

BNL Infrastructure Management

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October 8, 2009



BROOKHAVEN
NATIONAL LABORATORY

a passion for discovery

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



Brookhaven National Laboratory *A passion for discovery*



5321 acres

350 buildings

~3.2M sq ft

29 miles paved roads

12 miles
sidewalks

Housing for ~800

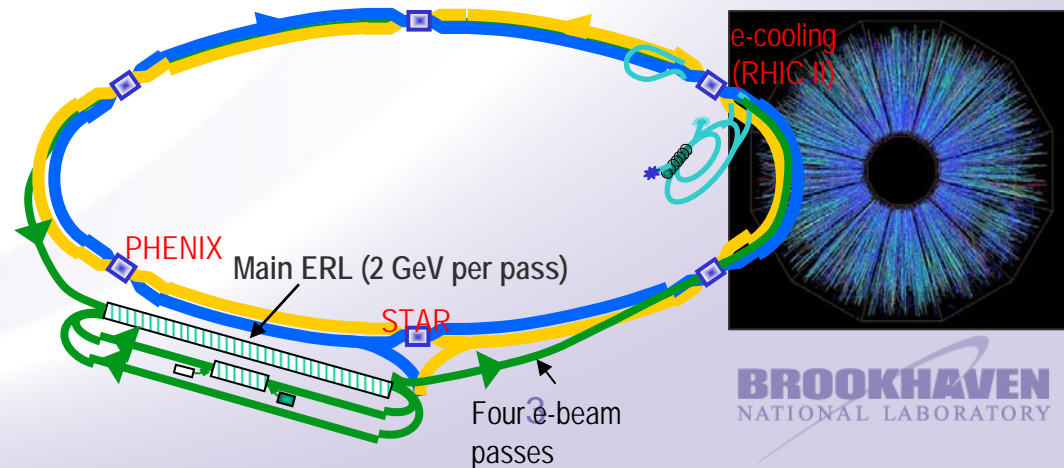
~2750 employees

>4000 guest users per year

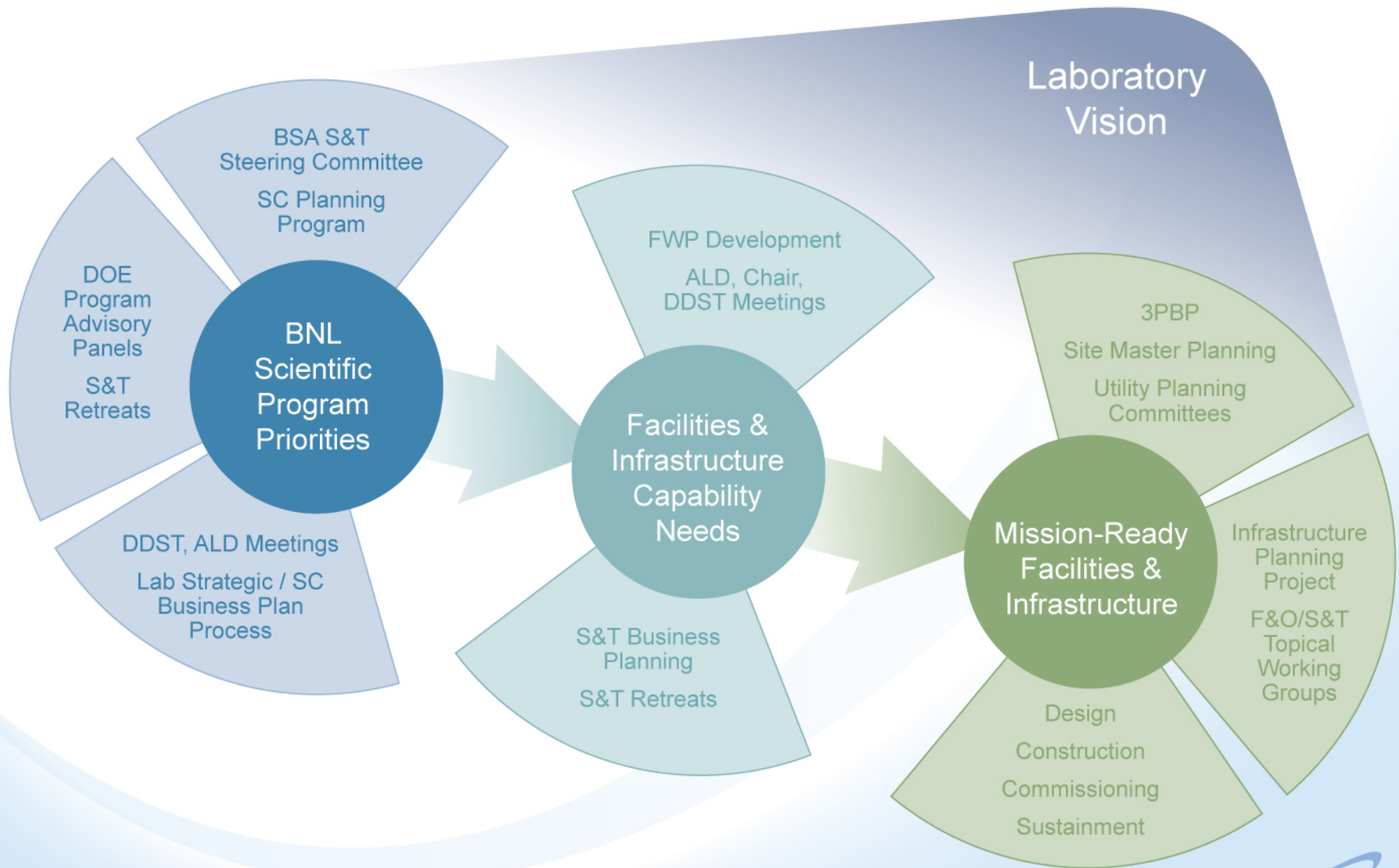
FY08 Funding \$532M

It's All about the Science

- **NSLS-II** – the world's best synchrotron light source
- **RHIC and eRHIC**, the world's highest energy machine for fundamental nuclear physics
- **Nanoscale Science Research Center**
- **Energy** – new multi-program initiative
- **Climate Science**
- **Medical Imaging**
