Effective Repurposing to Create a Scientific Workplace and Learning Environment for the Future

Mark Searls, Leslie Saunders and Steven Shaw

October 28, 2011

BIOGRAPHIES

Mark Searls AIA

Design Principal
Flad Architects

With more than 22 years experience, Mr. Searls understands the specific interests of faculty and administrators as well as the general requirements for design leadership in a collaborative process. He has designed facilities for numerous academic institutions, including renovation and new-build projects for laboratory environments, residence halls, centers for the arts and student learning centers. Mr. Searls' approach to design evolves from a specific project vision and expresses the unique needs and aspirations of clients and their communities.

Leslie Saunders AIA, ACHA, LEED AP

Senior Planner
Flad Architects

Mr. Saunders brings more than 30 years of architecture and planning experience specializing in projects for institutional clients in 27 states and on four continents. With five years of experience in a client role as the Director of Capital Planning for The Georgia Institute of Technology, he perceives a problem and its solutions from the viewpoints of both the planner/designer and the planner/user. While at Georgia Tech, Mr. Saunders oversaw the planning and design for over 1.5 million square feet of academic and research space, including both new construction and major renovations.

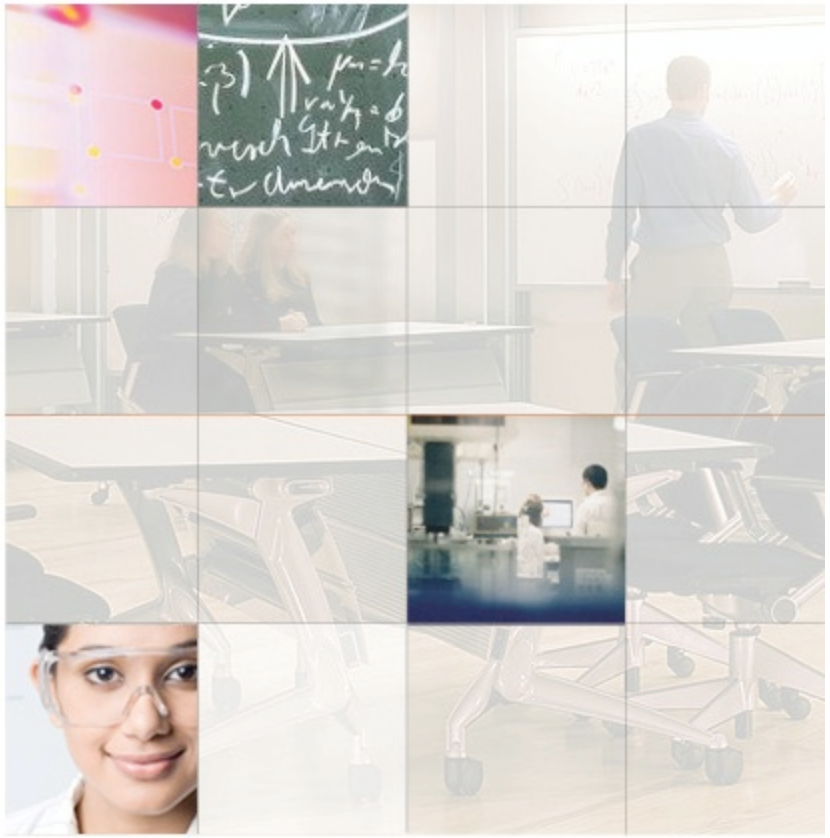
Steven Shaw AIA, LEED AP

Project Architect
Flad Architects

As a project architect, Mr. Shaw brings more than 12 years of experience serving clients throughout academia, healthcare, the private sector, and both state and federal government. The scope of his designs ranges from classroom and graduate-level research space for large academic institutions to high-level research laboratories for NASA and the DoE. His detailed and diverse knowledge positions him to be involved in all aspects of project phases, from user meetings, through construction modifications and to final facility reviews.

