

# *A 10-Year Strategic Infrastructure Plan to Deliver the Full Potential of Brookhaven National Laboratory*

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**BROOKHAVEN**  
NATIONAL LABORATORY

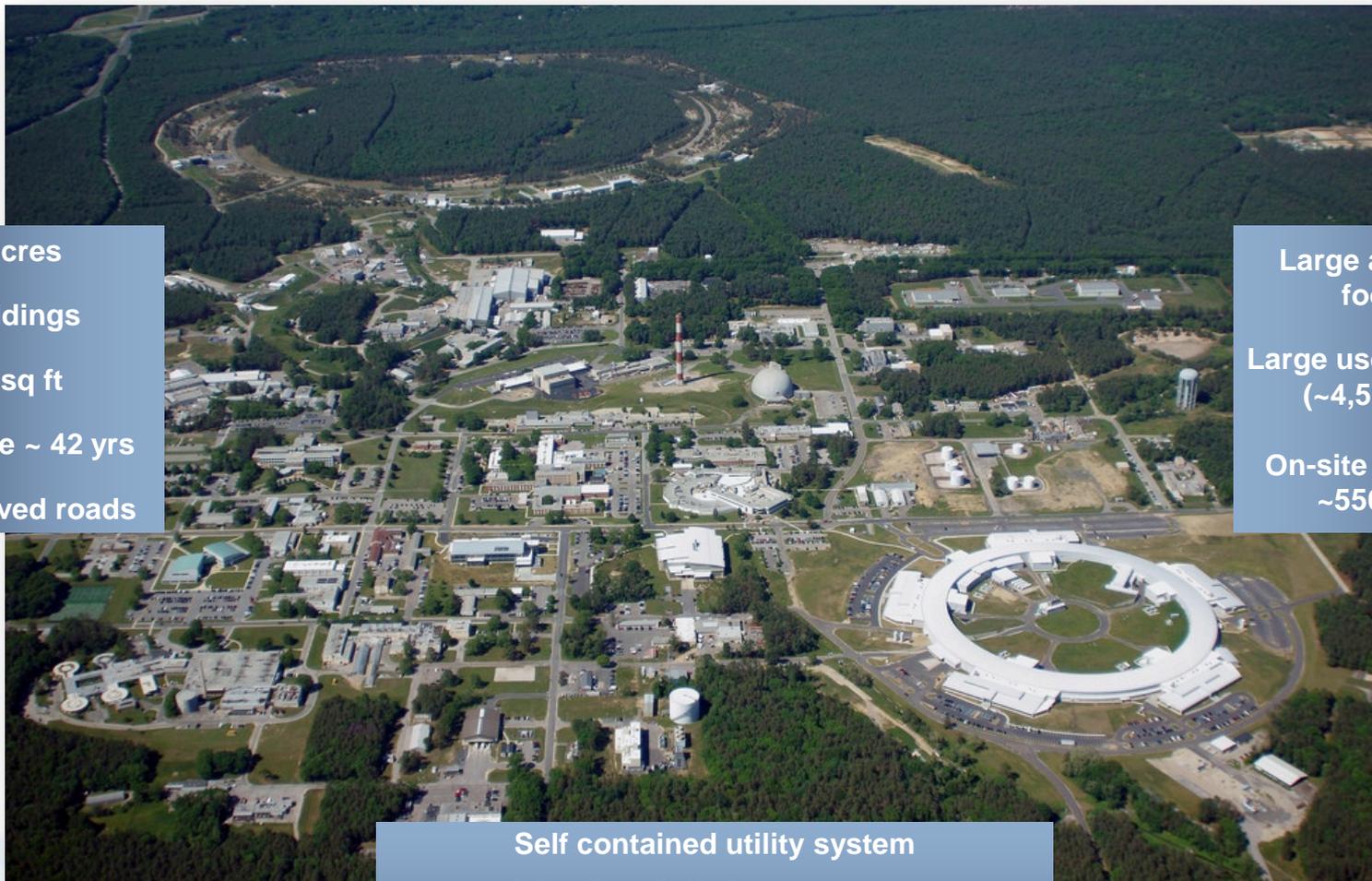
*a passion for discovery*



U.S. DEPARTMENT OF  
**ENERGY** | Office of  
Science

# Brookhaven National Laboratory

*An evolving infrastructure capability enables a passion for discovery*



5320 acres

321 buildings

~4.9M sq ft

Average Age ~ 42 yrs

35 miles paved roads

Large accelerator footprint

Large user population (~4,500 users)