- **Computational Science**



Translating Science Priorities Into Mission-Ready Facilities and Infrastructure



The Case for Modernization

- Average age of active buildings is 44 years
- 69 buildings (~850K sf) date back to WW II
- 17% of offices are in old WW II buildings
- Most Laboratory space constructed in 50's-60's
- Laboratory space inadequate for current scientific needs
- Mission Readiness requires both new construction and renovation



BNL Site Master Plan

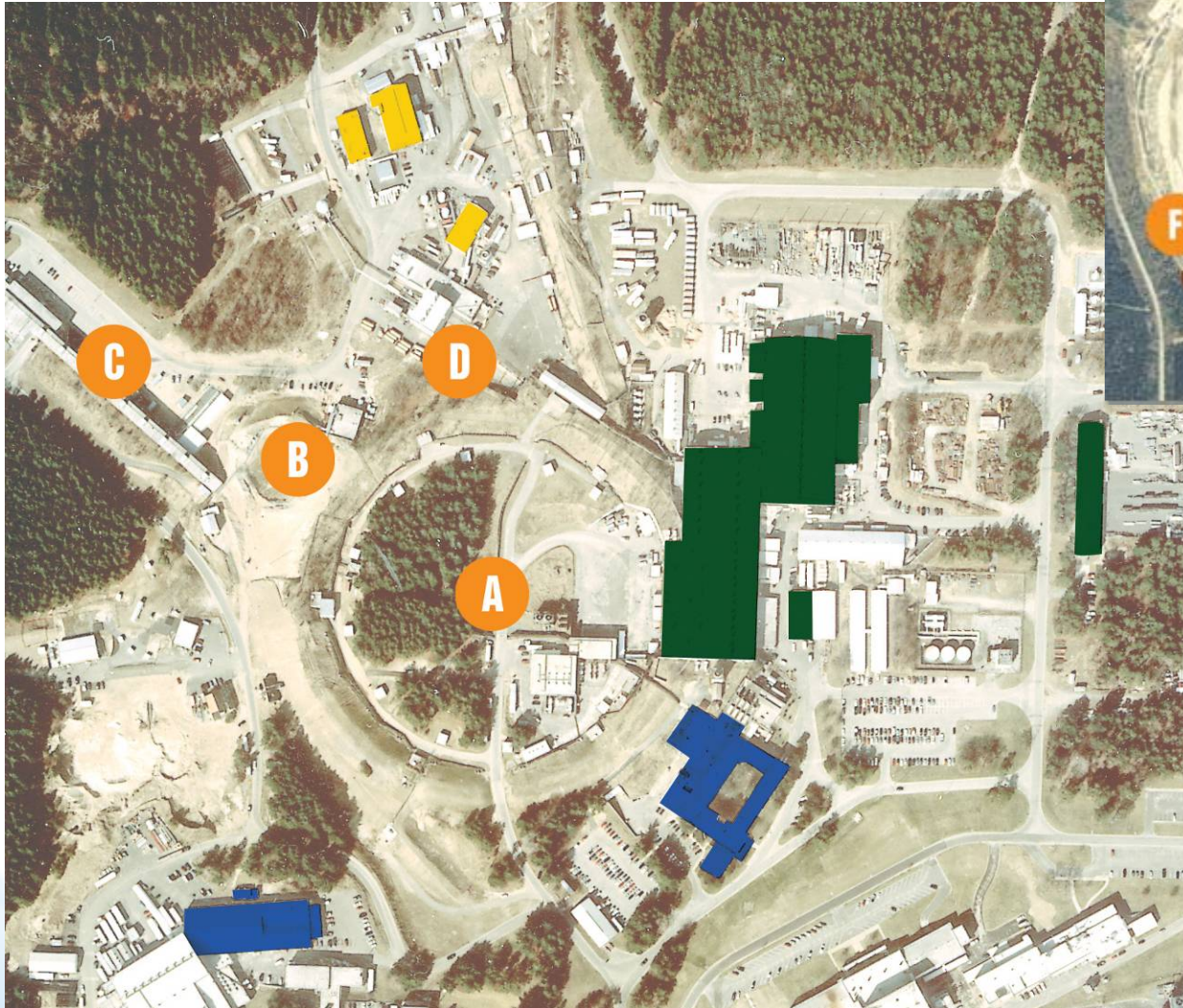
- Originally developed in 2000 – Updated in 2004
- Provides a physical development plan for planning decisions
 - A guide to transforming the campus to meet future vision and mission needs
- Initial Focus on main core campus
- Will be updated and expanded upon completion of current Infrastructure Strategic Plan activity



