Growth in on-site employment will occur at a slower rate. The indirect effects of increased populations are discussed in their relevant sections such as transportation, housing, and water/sewer systems.

TECHNOLOGICAL SYSTEMS

Energy

The new projects and their associated employees will increase energy consumption by about 23 percent. By slowing the rate of implementation of the full development plan, the rate of increase in energy consumption will be reduced.

Water and Sewer Systems

A slower rate of development on the Reservation may have an effect on both the water distribution and the sanitary sewer system. Capacity constraints are present in both systems. Relief for the regional water supply system is not likely to occur until the mid-to-late 1980's, while increased capacity in the sanitary sewage treatment system will not take place until 1980, at the earliest. Thus, delayed implementation of the full development plan will allow more time for solutions to be implemented in these technological support systems.

Solid Waste Systems

A slower rate of development on the Reservation may also have an effect on the solid waste system. Montgomery County is very short of landfill areas and is currently developing an innovative energy recovery and recycling facility. Once the county system is in operation, the 32 percent increase in common refuse generated by NIH at full development will be easily accommodated.

With either the completion of the new MPW incinerator at NIH or the planned county facility, the projected increase in medical/pathological wastes will not be a problem.

Housing Resources

There is a very "tight" housing supply in the Washington area. Thus, if expansion at NIH occurs over a longer period of time, there will be a better opportunity for the local community and the region to absorb the population increase.

Maintenance Systems

There are no significant differences in effects between full development in 1990 or full development in 2000.

The Transportation System

If expansion at NIH occurs over a longer period of time, the effects on the transportation system will be lessened. Slower implementation of the full development plan will allow the new Metro system to become established prior to a significant increase in on-site employment. With a high level of peak-period congestion existing in the vicinity of the site, a major portion of NIH employees will likely choose to ride mass transit and thus reduce NIH's contribution to vehicular congestion around the site. However, if implementation of the parking and internal circulation system is delayed, the effects associated with an inefficient circulation system will continue.

Communications Systems

There are no significant differences in effects between full development in 1990 or full development in 2000.

Business and Economic System

The impact of increased expenditures from construction and the new resident population will be spread over an additional ten-year time period.

Government Financial System

There are no significant differences in effects between full development in 1990 or full development in 2000.

HISTORIC RESOURCES

There are no differences in effects between full development in 1990 or full development in 2000.

NO ACTION

The no action alternative assumes that no further physical development will take place on the Bethesda Reservation. Implicit in this alternative is that there will be no increase in biomedical research at the Bethesda Reservation.

If no further development takes place on the Reservation, the magnitude and intensity of the existing environmental effects will tend to decrease over time. Many actions are currently being taken in the region to relieve the capacity problems in the technological support systems. For instance, a new advanced waste water treatment facility may be completed by the early 1980's and relieve the serious capacity restraints currently experienced in the regional sewer system. Metro, the new regional rail transit system, will be completed in the early 1980's and will supply service directly to the NIH Reservation. Montgomery County, which is rapidly running out of sanitary land-fill area, is developing an innovative energy and metal recovery facility. When completed, this facility will be able to recycle the large quantities of common refuse generated in the County.

Thus, the general environmental implications of the no action alternative are that the intensity of impacts generated by the existing level of employment and development on-site will tend to decrease as the local community and region implement new programs to accommodate the environmental effects of urban growth.

NATURAL SYSTEMS

Land-use

There will be no change generated in area land use patterns.

Land and Waters

To the extent that surface parking remains on-site, storm water run-off would remain at its present level.

Air Quality

Air quality will tend to improve in two areas:

- Auto Emissions
- Boiler Emissions.

While air quality would improve even with full development on the Reservation (due to more stringent emission standards), the degree of improvement would be greatest with no further development on site. (See Figures 1 through 6 on page 39 for a specific comparison of emissions.)

In addition, there will be no effects from construction and demolition operations with the no action alternative.

The Level of Sound

With an increase in mass transit ridership, there will be a decrease in vehicle trips generated by NIH employees. Thus, a minor (barely perceptible) reduction in on-site traffic noise will occur.

With no further development on-site, there will be no construction related noise.

TECHNOLOGICAL SYSTEMS

Energy Systems

Energy conservation is a major concern at NIH. It is anticipated that programs which reduce energy consumption will continue to be implemented. In addition, with increased mass transit ridership, vehicle miles traveled will decrease with a resultant decrease in fuel consumption.

Water and Sewer Systems

NIH is implementing a water conservation program which will significantly reduce the water usage on the Reservation and thus the waste water discharge. With no further development on the Reservation, NIH's effect on the sanitary sewer system will decline. (The estimated reduction in sewage flow will be in the range of 25,000 to 30,000 gpd.)

Solid Waste

There will be no change in the generation of solid wastes.

Housing Resources

There will be no change in effects with respect to the provision or demand for housing.

Maintenance Systems

There will be no change in effects with respect to maintenance systems.

The Transportation System

With no further development on the Reservation, NIH's traffic impact on the surrounding road system will gradually decline. It is projected that, with the new Metro system in operation and some restrictions on parking availability, peak hour vehicle trips will decline by 25 percent in 1990 (4,300 to 3,200). This is a positive impact because peak-hour congestion is a problem in the vicinity of the site.

With the no action alternative, redevelopment of the internal circulation system would not occur. Thus, the inconveniences associated with the existing on-site circulation system would continue.

Communications Systems

There will be no change in effects with respect to the communications systems.

Business and Economic Systems

Full development at NIH is projected to directly generate over 3,000 jobs and over \$250 million in wages and expenditures. Indirect economic effects would add an additional \$100 to \$150 million. In addition, over \$200 million in construction expenditures would also be added to the regional economy. Thus, if there were no further development at NIH, these effects will not occur.