On-site housing for ~550 people

Self contained utility system  
9.7 miles chilled water piping  
35.4 miles potable water piping  
10.2 miles steam/condensate pipes

# The Next Decade of BNL Science

*Our Vision is driven by Six Critical Outcomes and Premier User Facilities*

Understanding the origins of matter and mass

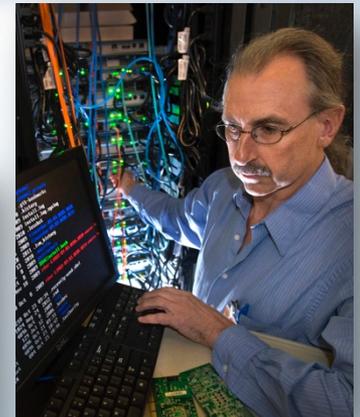
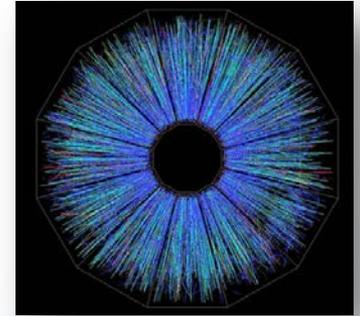
Transformational discovery through synchrotron science

*In operando* and *in situ* energy science leadership

Leadership in data-driven discovery

Renewed research campus that enables BNL's research mission

Safe, efficient operations that ensure Delivery of BNL's research mission



Critical Outcomes

# Recent Investments Have Created Impact

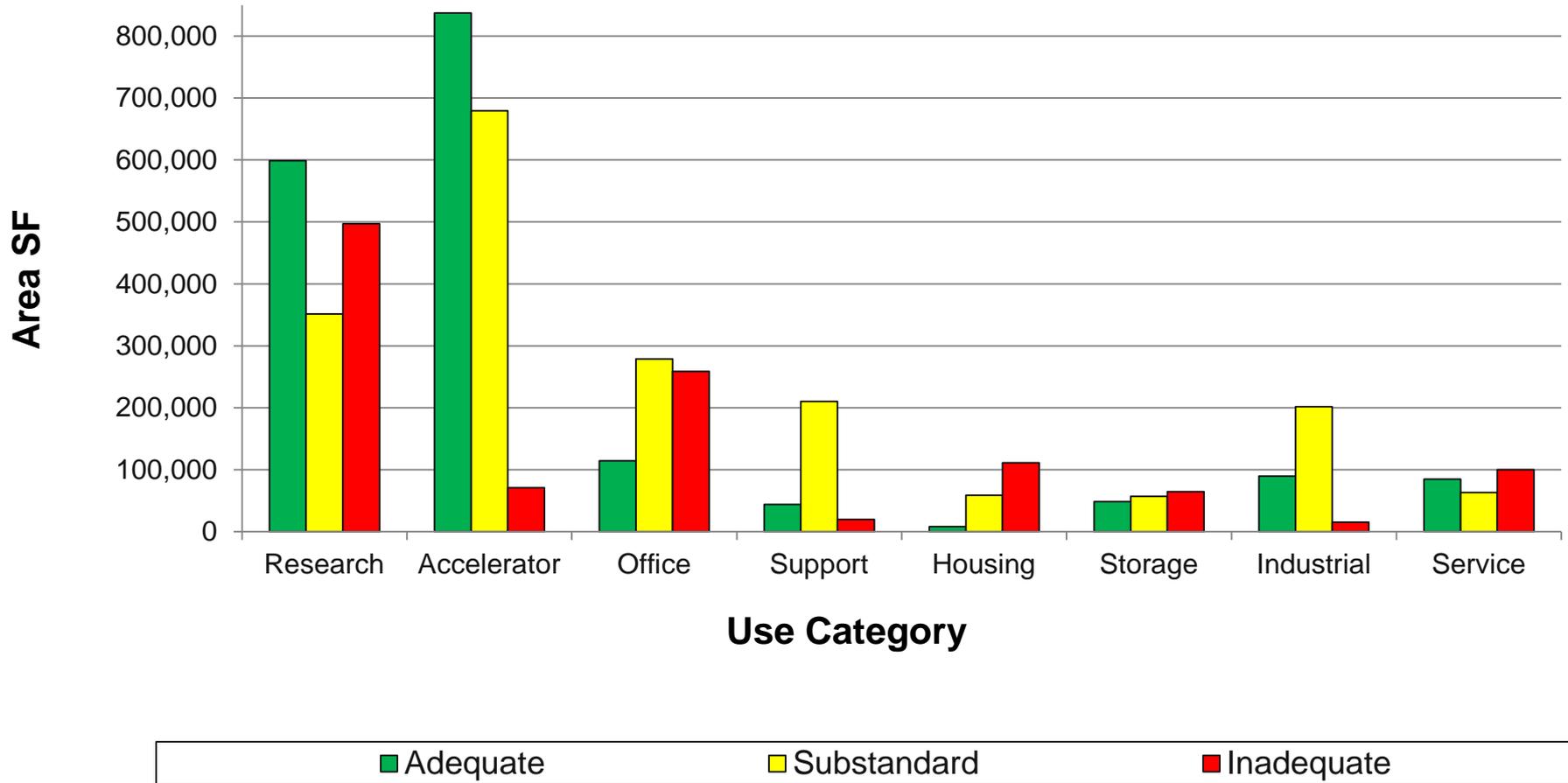
*Creating safe, mission-ready science facilities and infrastructure*