Master Planning Assumptions

Programmatic	Administrative	Site-Wide	Quality of Life
<ul style="list-style-type: none">• Accommodate Mission Themes• Improve User Support• Flexible, Inter-disciplinary lab space• Attract world class scientific staff	<ul style="list-style-type: none">• Eliminate old office buildings• Additional conferencing and video-conferencing• Modern Warehousing• Consolidate support groups• Modernize utility systems	<ul style="list-style-type: none">• Protect environment resources• Site zoning to guide new development• Information technology and networking• Historical facilities maintained• Security posture	<ul style="list-style-type: none">• Architecturally & aesthetically enhanced central avenue• Upgraded housing• Child development capacity• Recreational facilities• Transportation

North Site Area 2020



- A. AGS RING
- B. BOOSTER RING
- C. AGS LINAC
- D. NSRL
- E. RHIC RING
- F. PHENIX
- G. STAR

- Consolidate from – demolish
- Consolidate into
- Consolidate from – reuse
- Key Buildings
- Potential Areas for e-RHIC development

A Thoroughly Modernized BNL

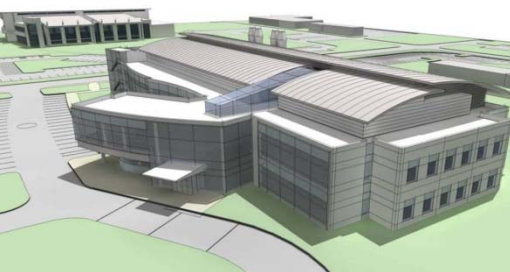
Moving beyond the 40-65 year old buildings

- Safe, secure and sustainable
- Attractive, reliable, and cost efficient campus
- World-class scientific user facilities
- Modern, state-of-the art, flexible science laboratories
- Fosters new ideas and initiatives
- Attracts and retains top talent
- Encourages collaboration & interaction