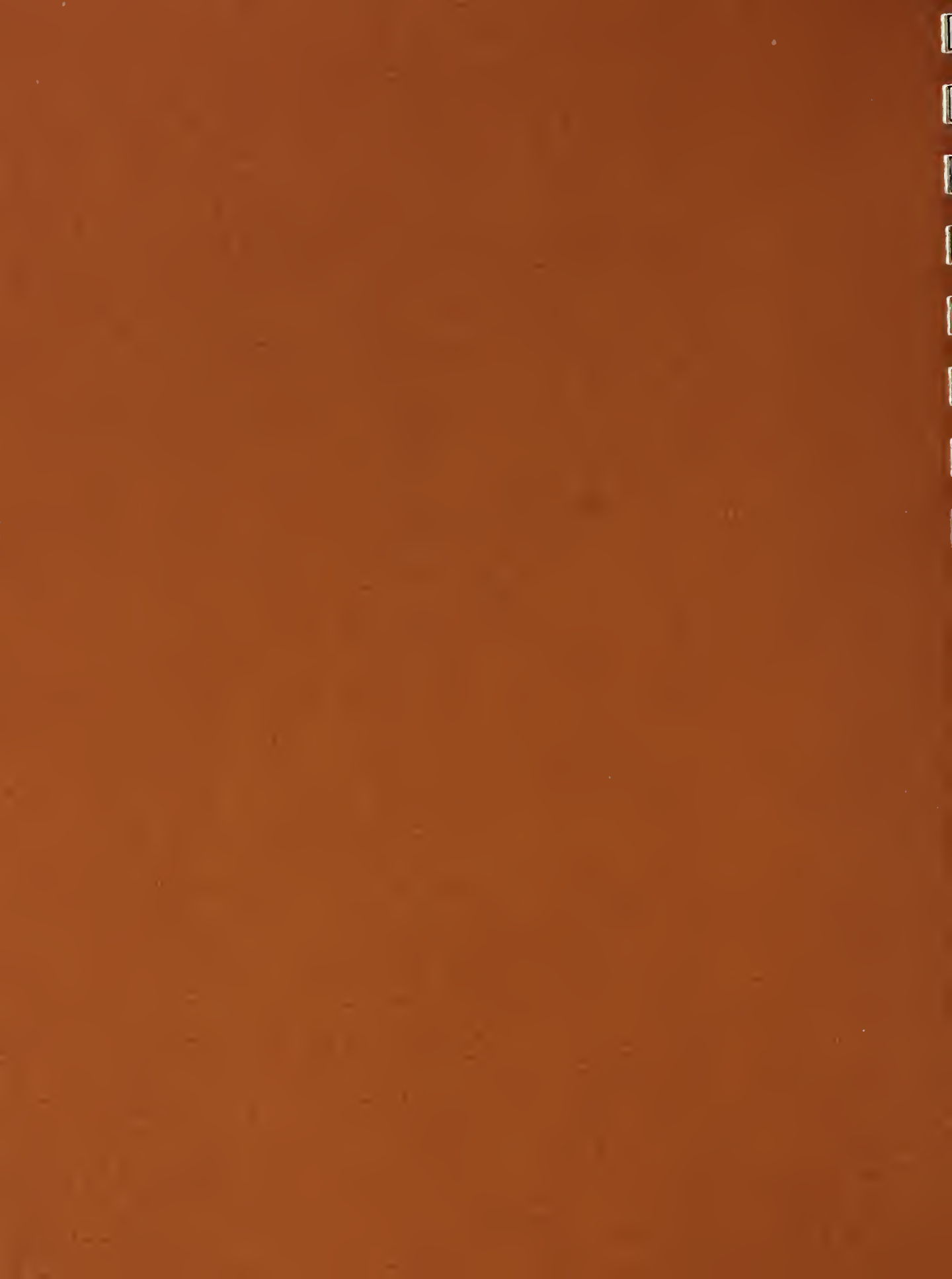
Government Financial

At full development levels, the total regional impact on the local government financial system would be approximately \$28 to \$37 million annually in revenues/expenditures. Thus, if employment levels remain constant at NIH, these effects would not occur.

HISTORIC RESOURCES

There would be no change in effects with respect to historic resources.

VI. AGENCY COMMENTS





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

June 18, 1976

Mr. R. R. Holliday
Director, Division of
Engineering Services
National Institute of Health
9000 Rockville Pike
Bethesda, Maryland 20014

Re: Revised Master Plan for Bethesda Reservation;
National Institute of Health, Bethesda, Maryland

Dear Mr. Holliday:

We have reviewed the draft Environmental Impact Statement and the accompanying Environmental Analysis received June 14, 1976 for the above proposed action. We have classified it as ER-1 in EPA's reference category and you will find enclosed a copy of the Definition of Codes for the General Nature of EPA Comments to provide you with a more detailed description of this rating.

While we wish to commend the general scope, detail, and clarity of the statement's presentation of the project and its potential environmental effects we note the potential for significant air quality impacts that should be addressed and mitigated in further development of the project. Our concerns about potential impacts on air quality and other aspects of the draft statement's presentation are outlined below.

Air Quality

The draft statement indicates (and specifies on page 67 of the Environmental Analysis) high eight-hour levels of carbon monoxide (CO) concentration which even exceed standards at one point on the Rockville Pike. As the proposed plan includes added traffic due to employment population growth at the site, it is important that CO impacts on local air quality be adequately quantified and measures are taken to minimize project-related impacts.

①

In addressing the environmental aspects of a comprehensive plan for expansion of a complex of facilities many uncertainties about specific design and scheduling details (which would be prerequisite to a precise analysis of microscale air quality impacts) do not exist. Consequently, it may not be possible or productive for the final statement to quantify impact with much greater accuracy than is shown in the draft statement and Environmental Analysis.

On the other hand, the understandable lack of detail in the air quality analysis due to the early stage of project development does not preclude the sponsor's obligation to use mitigating measures in further development to minimize negative environmental impacts and insure that standards will not be exceeded due to the project. As further detail in project planning and design evolves, traffic and air quality analysis in correspondingly greater detail should be performed and appropriate mitigating measures should be implemented where found to be necessary. These analyses should be based on "worst case" procedures with a combination of most conservative traffic, meteorological, and emission assumptions to identify traffic congestion "hot spots" and quantify CO levels at "worst case" receptors. A broad range of possible mitigation measures should be considered, including (but not necessarily limited to) mass transit incentive/parking disincentive programs, TOPIC's-type roadway improvements in traffic congestion points (through ongoing coordination with appropriate highway agencies), reduced overall parking programs, "flexitime" work scheduling and increased bikeways and bicycle parking facilities for intra-site travel.