- Recent DOE Federal investments have substantially changed the BNL landscape
  - Reduced average age of facilities by 5 years
  - Built ~870K sq ft of new research and support facilities
  - Renovated ~124K sq ft of core science buildings
  - Revitalized facilities also drive positive change in spirit and culture

# Building Condition By Use Category

*Investments in support infrastructure continues to be a growing need*



# Ten-year BNL Campus Vision

*Delivering the next decade of science while transforming the Laboratory Campus with a diverse investment portfolio*



- Focus key Federal investment in critical core buildings to enable the scientific agenda
- Make research safe and cost effective by downsizing the campus and demolishing old buildings
- Ensure scientific reliability through targeted utility infrastructure investments
- Support the growing population of critical scientific users through an innovative public-private concept of Discovery Park

# Core Facility Revitalization

*Repurposing projects to revitalize core capability for the next decade of BNL science*

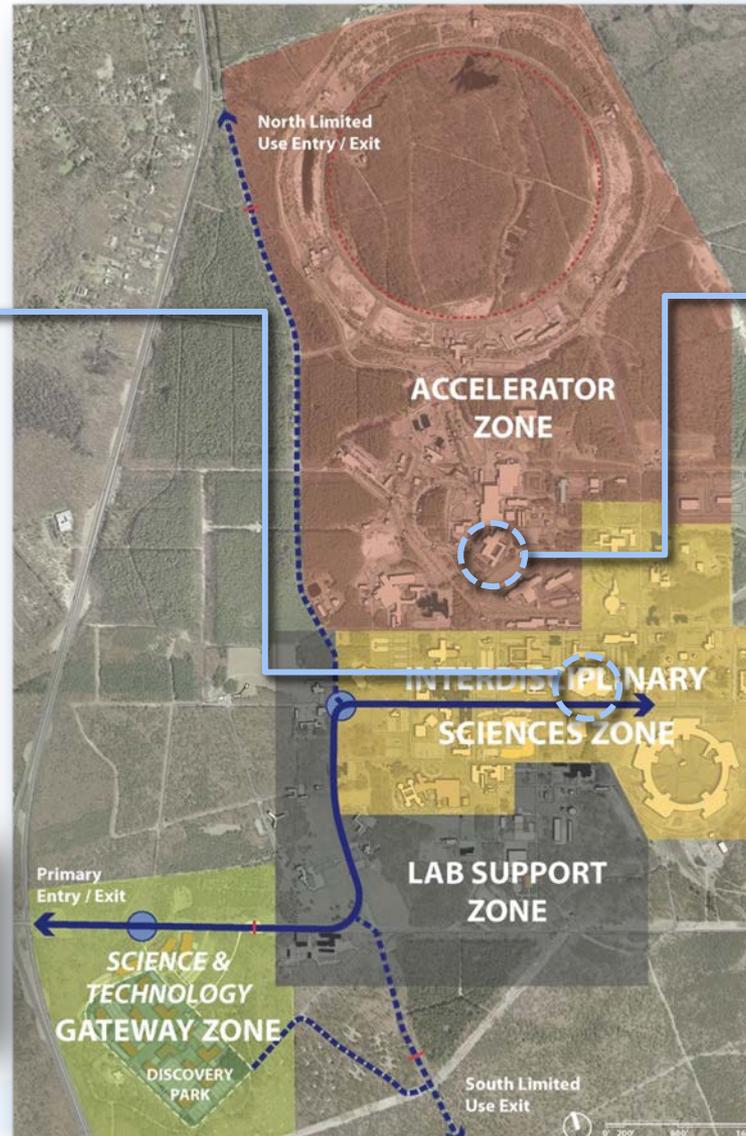
## CFR-I ~ Integrated Sciences Computing Center