Brookhaven National Laboratory *Infrastructure Planning Project*



Flad Architects

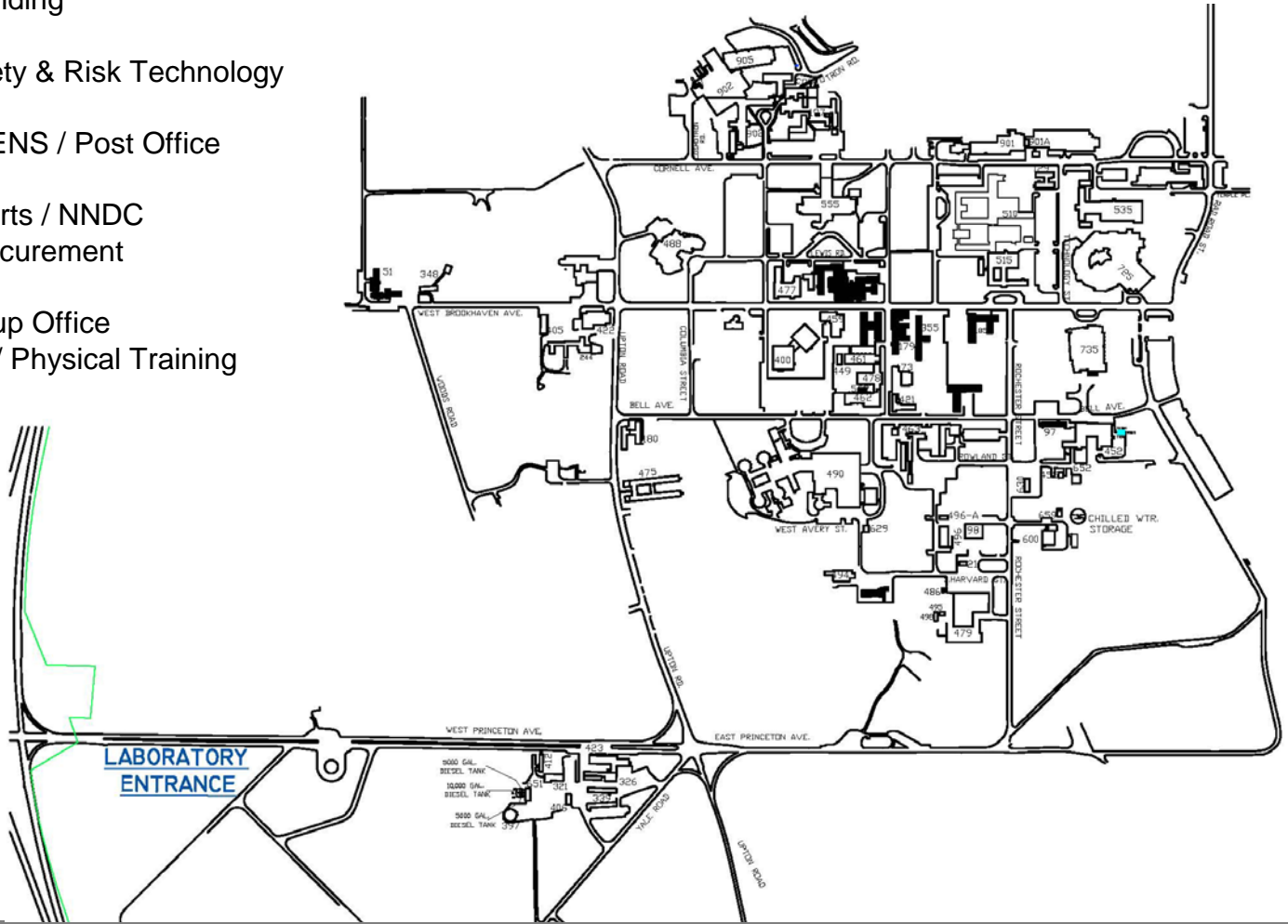
Interim Project Report

- Purpose: *Create an implementation plan for the BNL Master Plan*
- Objectives:
 - Achieve mission readiness
 - Optimize facility utilization
 - Retire obsolete building stock
 - Fully define all implementation and competing costs
 - Minimize logistical costs of SLI Program
 - Maximize “Bricks and Mortar” benefits of SLI Program
 - Maximize “whole building” approach to renovation (core facilities)
 - Configure projects to encourage inter-disciplinary collaboration

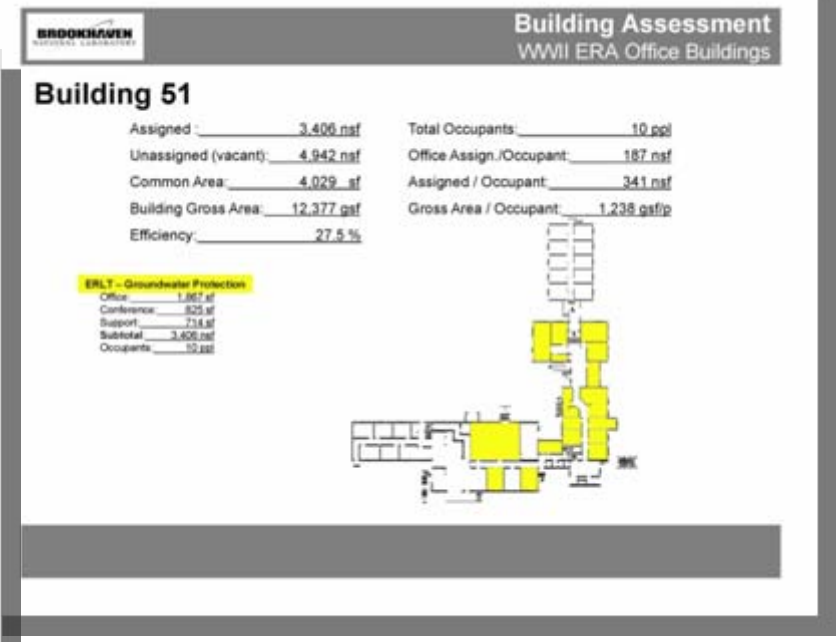
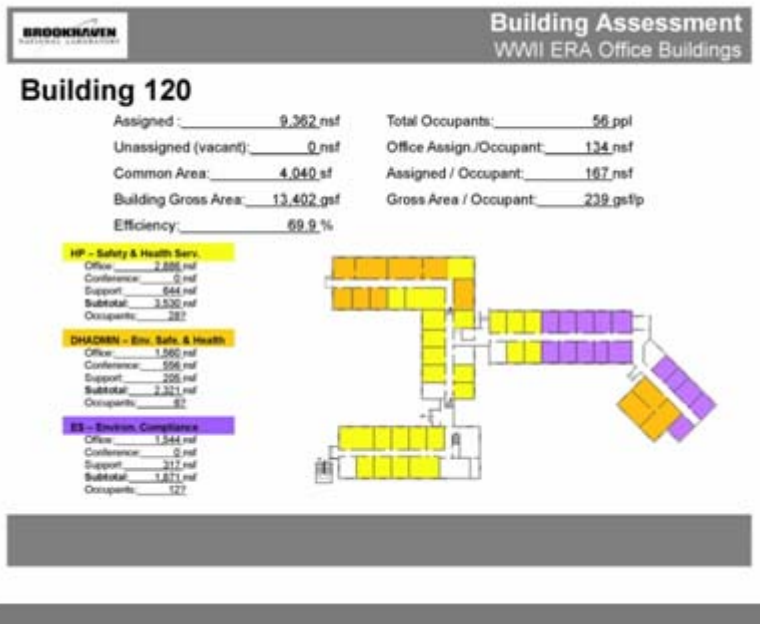
- Elimination of the WWII Office buildings
 - Characterization of the building occupation and utilization (13 buildings)
 - Creation of space standards to right-size future space
 - Programming of an alternative financed office building consistent with the master plan