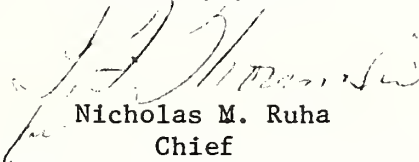
While further detailed air quality analysis does not appear to be necessary at this time, the final statement should include a commitment by the sponsor for ongoing analysis of air quality impacts to accompany further development of the project components of the plan, especially in design of parking facilities. This commitment should also show the sponsor's intent to explore, evaluate and utilize appropriate measures in planning, design, and/or operation to minimize negative impacts on air quality.

Noise Impacts

2 While we wish to comment the clarity of the presentation of potential noise impacts in the draft statement we would note that the nature of the site's activities may involve especially sensitive receptors of noise in areas where noise impacts may occur. We would advise, therefore, that prior to initiating any activities with potentially high noise levels a microscale survey of noise receptors be performed to determine the need for noise abatement procedures either at the source or the receptor.

We hope this review will assist you in the preparation of the final Environmental Impact Statement. We would appreciate a copy of the final statement at such time as it is filed with the Council on Environmental Quality, as well as copies of future environmental assessments performed in further development of this project. If you have questions or if we can be of further assistance you may wish to contact Mr. Sam Little of my office directly at 215-597-7093.

Sincerely yours,



Nicholas M. Ruha
Chief

EIS and Wetlands Review Section

Enclosure



NATIONAL CAPITAL PLANNING COMMISSION

1325 G Street, N.W.
Washington, D. C. 20576



In Reply Refer To:
NCPC File No. MP02

June 11, 1976

Mr. R. R. Holliday, Director
Division of Engineering Services
National Institutes of Health
9000 Rockville Pike
Bethesda, Maryland 20014

Re: Draft Environmental Impact Statement on the Revised
Master Plan, Bethesda Reservation, National Institutes
of Health, Bethesda, Maryland

Dear Mr. Holliday:

We are in receipt of the Draft Environmental Impact Statement referenced above on which the Commission's review and comments have been requested.

The Draft has been reviewed and evaluated in terms of its impact on Federal lands and interests in the National Capital Region, and its consistency with established Federal policies and Commission policies and plans for the National Capital Region. In addition, the Draft has been specifically reviewed in terms of its consistency with the National Institutes of Health (NIH), Bethesda Reservation, Master Plan which was approved by the Commission on December 7, 1972.

We offer the following comments for your consideration and clarification in preparation of the Final Environmental Impact Statement.

1. Environmental Effects of Proposed Alternatives, page 33

① In discussing the probable effects of full development of the NIH Bethesda Reservation, the Draft EIS states that "(t)he projects represent an increase of about 1.8 million square feet to the Reservation's total of 3.8 million square feet." However, on page 2, the Draft advises that full development of the Reservation would represent the "net addition of 32% (1.2 million square feet of floor area) to a total of about 5 million square feet."

The Final Statement should either explain the difference between the numbers representing floor area increase at full development, or revise the document to reflect the one correct number.

2. Water and Sanitary Waste Systems, page 60

The Draft acknowledges that NIH's increased sanitary sewage flows could generate a significant impact even though it would be within contracted flows with WSSC.

In view of recent opposition to the Montgomery County Advanced Wastewater Treatment (AWT) Facility at Dickerson, Maryland, specifically that expressed by the Environmental Protection Agency, which may delay or prevent its construction, the Final should discuss more thoroughly the impact of increase in NIH's sanitary sewage flows if there are further delays in the provision of additional AWT capacity in the Potomac Basin. (2)

Additionally, the Final should discuss satisfactory mitigation measures and/or alternatives which may alleviate or significantly reduce these impacts and which would not significantly disrupt the Reservation's biomedical research and operation.

3. Solid Waste Systems, page 63

The Draft advises that in the event of a delay in Montgomery County's energy and recycling facility, the "added generation of solid wastes at NIH could produce a significant impact because of the limited land fill available in the area." (3)

The Final Statement should discuss alternative means of disposing of the solid waste generated at NIH, if the County's facility is delayed, so as to avoid any significant environmental impacts.

4. Transportation Systems, page 68

The Commission in its approval of the 1972 Revised Master Plan for NIH excepted the proposed total amount of 9,000 off-street parking spaces subject to further review by the Commission, and recommended that currently programmed and/or approved parking structures be constructed as soon as possible.

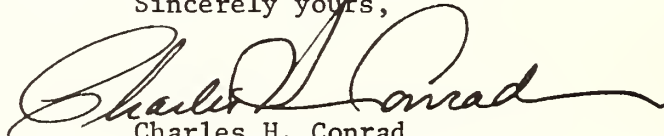
The Draft stipulates that only one-half of the proposed eight parking structures would be programmed by the completion of Metro to NIH in the early 1980's and proposes a maximum of 9,000 spaces at full development. Depending upon the impact of Metro, it is possible that the parking program could change. However, it has yet to be determined whether the projected total of 21% of NIH's employees expected to use Metro would significantly alter the proposed parking program.

In view of the above and the Commission's December 7, 1972, action on the Master Plan, we request that the following points be addressed in the Final:

- ④
- a. More explicit consideration should be given to alternative programs that would reduce the number of parking spaces proposed;
 - b. Discuss how the impacts would vary with reduced levels of parking;
 - c. Indicate more explicitly NIH's intentions with respect to effecting policies that would lower peak hour arrivals and total vehicle trips, in connection with a lower parking program for the installation.

We appreciate the opportunity to comment on the Draft Statement.

Sincerely yours,



Charles H. Conrad
Executive Director

Advisory Council
On Historic Preservation

1522 K Street N.W.
Washington, D.C. 20005

May 14, 1976

Mr. Charles Custard, Director
Office of Environmental Affairs
Department of Health, Education,
and Welfare
Washington, D.C. 20201

Dear Mr. Custard:

This is in response to your request of April 29, 1976 for comments on the environmental statement for the Revised Master Plan Bethesda Reservation, National Institutes of Health, Bethesda, Maryland. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your draft environmental statement appears adequate regarding our area of expertise and we have no further comment to make.

Should you have any questions or require any additional assistance, please contact Ellen R. Ramsey of the Advisory Council staff.