- Scope: Repurpose B/725 (NSLS-I) as a key Laboratory multi-purpose facility
- Renovate 60-80KGSF to achieve a mission-critical computing capability
- Cost: \$40 Million
- B/725 was constructed in early 1980's with a major office addition in the late 1980's (total of 156KGSF)
- Leverages the significant utility infrastructure made available by transfer of operations to NSLS-II



## CFR-II ~ Accelerator Science & Technology Center

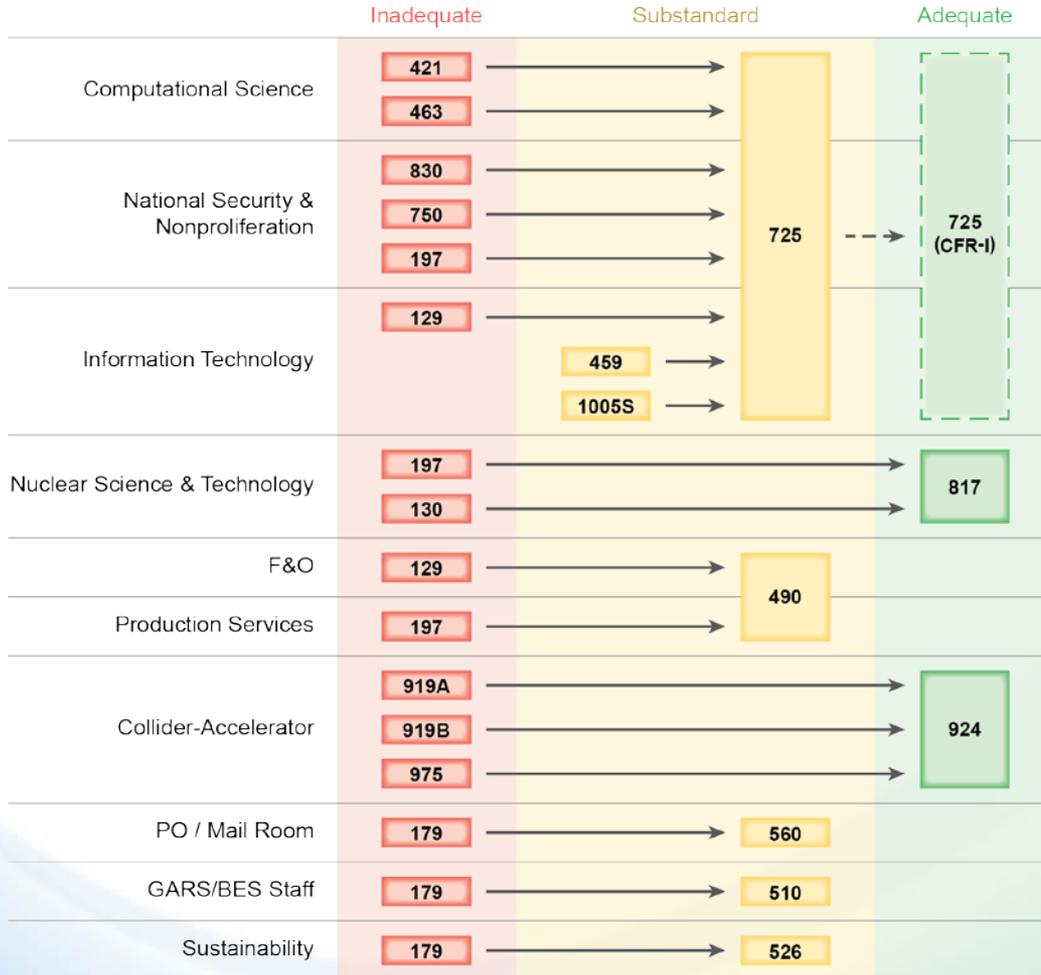
- Scope: Renovate B/911 for accelerator science and technology
- Comprehensive facility modernization of 55-70 KGSF
- Cost: \$30 Million
- B/911 serves as main office & control room for RHIC, NSRL & BLIP
- B/911 constructed in 1956 with a major addition in 1964
- Supports RHIC, eRHIC, ATF, and a broad range of accelerator science programs