Building No. Name

- 051 Environmental Restoration
- 097 Facility Operations Center
- 120 ESH&Q Office Building
- 129 ITD
- 130 Engineering / Safety & Risk Technology
- 134 Plant Engineering
- 179 Staff Services / EENS / Post Office
- 185 Office Building
- 197 NNSD / Graphic Arts / NNDC
- 355 Contracts and Procurement
- 460 Director's Office
- 464 DOE / BHSO Group Office
- 493 Video Work Area / Physical Training

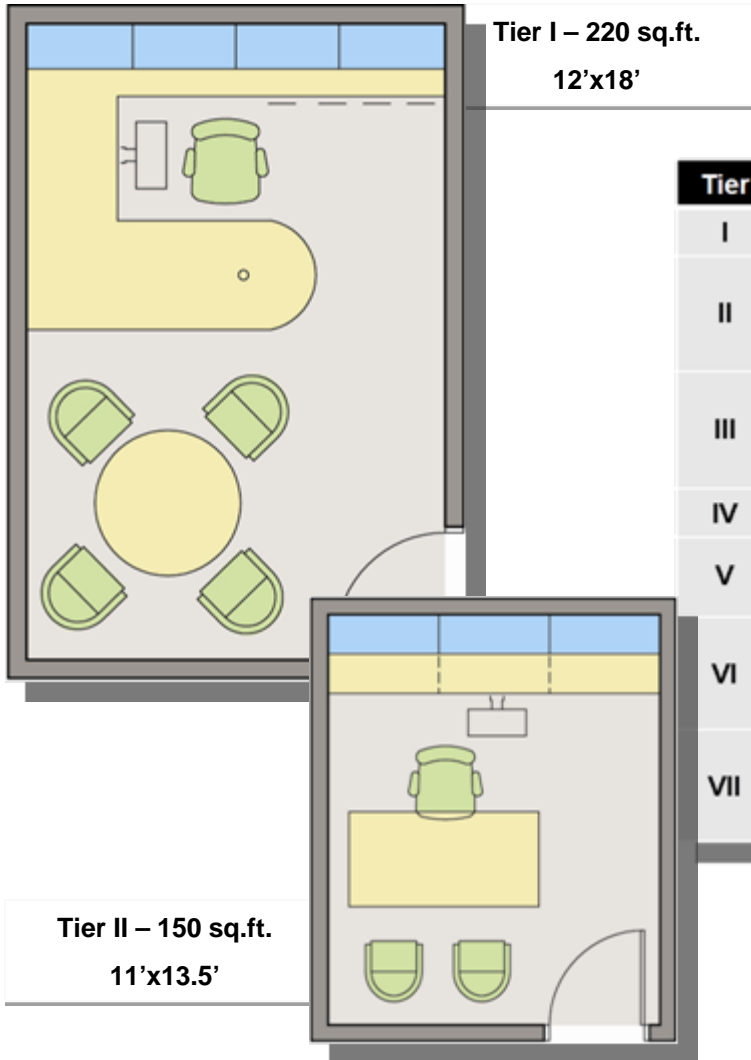


Characterization



- Total personnel accommodated – 465
- Total area currently assigned – 115,000 sf
- Gross area of buildings so occupied – 215,000 gsf
- Gross area per occupant – 462 gsf/p – nearly twice commercial standards

Example Space Standards



Proposed Office Accommodation Tiers

Tier	Title(s)	Level	Office Type	Recomm. Standard
I	ALD's	Level 1's	Private Office	220
II	Office Managers Division Managers Department Chairs	Level 2's	Private Office	150
III	Principal Investigators Senior Scientists Managers	Level 3's	Private Office	130
IV	Scientist		Private Office	100
V	Scientist Professional (Non-Science)	Exempt Employees	Workstation	100
VI	Post-Docs Administrators Technicians	Exempt Employees	Workstation	72
VII	Clerical Administrative Technicians	Non-Exempt Employees	Workstation	64



- Results:

- The effort has sized an Alternative Financed office building at 140,000 gsf to replace the 13 wood office buildings
- This represents a reduction in gross area of 35% over current WWII era buildings, and an associated cost savings for reinvestment in infrastructure maintenance
- There will be complementary savings due to increased efficiency of operations
- Development of an Alternative Finance Project is included in the FY 2010 Business Planning

- Eliminate old WWII Office Buildings
- Logistical planning for renovation projects
- SLI Project planning
- Mission readiness evaluation of existing core laboratory buildings
- Maintenance Shops consolidation
- C-AD Consolidation Planning
- Housing, conferencing, Child Care
- Laboratory Growth