Sincerely yours,

John D. McDermott
Director, Office of Review
and Compliance

CC: FLO-HEW

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE - 4321 Hartwick Rd., Rm. 522

College Park, Maryland 20740

May 17, 1976

Mr. Charles Custard, Director
Office of Environmental Affairs
Room 4740
330 Independence Avenue, S.W.
Washington, D. C. 20201

Dear Mr. Custard:

This is in response to your letter dated April 29, 1976, to the Office of the Secretary, U. S. Department of Agriculture, Soil Conservation Service, Washington, D. C. regarding the draft environmental impact statement for the "Revised Master Plan, Bethesda Reservation, National Institutes of Health", located in Montgomery County, Maryland.

Our area of interest in this project is erosion and sediment control both during construction and operation of this Plan, as well as provisions for storm water management. Your discussions on these subjects in the draft is sufficient for the final statement.

Sincerely,

Graham T. Munkittrick

Graham T. Munkittrick
State Conservationist

cc: R. M. Davis, Administrator
Office of the Coord. of Envir. Quality Activities
Council on Environmental Quality (5 copies)

RECEIVED

MAY 17 1976

RECEIVED

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MAY 17 1976

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-94-





MARYLAND
DEPARTMENT OF STATE PLANNING

301 WEST PRESTON STREET
BALTIMORE, MARYLAND 21201
TELEPHONE: 301-383-2451

VLADIMIR A WAHBE
SECRETARY OF STATE PLANNING
MADELINE L. SCHUSTER
DEPUTY SECRETARY

MARVIN MANDEL
GOVERNOR

June 11, 1976

Mr. R. R. Holliday, Director
Division of Engineering Services
Department of Health, Education and Welfare
National Institutes of Health
Bethesda, Maryland 20014

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT REVIEW

Applicant: U.S. Public Health Service
Project: Draft EIS - Revised Master Plan for Bethesda
Reservation
State Clearinghouse Control Number: 76-5-1024
State Clearinghouse Contact: Warren D. Hodges (383-2467)

Dear Mr. Holliday:

The State Clearinghouse has reviewed the above Statement. In accordance with the procedures established by the Office of Management and Budget Circular A-95, the State Clearinghouse received comments from the following:

Department of Economic & Community Development, Department of Health and Mental Hygiene, Department of Natural Resources, State Highway Administration and our staff: indicated that the Statement appears to adequately address those areas of interest to their agencies. However, some agencies are continuing their evaluation of the project and if they have further comments, their response will be forwarded by separate letter.

Thank you for your attention to the A-95 review process and we look forward to continued cooperation with your agency.

Sincerely,

Vladimir Wahbe
Vladimir Wahbe

cc: Walter Scheiber
Edward Symes
Wm. Landis
Donald Noren
Paul McKee
Wm. Sprague



metropolitan washington
COUNCIL OF GOVERNMENTS
 1225 Connecticut Avenue, N.W., Washington, D. C. 20036 223-6800

A-95 METROPOLITAN CLEARINGHOUSE MEMORANDUM

DATE: June 2, 1976

TO: R.R. Holliday, Director
 Division of Engineering Services
 Dept. of HEW
 National Institutes of Health
 Bethesda, MD 20014

SUBJECT: PROJECT NOTIFICATION AND REVIEW FOR

PROJECT: Draft EIS on the Revised Master Plan COG NO.: 76-M-FI/EIS-3
 for the National Institutes of Health
 APPLICANT: National Institutes of Health

The project title, COG number, and the applicant's name should be used in all future correspondence with COG concerning this proposed project.

PLEASE NOTE ACTION INDICATED BY CHECK MARK IN BOX BELOW OR ON REVERSE

PROJECT NOTIFICATION

The item referenced above was received on _____ and has been referred to appropriate parties (see attached list) for their review and comment. This review will be conducted as expeditiously as possible.

A copy of the item referenced above is enclosed for your review and comment, in accordance with OMB Circular A-95 review requirements. Your review should focus on this item's compatibility with the plans, programs, and objectives of your organization. You may indicate below your interest in and/or comments concerning this item by returning this sheet to the Metropolitan Clearinghouse by _____.

This organization:

- _____ does not wish to comment on the above item.
- _____ has further interest and/or questions concerning the above item and wishes the Clearinghouse to set up a conference with the applicant.
- _____ is interested in the above item and wishes to make the following comments: (Use attachment)
- _____ will submit comments concerning the above item by _____.
- _____ desires an extension of time until _____ for further consideration of this item. (Subject to certain restraints imposed by the OMB Circular.)
- _____ has reviewed the item referenced above, finds it in conformance with our policies, and recommends a favorable Metropolitan Clearinghouse review.

Signature _____

Organization _____

ADDITIONAL INFORMATION

One or more of the reviewing organizations has questions about or interest in this item and wishes to confer with the applicant. A conference between the applicant and the interested parties has been scheduled for _____ at _____ in our offices. Please confirm whether you plan to attend this conference by calling not later than _____.

Please refer to the attached "Purpose of Conference" explanation sheet for additional information.

A Clearinghouse conference has been held on the item referenced above, and a summary of its proceedings is transmitted herewith for your information.

We have reviewed the item referenced above. Based on this review and the response from Clearinghouse referrals, we request

_____ Additional information as noted on the attached sheet;
_____ The opportunity to review the final application before it is submitted to the Federal agency.

FINAL DISPOSITION

We have concluded review of the item referenced above. We have determined as a result of this review that while the item may be of local significance, its nature does not warrant metropolitan comments. A copy of this memorandum and attachments should accompany your application to indicate the Metropolitan Clearinghouse review has been completed.

We have concluded review of the item referenced above. We have determined as a result of this review that the item is in general accord with the metropolitan planning process and the Council of Governments' adopted policies. A copy of this memorandum and attachments should accompany your application to indicate the Metropolitan Clearinghouse review has been completed.

We have concluded review of the item referenced above. The Council of Governments submits, herewith, the attached Metropolitan Clearinghouse Review Comments. A copy of this memorandum and the attached comments should accompany your application when submitted to the Federal agency to indicate the Metropolitan Clearinghouse review has been completed.



EXECUTIVE DIRECTOR

Correspondence concerning Metropolitan Clearinghouse review matters should be addressed to Mr. Walter A. Scheiber, Executive Director. The staff may be reached by telephone at 223-6800, ext. 311.