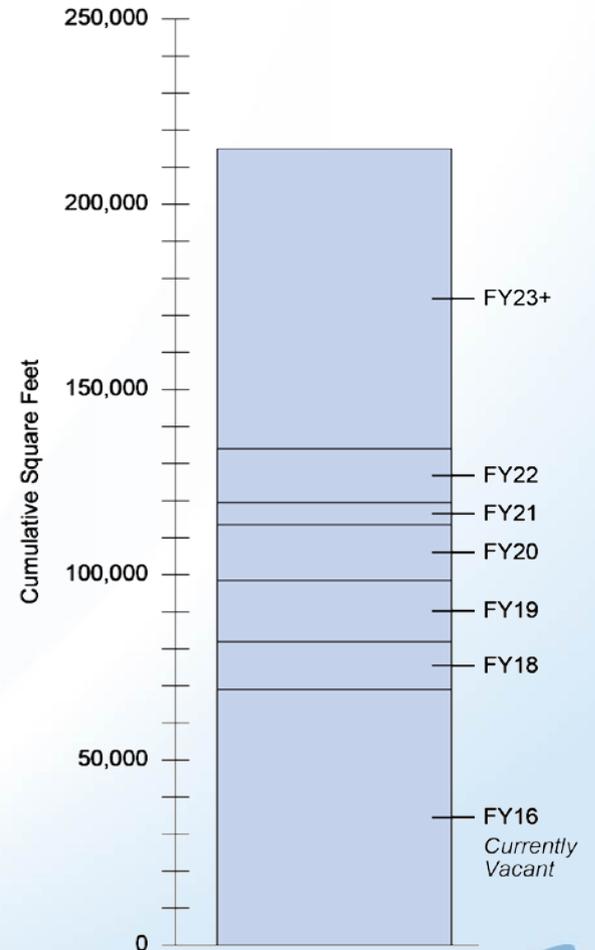
# Space Reduction Plan

*BNL has an ongoing multi-year plan to consolidate out of and demolish old inadequate buildings*