Final Product is an updated Master Plan with a cost-loaded implementation plan

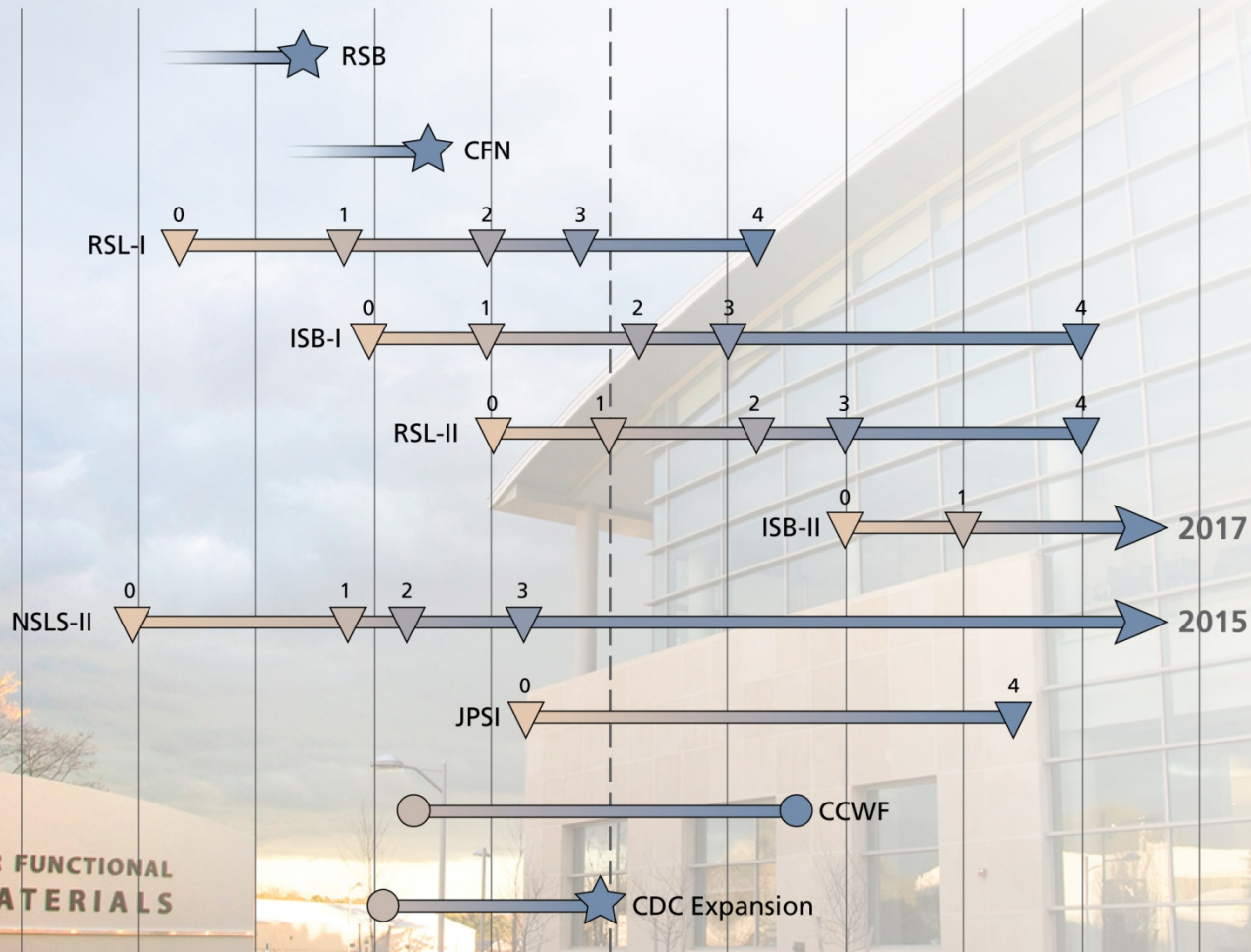
Major Project Schedules

Fiscal Years

05 06 07 08 09 10 11 12 13 14



LEED Silver



Status of Major Projects

- RSL-I \$18M
 - CD-3 approved in July 2009
 - Building renovations underway in Buildings 480 and 815
- RSL-II \$50.8M
 - CDR completed March – August 2009
 - CD-1 achieved in September 2009



Status of Major Projects

- ISB-I accelerated with ARRA funds
- “4 for 4” on Critical Decisions for 2009

Project	CD	Baseline	Actual
RSL-I	3	6/30/09	6/19/09
RSL-II	0	10/31/08	10/10/08
RSL-II	1	9/30/09	9/02/09
ISB-I	2A/3A	9/30/09	9/24/09



Status of Major Projects (cont.)