WE APPRECIATE YOUR COOPERATION

The Clearinghouse review comments will be valid for a period of two (2) years from the date of letter forwarding these comments to the applicant. All projects not submitted to the Federal funding agency within two (2) years of the date of the Clearinghouse review letter will be re-submitted to the Clearinghouse for update of the review comments before formal application is made to the Federal Government.



METROPOLITAN CLEARINGHOUSE REVIEW COMMENTS

COG PROJECT NUMBER: 76-M-FI/EIS-3

PROJECT NAME: Draft Environmental Impact Statement
on the Revised Master Plan for the
National Institutes of Health

FEDERAL AGENCY: U. S. Department of Health,
Education and Welfare,
Public Health Service

PROJECT DESCRIPTION:

The Public Health Service of the Department of Health, Education and Welfare proposes to implement its 1972 Revised Master Plan for the National Institutes of Health (NIH), located in Montgomery County, Maryland. Implementation of the Plan involves the following activities:

1. Ten new buildings to be constructed, including research-related patient care facilities, laboratories, an international conference center, a national center for biomedical communications, and various support and service facilities.
2. Removal of nine buildings, including laboratories, animal buildings and service facilities.
3. Creation of a loop system for traffic circulation.
4. Elimination of most of the present surface parking, to be replaced by a maximum of eight multi-level parking structures.
5. Redevelopment and expansion of the landscaping on the site.

At present, there are 10,500 employees located on the 306 acres which comprise the Bethesda Reservation of NIH. The Master Plan envisions a maximum expansion of the work force to 15,000 employees, or an increase of 41 percent.

Three alternatives were evaluated in the Draft EIS: (a) full development by the year 1990; (b) full development by the year 2000; and (c) no action. Other alternatives, such as full implementation of the development program earlier than 1990 or a major change in land uses on the site, were considered unreasonable and were not evaluated further.

Total cost for full implementation of the development program as outlined in the Revised Master Plan is estimated at \$200 million over a twenty-year period.

RELATIONSHIP TO THE METROPOLITAN PLANNING PROCESS AND THE ACHIEVEMENT OF AREAWIDE GOALS AND OBJECTIVES:

In the Draft EIS, full development by the year 1990 appears to be the preferred alternative, and therefore, this alternative has received the greatest attention in the environmental analysis. The most significant environmental impacts are expected to result from the additional employment on the Reservation.

Transportation

The Draft EIS indicates a conscientious effort to foster increased use of mass transit and a reduction in the impact of automobile traffic associated with this additional employment. The environmental analysis proposes a number of techniques to lower peak hour arrivals and vehicle trips, including greater usage of carpooling, more flexible work schedules, and possible charges for on-site parking.

The Revised Master Plan calls for increasing the present supply of parking to 9,000 spaces from its present level of 7,000 spaces. Of the new total, 7,550 spaces are to be in multi-level parking structures, compared with only 813 structure spaces at the present time. In the Draft EIS, it is recognized that, when Metrorail service becomes available to NIH in 1980, the need for additional parking may be decreased. It is suggested that the Final EIS address this issue in greater depth, to determine the extent to which limiting the availability of on-site parking for both existing and new employees will result in greater usage of the rapid transit system and increased carpooling.

The needs of employees arriving on foot and by bicycle has not been addressed in the Draft EIS. Although the number of these employees is recognized as a small percentage of the total, the Final EIS should give consideration to their needs, including access to the site and possible provision of secure bicycle storage facilities.

Water and Sewer Service

2 The Draft EIS does an adequate job of analyzing the primary impacts of increased employment at NIH on the sewage treatment and water supply requirements of the Washington Metropolitan Area. However, the addition of 2,000 new households to the area can be expected to create major secondary environmental impacts because of increased domestic water supply and sewage disposal needs. The Final EIS should address these secondary impacts, giving particular attention to their regional implications, and should also indicate how any adverse impacts might be mitigated.

While regional solutions are being sought to augment the existing water supply over the next twenty years, the Draft EIS is inaccurate in stating that funds for the design of the Sixes Bridge Dam have already been provided.

Housing and Educational Needs

The Draft EIS indicates that increasing the employment at NIH from 10,500 to 15,000 can be expected to add about 2,000 new households to the Washington area, with 55 to 60 percent of them likely to reside in Montgomery County. Of the 4,500 new employees, between 500 and 875 are expected to be in the moderate-income range. It is anticipated that most of these moderate-income employees will be existing residents of the region; however, the present lack of suitable housing in the Bethesda area means that these employees will have to live in other portions of the region.

In July 1971, the COG Board of Directors adopted a policy statement on the location of Federal work facilities in the National Capital Area which contained the following recommendation:

"The Federal government should provide special financial assistance and work with local jurisdictions to provide (1) adequate housing to enable the local governments to match the housing demands created in each jurisdiction by Federal job locations, and (2) special transportation services, and other supporting facilities and services, for employees who would otherwise be adversely affected by changes in Federal job locations."

3 The Final EIS should address the needs of moderate-income employees and their families for improved accessibility to jobs and increased opportunities for finding suitable housing which is within their means. In addition, the Final EIS should analyze the educational needs of the 2,000 new households and indicate how any adverse environmental impacts on the school systems of Montgomery County and other areas might be mitigated.

RECOMMENDATION:

It is recommended that the Land Use Policy Committee and the Water Resources Planning Board endorse these comments.

COMMITTEE ACTIONS:

The Land Use Policy Committee endorsed these comments on May 26, 1976. The Water Resources Planning Board endorsed these comments on May 27, 1976.



The Maryland Historical Trust

Shaw House, 21 State Circle, Annapolis, Maryland 21401
301: 267-1212 or 301: 267-1438

May 21, 1976

Mr. R. R. Holliday, Director
Division of Engineering Services
Department of Health, Education & Welfare
Public Health Service
National Institutes of Health
Bethesda, Maryland 20014

Dear Mr. Holliday:

I have reviewed the Revised Master Plan for the NIH expansion program, and find that it will not have any adverse impact on archaeological sites. The Maryland Historical Trust, therefore, finds the program consistent with its plans, programs, and objectives.