## Consolidation

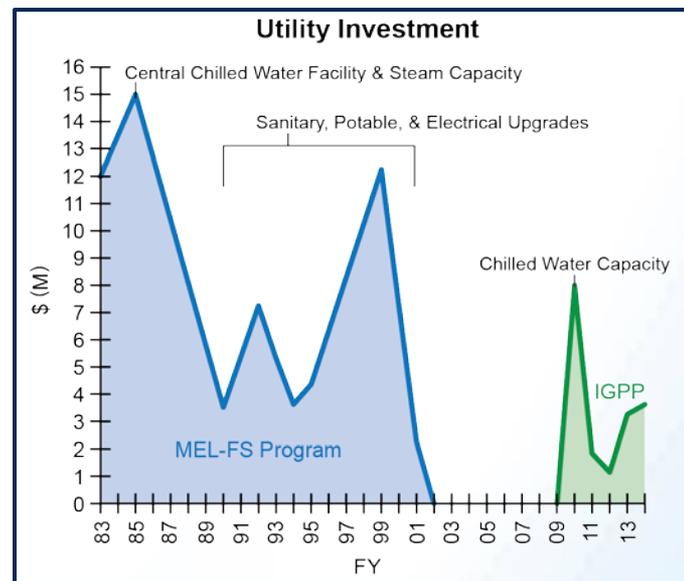


## Demolition



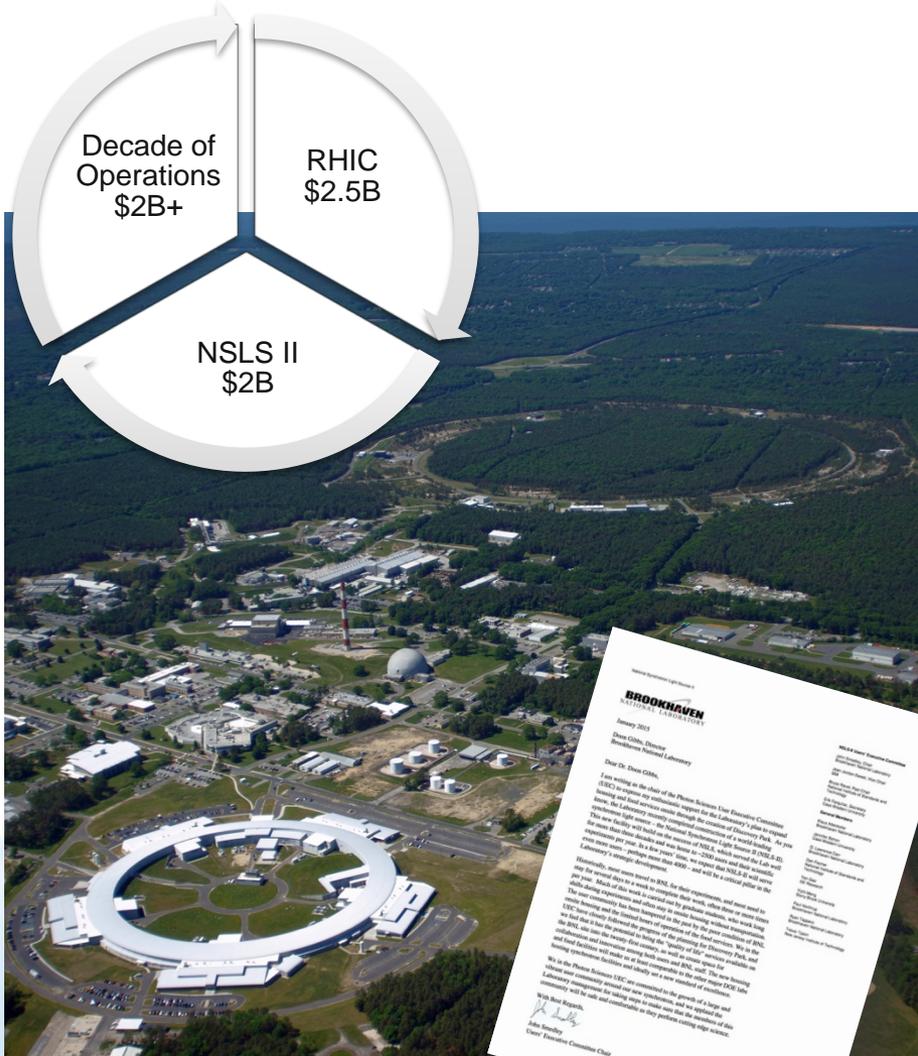
# Utility Investment Planning

- From 1983-2001 utility projects were supported directly through DOE Federally programs
  - 11 projects totaling \$70M enabled regular replacement/repair of critical infrastructure
- In 2012 BNL completed a utilities strategic plan using an expert A/E and BNL prioritized their recommendations to a high priority \$68M set of needed investments in:
  - Chilled Water
  - Steam Generation and Distribution
  - Potable Water Generation and Treatment
  - Electric Distribution
- BNL has a \$12.6M UESC in progress which upgrades lighting, controls, and installed an additional chiller capacity
- Planning underway for future phases of UESC investment including a possible Combined Heat and Power (CHP) facility