■ CCWF \$18.3M IGPP/NSLS-II Project

- Joint project for general infrastructure and NSLS II
- Design complete
- Construction contract awarded July 2009



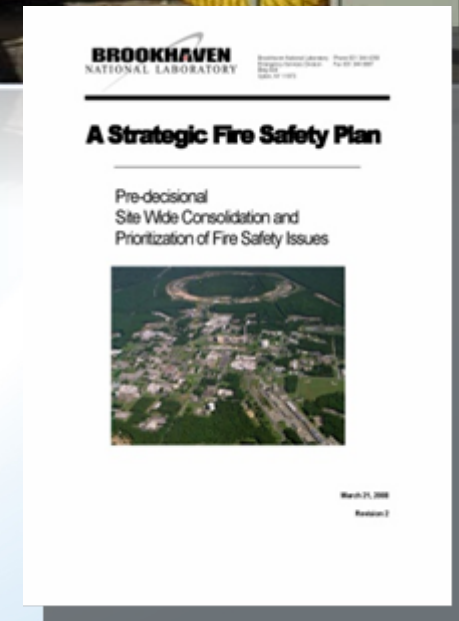
■ Computer Data Center Expansion - \$4.8M GPP

- Provides 6600 SF of raised floor computer expansion space
- Construction started Sept 2008
- Substantial completion July 31, 2009
- Fully operational by November 2009