Sincerely,

Robert V. Riordan, Ph.D.
Staff Archaeologist

RVR/njm

cc: Colleen Vokroy
Dept. of Economic & Community Development



THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

8787 Georgia Avenue • Silver Spring, Maryland 20907

(301) 589-1480

June 7, 1976

Mr. R. R. Holliday, Director
Division of Engineering Services
National Institutes of Health
Bethesda, Maryland 20014

Dear Mr. Holliday:

I regret to inform you that we will not be able to submit to you our comments on "Environmental Analysis - National Institutes of Health Revised Master Plan - Bethesda Reservation" by June 14, 1976 as requested. A heavy work program does not allow us at this time to perform the thorough review that such a substantial document commands. We will, however, review the Environmental Analysis as soon as possible and submit our comments to you forthwith.

Thank you for your usual cooperation.

Sincerely yours,

A handwritten signature in cursive script that reads "Royce Hanson".

Royce Hanson
Chairman

CC: Mr. Charles Conrad

RH:LC:mc



Budget Office

MONTGOMERY COUNTY, MARYLAND

100 MARYLAND AVENUE, ROCKVILLE, MARYLAND 20850 • 301 279-1611

June 17, 1976

Mr. R. R. Holiday
Director
Division of Engineering Services
National Institutes of Health
9000 Rockville Pike
Bethesda, MD 20014

Dear Mr. Holiday:

Re: NIH Draft Environmental Impact Statement

Montgomery County has the NIH Draft EIS and is currently in the process of reviewing the three documents. This is a time consuming process since there are six county departments that must review the documents prior to any executive action. We hope to have our comments to you by July 9.

Cordially,

A handwritten signature in cursive script, appearing to read "William H. Hussmann".

William H. Hussmann
Chief Administrative Officer

SHM:WHH:ls

VII. RESPONSE TO AGENCY COMMENTS



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AGENCY COMMENTS WHICH DO NOT REQUIRE RESPONSES

Advisory Council on Historic Preservation
United States Department of Agriculture
 (Soil Conservation Service)
Maryland Department of State Planning
 (State I-95 Review Agency)
The Maryland Historical Trust
The Maryland-National Capital Park and Planning Commission
Montgomery County - County Executive Office

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comment 1 (Air Quality)

The draft statement indicates (and specifies on page 67 of the Environmental Analysis) high eight-hour levels of carbon monoxide (CO) concentration which even exceed standards at one point on the Rockville Pike. As the proposed plan includes added traffic due to employment population growth at the site, it is important that CO impacts on local air quality be adequately quantified and measures are taken to minimize project-related impacts.

NIH Response

Careful consideration of air quality implications are required in the environmental review process by HEW and by The National Capital Planning Commission for each project as it is developed. Further, HEW procedures require an environmental reassessment every three years for continuing individual actions on which an EIS was issued.

As with this analysis, "worst case" procedures and the latest assumptions on emissions will be used. The air-monitoring station on site allows ongoing review of general ambient conditions on the Reservation. At full development, the DEIS indicated improving air quality in the vicinity of the site and compliance with standards even at the worst traffic locations. NIH is committed to developing programs to increase car occupancy rates, stimulate mass transit use, and support area agency efforts for special bus programs and bike path development. (For further detail, see NCPC comment #4.)

The very localized air quality impacts around and in the parking structures have been and will continue to be taken into consideration for access and queuing problems at entry points, internal structural characteristics, mechanical systems, and facility siting. The proposed parking, circulation, and landscaping plans were designed to minimize auto travel time and queuing problems, to encourage walking, and to provide bikeways and storage facilities.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comment 2 (Noise Impacts)

While we wish to commend the clarity of the presentation of potential noise impacts in the draft statement, we would note that the nature of the site's activities may involve especially sensitive receptors of noise in areas where noise impacts may occur. We would advise, therefore, that prior to initiating any activities with potentially high noise levels, a microscale survey of noise receptors be performed to determine the need for noise abatement procedures either at the source or the receptor.

NIH Response

Many of NIH's research programs are sensitive to noise and vibration. According to regular procedure, NIH consults extensively with personnel involved with research projects which are potentially affected. An example is the survey and consultations associated with the possible vibration impacts from tunnel blasting for Metro. As a result of this preliminary work involving carefully defined procedures and monitoring, no disruption or impacts to ongoing activities have resulted from the blasting.

NATIONAL CAPITAL PLANNING COMMISSION

Comment 1 (Development Plan - Square Footage)

In discussing the probable effects of full development of the NIH Bethesda Reservation, the Draft EIS states that "the projects represent an increase of about 1.8 million square feet to the Reservation's total of 3.8 million square feet." However, on page 2, the Draft advises that full development of the Reservation would represent the "net addition of 32% (1.2 million square feet of floor area) to a total of about 5 million square feet."

The Final Statement should either explain the difference between the numbers representing floor area increase at full development, or revise the document to reflect the one correct number.

NIH Response

Both are correct:

| | <u>Net Square Feet</u> (Millions) |
|------------------------------|--------------------------------------|
| Estimated addition | 1.8 |
| Estimated deletions | <u>.6</u> |
| Net additions | 1.2 |
| Current | <u>3.8</u> |
| Expected at full development | 5.0 |

NATIONAL CAPITAL PLANNING COMMISSION

Comment 2 (Water and Sanitary Waste Systems)

The Draft acknowledges that NIH's increased sanitary sewage flows could generate a significant impact even though it would be within contracted flows with WSSC.

In view of recent opposition to the Montgomery County Advanced Wastewater Treatment (AWT) Facility at Dickerson, Maryland, specifically that expressed by the Environmental Protection Agency, which may delay or prevent its construction, the Final should discuss more thoroughly the impact of increase in NIH's sanitary sewage flows if there are further delays in the provision of additional AWT capacity in the Potomac Basin.

Additionally, the Final should discuss satisfactory mitigation measures and/or alternatives which may alleviate or significantly reduce these impacts and which would not significantly disrupt the Reservation's biomedical research and operation.

NIH Response

Currently, there is a great deal of uncertainty about the nature and timing of a solution to the sewage treatment capacity problems in the area. In assessing the probable impact of NIH on the sanitary sewage system, four important points must be considered:

1. Some area-wide restraints will remain in effect until a regional solution is reached.
2. There is some limited capacity remaining in the current system (Franklin R. Day; Project Manager, Dickerson AWT; WSSC; June, 1976).
3. Most of NIH's proposed development will occur after 1980.
4. NIH must go through a rigorous approval process with the State, Montgomery County, and WSSC before additional flows will be permitted. Two key elements determine that approval: Demonstrated efforts to cut water consumption, and evaluation of the public priority for the remaining available capacity.