# Leveraging the Major Scientific Tools at BNL

*Attracting and maintaining the user community provides the intellectual capital to realize the full value of the significant DOE scientific investment*

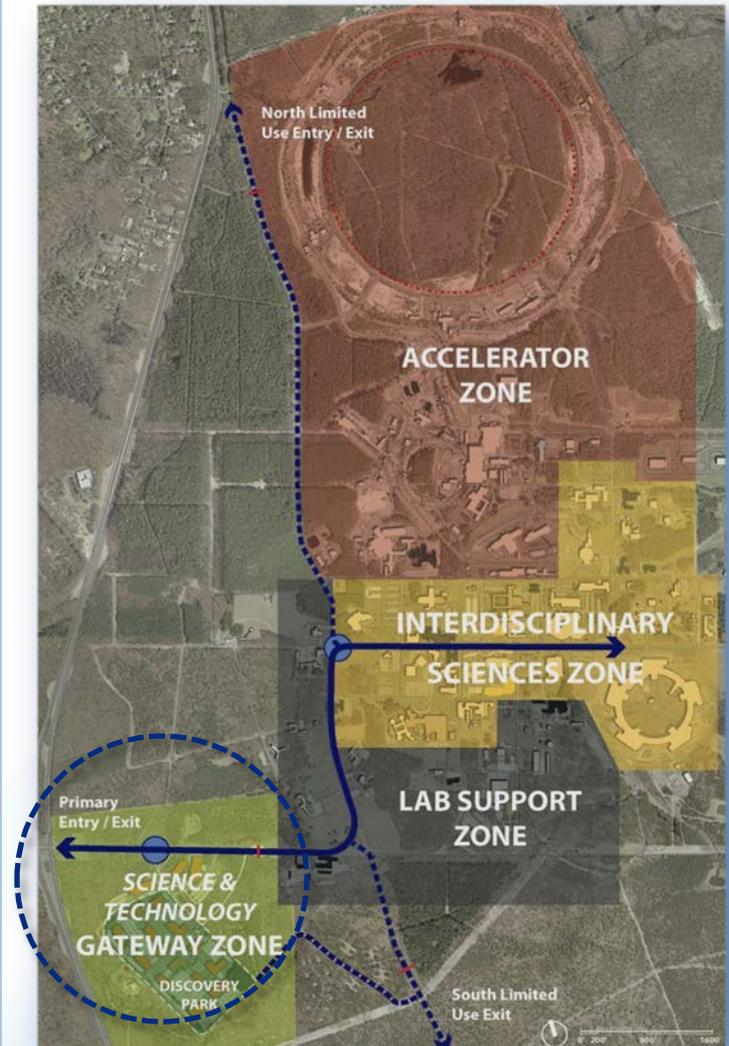


- The RHIC/AGS Complex, NLSLS II and CFN represent billions of dollars of historical and future investments by DOE
- The recent facility assessment process found that nearly  $\frac{3}{4}$  of the BNL support space is either substandard or inadequate
- The major three User Communities have all expressed their significant concern over the BNL conditions and have voiced strong support for the Discovery Park concept and vision
- The next decade will see significant growth in scientific users from 4500 to 6000.
- The tools of the next decade will drive a data explosion requiring on-site analysis and visualization tools, increasing user residence time
- There is a significant need for renewed on-site, reasonably priced, high occupancy housing which will be synchronized with ongoing commercial development and Discovery Park

# Discovery Park – a Transformative Project

*Delivering support capability to the DOE mission scientific tools with reduced Federal investment*

- Envisioned as a joint partnership with external public/private resources through an alternative land use
- Leveraging partnership with GSA to enhance the DOE's investment
- Discovery Park brings a new face to the Laboratory and provides valuable capability for the Laboratory as well as local and regional benefit
- This Gateway Zone will develop a "Research Village" with flexible growth to fill three key capability gaps
  - User amenities and housing
  - Site infrastructure renewal and operational efficiency, and
  - Expansion for industrial/commercial strategic partnership space