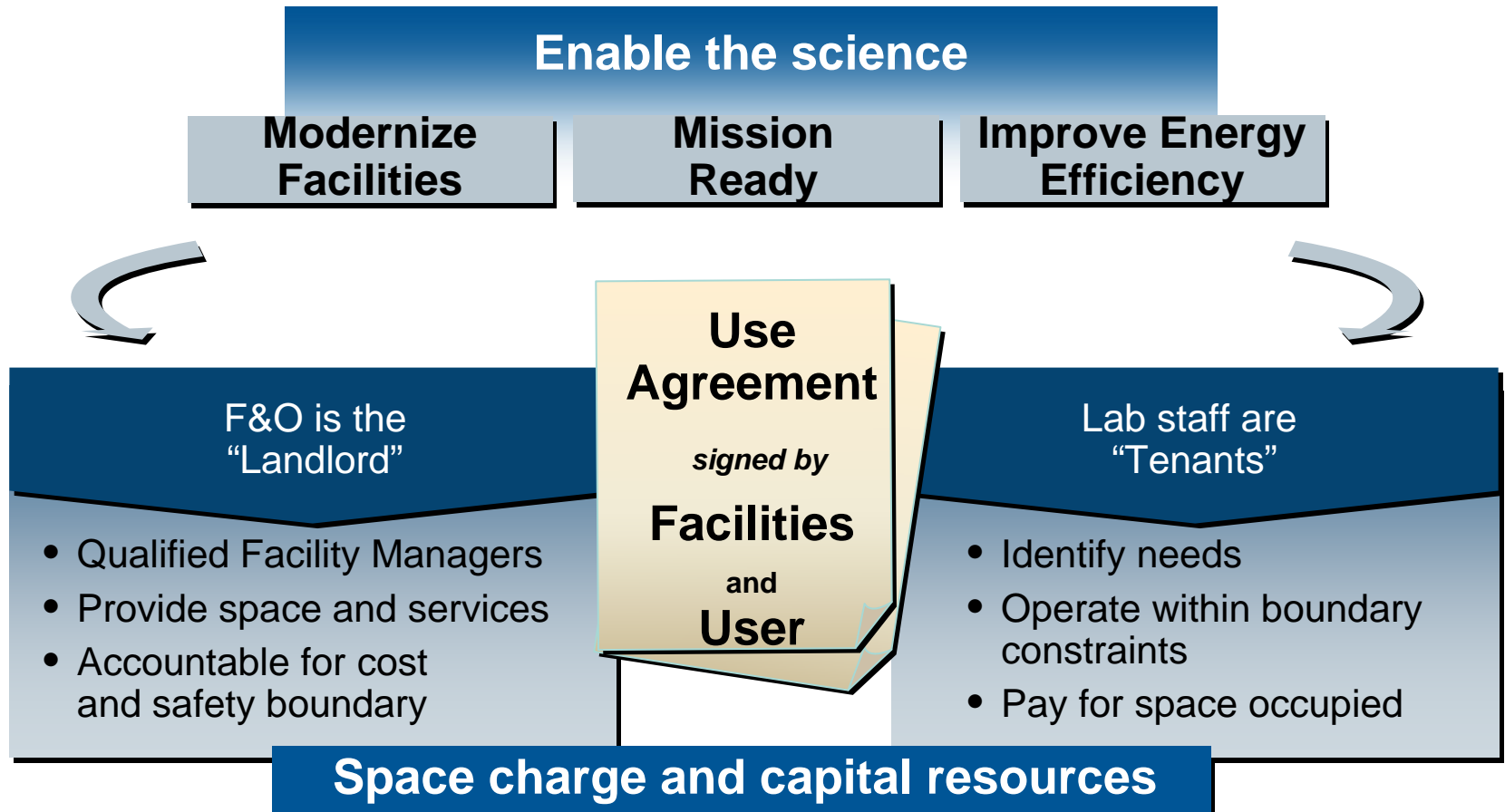


ARRA Stimulus Projects

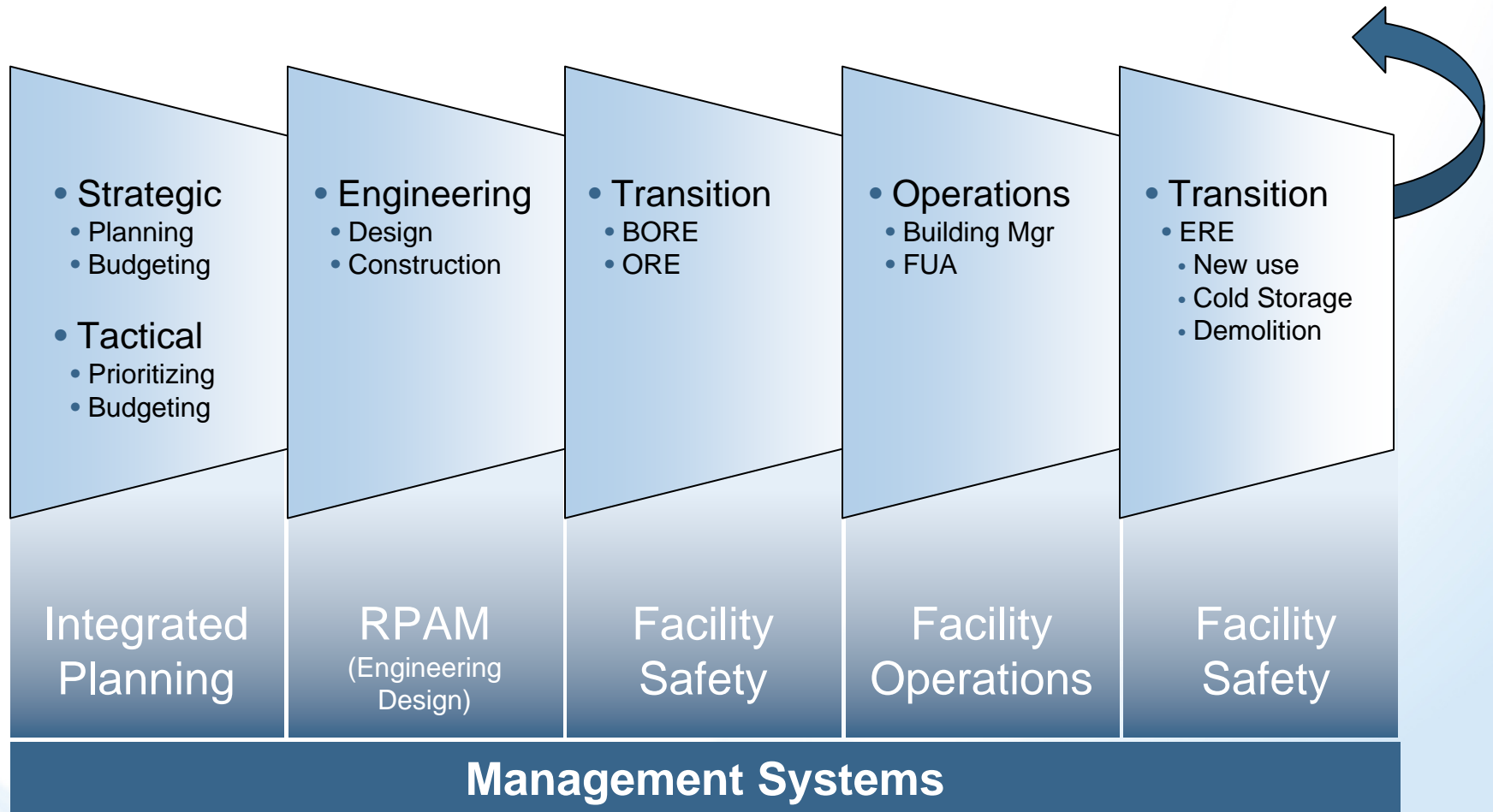
- An Institutional View of infrastructure has enable BNL to capitalize on ARRA investments
 - Significant acceleration of ISB-I (\$18M)
 - Roofing – over 13 buildings (\$9M)
 - Mechanical & Electrical upgrades (\$7M)
 - Over-dutied electrical equipment
 - New 13.8 kV feeder
 - New exhaust stack
 - Upgrade air handlers
 - Fire Safety Concerns – Chemistry Bldg (\$2.5M)
 - Ductwork insulation upgrade
 - Sprinkler addition
 - Propane Generator replacement



We believe the Landlord - Tenant model is critical to mission readiness



Facility Life Cycle



Integrated Life-Cycle Facility Management

- Achieving the vision depends on successful planning, execution and sustainment of the BNL Facility Infrastructure
- BNL has a well thought out Master Plan
- An Implementation Plan to achieve the Infrastructure Vision is being prepared
- The reorganization of F&O has created a Modernization Project Office to deliver the modernized campus
 - A certified EVMS system is in place and functional
 - BNL has implemented an improvement plan for Project Management based on early lessons learned
- Tools and processes for sustainment are being implemented
 - The Facility Operations Center elevated in the structure and importing new tools for facility operational planning
 - BNL is moving toward a Landlord-Tenant Model and improved integrated management of facility life cycle
- The vision for modernization is being broadly shared