



Managing the NIH Bethesda Campus's Capital Assets for Success in a Highly Competitive Global Biomedical Research Environment

The National Institutes of Health (NIH) is the primary agency of the United States government responsible for biomedical and public health research. It is one of 11 subcabinet agencies within the Department of Health and Human Services, with an annual budget of more than \$30 billion. Founded in the late 1870s, NIH has produced extraordinary advances in the treatment of common and rare diseases and leads the world in biomedical research. It is a critical national resource that plays an important role in supporting national security.

The NIH supports biomedical research through its Extramural Research Program (ERP), which funds researchers at universities and other institutions across the country, and through a highly productive Intramural Research Program (IRP) whose work is based primarily at the NIH's campus in Bethesda, Maryland. Approximately 90 percent of NIH's budget goes to support the ERP, with the remainder going to support the research and administrative activities carried out on the Bethesda campus.

The 310-acre Bethesda campus supports some 20,000 employees and contractors, and it contains more than 12 million square feet of facilities divided amongst nearly 100 buildings. These facilities include numerous and diverse types of laboratories, a 200-bed research hospital (the largest dedicated research hospital in the world), administrative space, and utilities. The Bethesda campus supports some of the most sophisticated and groundbreaking biomedical research in the world. However, while some new state-of-the-art buildings have been constructed in recent years, essential maintenance for many facilities and the campus overall has been consistently deferred for many years. The deteriorating condition of NIH's built environment is now putting its ability to fulfill its mission at substantial risk.

At the request of the NIH, the National Academies of Sciences, Engineering, and Medicine organized a study to identify the facilities in greatest need of repair on the Bethesda campus and evaluate cost estimates to determine what investment is needed for the NIH to successfully accomplish its mission going forward.

Over the course of nearly two years, the study committee—comprised of experts in facilities management, construction, biomedical research, and healthcare—reviewed the needs of the NIH built environment. They concluded that a substantial infusion of funding is needed to bring the Bethesda campus to a more functional level and that better processes for planning, building and maintaining its extensive facilities are also needed. If NIH is able to meet these challenges, the committee believes it can restore the foundation needed to continue its distinguished legacy of biomedical research.

CURRENT CONDITIONS AT NIH'S BETHESDA CAMPUS AND NEEDED INFRASTRUCTURE IMPROVEMENTS

The buildings and facilities at the NIH Bethesda campus are in need of significant upgrades in order to sustain their ongoing functionality. Seventy-two percent of the facilities are more than 20 years old and much of the supporting infrastructure is significantly older. While a number of individual facilities have been funded by Congressional appropriations for defined use over the past two decades, such funds have not addressed the overall campus needs.

The backlog of maintenance and repair (BMAR) for the Bethesda campus is at least \$1.3 billion and growing, an amount which cannot be met by the current yearly congressional appropriations for buildings and facilities (increased from \$150 to \$200 million in 2019). Without an immediate infusion of new funds, the BMAR will materially grow. New funds are critically needed to support NIH laboratories and bring all NIH facilities back to an acceptable standard, which will include work on power and water distribution, roof repair and leak mitigation, road and parking upgrades, and safety and security.

The committee recommends \$1.3 billion in new funding to replace and improve infrastructure serving current and future facilities and their associated science. This funding should be

implemented in two tranches. In the first allocation, \$700 million should be appropriated to fund long-term infrastructure improvements for the campus as a whole with the goal of spending these funds over a set time period (e.g., five years). Having the funds appropriated in one tranche is essential to support the staging and completion of projects in an orderly and logical manner. In the second tranche of \$600 million, each building should be considered for funding with priority given to buildings that most directly support NIH's scientific and medical goals.

The committee conducted site visits to numerous buildings on the Bethesda campus and identified Building 12 (used for high-performance computing), the Building 14/28 complex (the animal vivarium), and the parts of Building 10 occupied by the Clinical Center as facilities that should be considered as the highest priority for improvement or replacement.

IMPROVING FUTURE STRATEGIC PLANNING AND GOVERNANCE

Previous NIH-wide strategic plans have highlighted key research priorities, but have not addressed the ways in which research strategies depend upon specific facilities, space utilization policies, or capital investments. Therefore, the committee recommends the *NIH integrate its research strategic plan with its capital facility asset management plans; this should include developing a detailed 10-year plan for reducing the campus's backlog of maintenance and repair.* Further, the current NIH building and facilities prioritization model should be revised to give much higher weight to the facilities most critical to accomplishing NIH's mission.

Combining capital facilities financial planning with long-term research strategizing is an important function requiring subject matter expertise within central administrative leadership. Thus, the committee recommends that *NIH implement a capital facilities planning governance structure aimed at facilitating an integrated capital*

asset planning decision making process. NIH should consider how other federal agencies with research missions have assigned and empowered a senior organizational leader responsible for aligning their scientific mission and capital asset management plans.

Moving forward, NIH should also regularly interact with other federal agencies having extensive and mission critical research portfolios (e.g., NASA, USDA, NIST, and NRL, among others) to incorporate relevant best practices for prioritization, funding, and facilities management. Likewise, NIH should establish an external panel of biomedical research facilities management experts to review the integrated research strategic plan and capital asset plans.

NURTURING COLLABORATIVE AND INTERDISCIPLINARY RESEARCH

Over the past several decades, biomedical research has expanded beyond traditional distinct research fields into a highly transdisciplinary endeavor spanning biology, psychology, sociology, technology, and other areas of inquiry. This new model of convergence science and its collaborative ecosystem approach to research has critically important implications for the built environment at NIH. Thus, the committee recommends that NIH continue to prioritize collaboration among intramural research programs through shared space and flexible facilities to accommodate rapidly changing research strategies and needs.



North view of NIH's campus in Bethesda, Maryland.

COMMITTEE ON ASSESSING THE CAPITAL NEEDS OF THE NATIONAL INSTITUTES OF HEALTH: KENNETH W. KIZER, NAM, University of California, Davis, School of Medicine, *Chair*; EDWARD DENTON, University of California, Berkeley (retired); DON DETMER, NAM, University of Virginia School of Medicine; LAURA FIDLER, AMC Strategies, LLC; G. EDWARD (Edd) GIBSON, JR., Arizona State University; SANJIV GOKHALE, Vanderbilt University; MIKE HARBER, St. Jude Children’s Research Hospital; KERSTIN HILDEBRANDT-ABDIKARIM, Children’s National Health System; DOUG KINCAID, Applied Management Engineering, Inc.; THOMAS MITCHELL, FM3IS Associates, LLC; KIRK PAWLOWSKI, State of Washington Educational Service District 112; WILLIAM SEED, Jackson Health System; SARAH SLAUGHTER, NAE, Built Environment Coalition; PHIL TOBEY, SmithGroupJJR

STAFF: GREG EYRING, Senior Program Officer; MARTIN OFFUTT, Senior Program Officer; CAMERON OSKVIG, Board Director; JOSEPH PALMER, Senior Program Assistant

This Consensus Study Report Highlights was prepared by the Board on Infrastructure and the Constructed Environment (BICE) based on the report *Managing the NIH Bethesda Campus’s Capital Assets for Success in a Highly Competitive Global Biomedical Research Environment* (2019). The study was sponsored by the National Institutes of Health. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of the sponsors. Download the report at nap.edu/25483.

Division on Engineering and Physical Sciences

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

The nation turns to the National Academies of Sciences, Engineering, and Medicine for independent, objective advice on issues that affect people’s lives worldwide.

www.national-academies.org