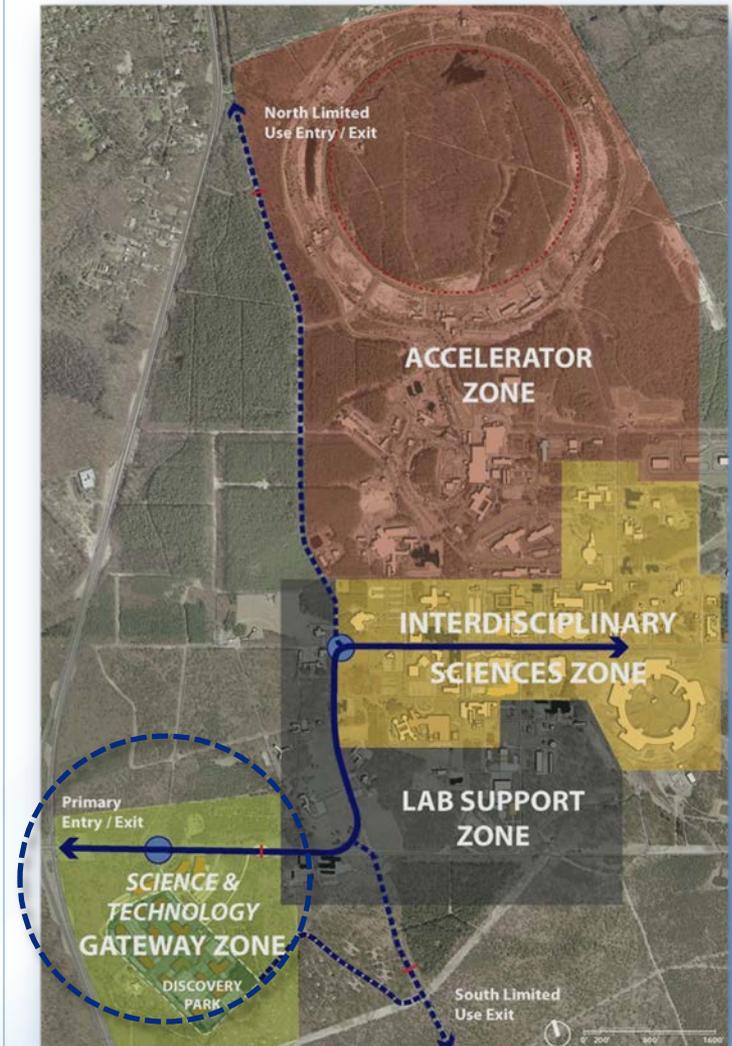


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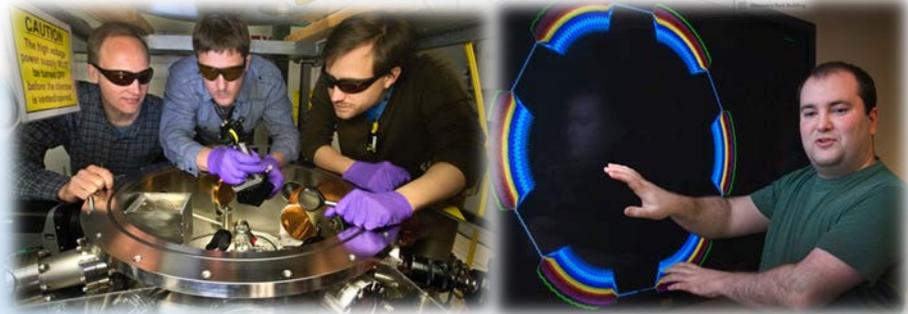


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# BNL Campus Development Summary

*Our infrastructure plan is aligned to achieve the scientific vision*



- Our plan will sustain and accelerate the visible transformation already underway
- Our plan builds on a DOE-wide capability assessment and is designed to deliver cost effective, reliable, and capable science
- Our focus on the user facilities recognizes that scientific output and innovation is dependent on attracting the best, brightest, and most diverse research community to leverage mission-capable facilities
- Our plan maximizes a diversity of resources and the long-range view enables effective annual decisions