It is acknowledged that at some point additional water conservation efforts cannot be made and remaining capacity may not exist. At this point should a major construction project for expansion of bio-medical research be necessitated before a solution is implemented, a hook-up to the regional sanitary sewage system would be unlikely. This could cause a disruption to the development of NIH's bio-medical research program. In such a situation, there are three options open to NIH at the Bethesda Reservation utilizing: temporary existing off-site facilities, underground holding tanks, or a small on-site treatment facility.

Temporary off-site space in existing facilities could be used. These would be either private leased space or accommodations at other Federal installations. Space availability and the specific character of the research program would determine the applicability of this alternative.

On-site sewage storage tanks would allow containment of waste water during peak daily generation hours and permit discharge at a time when the overall demand on the system is lowest. The tanks can be placed underground even under a structure such as a parking garage. This has been done elsewhere and is relatively easy and inexpensive. While this approach does not solve the treatment capacity problem, it would alleviate the Rock Creek interceptor capacity problem. This line capacity problem is currently the major direct constraint on NIH increasing sewage.

Creating an on-site advanced treatment facility is a more expensive alternative which would require careful environmental consideration of effluent characteristics and sludge disposal methods. Generally, the EPA has not favored the proliferation of these types of small treatment facilities in large urban areas. Some of the considerations are:

1. A proper location must be found.
2. There are tested "package" plants available. If one were properly run and monitored, it could deal with the basic sewage. Special consideration would have to be given to the implication of the portion of special wastes which do enter the sewage system from NIH facilities.
3. Treated effluent discharge would require very careful prior evaluation and testing to insure no adverse impacts on water quality or flows.

Since the problem of the area treatment capacity is unresolved and NIH's development plan is long-term, these alternatives have not been evaluated in detail. As soon as

a regional direction is determined, NIH will be in a position to more accurately plan its response as individual projects move to implementation.

Each individual project requires an environmental determination to comply with HEW and NCPC procedures, and as long as restraints are in effect, it will require an "exception," NIH must prove the implementation of water savings programs and/or prove a priority need on the remaining available capacity.

NATIONAL CAPITAL PLANNING COMMISSION

Comment 3 (Solid Waste Systems)

The Draft advises that in the event of a delay in Montgomery County's energy and recycling facility, the "added generation of solid wastes at NIH could produce a significant impact because of the limited land fill available in the area."

The Final Statement should discuss alternative means of disposing of the solid waste generated at NIH, if the County's facility is delayed, so as to avoid any significant environmental impacts.

NIH Response

The County presently handles about 1,200 tons of solid waste daily. All of the common refuse is disposed in the County's sanitary landfill area. By mid-1977, this area will be full and a new landfill area will have to be used. The County recently acquired a new landfill site which will be capable of handling all of the County's common refuse disposal through 1980. A search is currently underway for a landfill site which will be able to handle the County's disposal needs after 1980.

Thus, the County is not relying solely on the development of the new energy and recycling facility. The earliest date the recycling facility could be put into operation is mid-1979. Consultants are now examining the economic feasibility of constructing and operating the facility. It is projected that it will be capable of recycling or reusing approximately 96% of the County's common refuse.

The problem is a regional one which must be addressed regionally. NIH, at full development, will generate less than 2% of the County's common refuse. While NIH views the collection of common refuse as a municipal service and is assuming the County will continue to provide this service, there are several alternatives which NIH would consider in the event of a breakdown in this service.

1. Build an on-site common refuse incinerator. This would be a substantial investment and require careful environmental evaluation.
2. Convert steam generation to refuse fired facilities. This is not considered economical for less than 50-75 tons per day.

3. Attempt to reactivate the Tri-Services incinerator concept only for common refuse in conjunction with the Army and Navy.
4. Haul refuse to another federal installation (25-50 miles for disposal. Transportation issues would require careful evaluation.
5. Employ on-site compaction to extend life of County land fills. This would be expensive and of marginal short-run value.
6. Continue current recycling efforts of NIH. Based on NIH's experience, a major expansion in the recycling effort would be costly and inefficient.
7. Reduce the generation of solid waste. The developing trend in medical and research facilities is to use products only once in order to maintain sanitary conditions. Any program in this area would have to evaluate the trade off in added water demand, energy consumption, safety, resource use, and waste generation.

NATIONAL CAPITAL PLANNING COMMISSION

Comment 4 (Transportation)

We request that the following points be addressed in the Final:

- a. More explicit consideration should be given to alternative programs that would reduce the number of parking spaces proposed;
- b. Discuss how the impacts would vary with reduced levels of parking;
- c. Indicate more explicitly NIH's intentions with respect to effecting policies that would lower peak hour arrivals and total vehicle trips, in connection with a lower parking program for the installation.

NIH Response

A detailed evaluation of alternative policies to decrease car use is included in the Environmental Analysis (Vol. II, pages 312-354). The DEIS states the program elements under consideration by NIH.

Programs to increase car pooling, limit parking, and stimulate mass transit use are highly interdependent. NIH is committed to a program to lower car utilization and has initiated preliminary programs in this direction prior to the completion of Metro.

1. "Green" Parking Permits for intra-campus employee trips have been eliminated.
2. The first stage in the program is being developed now and involves priority parking for car poolers. Following this, other programs will be implemented.
3. The first four proposed parking structures are primarily replacement of surface lots and not new spaces. This will allow NIH to implement its new circulation plan with improved bicycle and pedestrian systems.

The parking program at NIH is a balance between efforts to decrease car use and to provide an adequate level of parking for real need. NIH is aware that there is a close relationship between the availability of on-site parking and the

success of Metro and car-pooling programs. However, the effects of an overly restrictive parking program must also be examined. These include:

1. Increased driving time to find spaces and thus added air pollution.
2. Increased residential street parking.
3. Creating an enforcement problem.
4. Placing undue restraints on visitors and out-patients.

NIH is committed to a flexible program in parking space development. NIH will take a very careful look at parking requirements as car utilization rates fall due to Metro and as the NIH program is implemented to increase Metro use and car pooling. Even the maximum 9,000 proposed spaces force the employee parking ratio down from over 60% to about 50%.

Further, a detailed analysis of alternative parking levels was conducted in the Environmental Analysis (Vol. II, pages 350-354). Four alternatives were evaluated from the proposed maximum of 9,000 spaces down to the NCPC 3-1 limit of 6,150 spaces. The Environmental Analysis estimates the need for 8,000 spaces (46% employee/space ratio) based on the projected results of an effective program to lower car use (1.4 car occupancy rate, 76% car utilization rate). Parking levels for the alternatives below 8,000 (Maintenance of current spaces - 6,950 and the NCPC 3-1 ratio - 6,150 spaces) would require a combination of actions which do not seem reasonable at this time:

1. 6,950 spaces would require some combination between a 1.4 car occupancy rate (COR) with 40% mass transit use (MTU) and 1.8 COR with a 21% MTU.
2. 6,150 spaces would require a combination between 1.4 COR with 50% MTU and 2.1 COR and 21% MTU.

NIH will work with NCPC in defining the most appropriate programs to stimulate mass transit use to increase car pooling, and to minimize required parking.

Separate from the issue of lower car use, are efforts to lower peak hour congestion in the area of the site. NIH would support selected County programs to increase intersection capacity in the area. Also, efforts to increase

the already staggered employee work hours will continue. There are, however, two factors which will limit the expansion of staggered hours at NIH.

1. Already one-half of the employees arrive and leave at non-peak hours.
2. There is currently a reasonable distribution of peak hour traffic through and to the area. NNMC has earlier work hours than NIH and arterial traffic is spread equally heavily through the full a.m. and p.m. peaks.

WASHINGTON D.C. COUNCIL OF GOVERNMENTS

Comment 1 (Transportation)

It is suggested that the Final EIS address this issue in greater depth, to determine the extent to which limiting the availability of on-site parking for both existing and new employees will result in greater usage of the rapid transit system and increased carpooling.

The needs of employees arriving on foot and by bicycle has not been addressed in the Draft EIS. Although the number of these employees is recognized as a small percentage of the total, the Final EIS should give consideration to their needs, including access to the site and possible provision of secure bicycle storage facilities.

NIH Response

(See NCPC Comment 4.)

The in-depth environmental assessment that formed the base for the DEIS did consider pedestrian and bicycle users. The circulation and landscaping plans for the Master Plan have included major improvement and expansion in the pedestrian system and bike paths. Both access to the site as well as internal movement are considered. Further, NIH will cooperate with Maryland National Capital Park and Planning Commission in their efforts to develop a county-wide bike trail system.

WASHINGTON D.C. COUNCIL OF GOVERNMENTS

Comment 2 (Water and Sewer Service)

The Draft EIS does an adequate job of analyzing the primary impacts of increased employment at NIH on the sewage treatment and water supply requirements of the Washington Metropolitan Area. However, the addition of 2,000 new households to the area can be expected to create major secondary environmental impacts because of increased domestic water supply and sewage disposal needs. The Final EIS should address these secondary impacts, giving particular attention to their regional implications, and should also indicate how any adverse impacts might be mitigated.

While regional solutions are being sought to augment the existing water supply over the next twenty years, the Draft EIS is inaccurate in stating that funds for the design of the Sixes Bridge Dam have already been provided.

NIH Response

The Environmental Analysis did consider indirect effect of added households in a number of areas but did not adequately cover your excellent point on added sewage generation from new households.

Assuming between 300-400 gpd per household unit, these new households would generate added water demand between 600,000 gpd and 800,000 gpd at full development after 1990. Between 50-60% would be generated in Montgomery County and the remainder would be dispersed throughout the region if current employee living trends continue. Most of the additions in Montgomery County would have to be generated in the northern part of the County because the southern part is almost fully developed.

The impact of this added water demand and waste water generation is linked closely to the solution of the regional water supply and waste treatment capacity problems. (See NCPC comment 2.) To the extent that restrictions are in effect, additional housing in the County will be limited, forcing a change in the current housing pattern of NIH employees to other areas, further dispersing the generation of demand.

Finally, the full impact of the added households will not be felt until 1990-2000. There will be a gradual increase over the next twenty years with a very small annual increment. By that time regional solutions to both the water

supply and waste treatment capacity problems should be implemented.

NIH misinterpreted the information it received on the proposed Sixes Bridges Dam. Studies are currently taking place on the dam but design has not been funded.

WASHINGTON D.C. COUNCIL OF GOVERNMENTS

Comment 3 (Housing and Educational Needs)

The Final EIS should address the needs of moderate-income employees and their families for improved accessibility to jobs and increased opportunities for finding suitable housing which is within their means. In addition, the Final EIS should analyze the educational needs of the 2,000 new households and indicate how any adverse environmental impacts on the school systems of Montgomery County and other areas might be mitigated.

NIH Response

The detailed Environmental Analysis and the DEIS did address the needs of moderate income employees. (DEIS page 64; EA Vol. 2, pages 262-271). As stated in the DEIS there are a number of factors which will influence reasonable time and cost access to housing opportunities for moderate income employees.

1. The expanded Metro mass transit system will provide a significant improvement in access to the site for moderate income employees from major areas in the District where moderate priced housing is available.
2. Montgomery County is making an effort to expand moderately priced housing (projecting 1700 units between 1975-1980).
3. NIH has a housing office which offers assistance to employees looking for housing. This would be expanded specifically to help moderate income and low income employees.
4. Many of the families in this category will have multiple incomes. The Environmental Analysis estimated that over one-half of the employees in these categories will have second incomes. This will allow these employees a broader range of housing choices.

Educational System impacts are covered in the DEIS (page 65) and in detail in the Environmental Analysis (pages 276-284). It is expected that after 1990, at full development, NIH

will add about 880 students to the Montgomery County System and a slightly smaller number dispersed throughout the region. This represents less than 1% of Montgomery County's enrollment. To the extent that the new families live in the lower part of the County, they will help counter a decreasing enrollment situation which has forced the closing of a number of schools. NIH will add a small number of students to the currently tight school capacity in the upper part of the County if current living patterns are maintained. However, this addition will not take place until after 1980; and annual increments will be very small. By the time of full development after 1990, the capacity problems should be solved.