AGENDA

- **Planning Drivers**
  - Conditions and Circumstances that Inform and Influence Decision-Making
  - Scientific Workplaces and Learning Spaces
- **Renovating & Repurposing**
  - Challenges & Strategies
  - Opportunities
  - Adventures in Renovation
- **Case Studies**
  - Observations / Trends
  - Project Review



planning drivers:

- conditions and circumstances that influence decision-making
  - external
  - internal
  - program
- scientific workplaces and learning spaces

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PLANNING DRIVERS

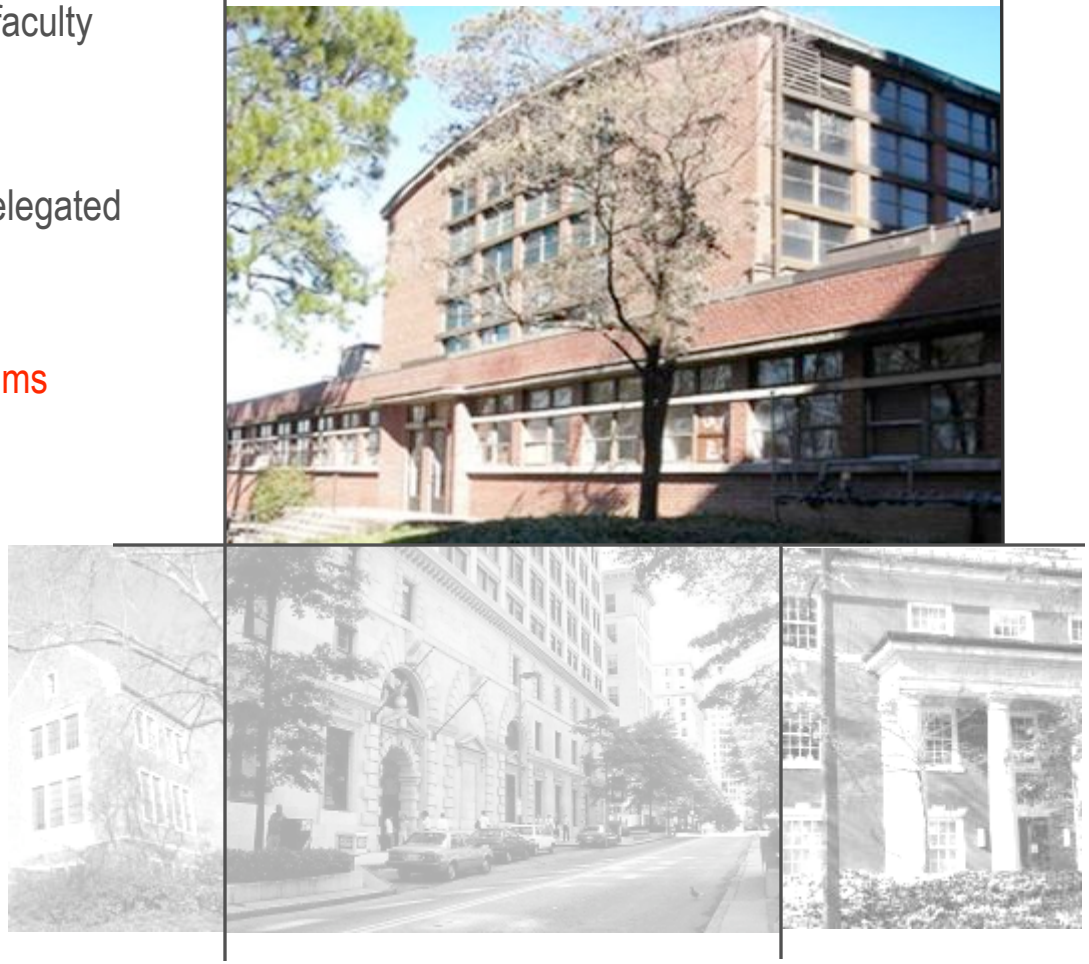
Conditions and Circumstances that Inform and Influence Decision-Making

- **External influences**
  - System or governmental mandates
  - Available funding, funding sources, funding cycles
  - Historic preservation groups and interests
  - Codes, rules, regulations, and standards
  - Alumni groups and sentiments
  - The neighbors

PLANNING DRIVERS

Conditions and Circumstances that Inform and Influence Decision-Making

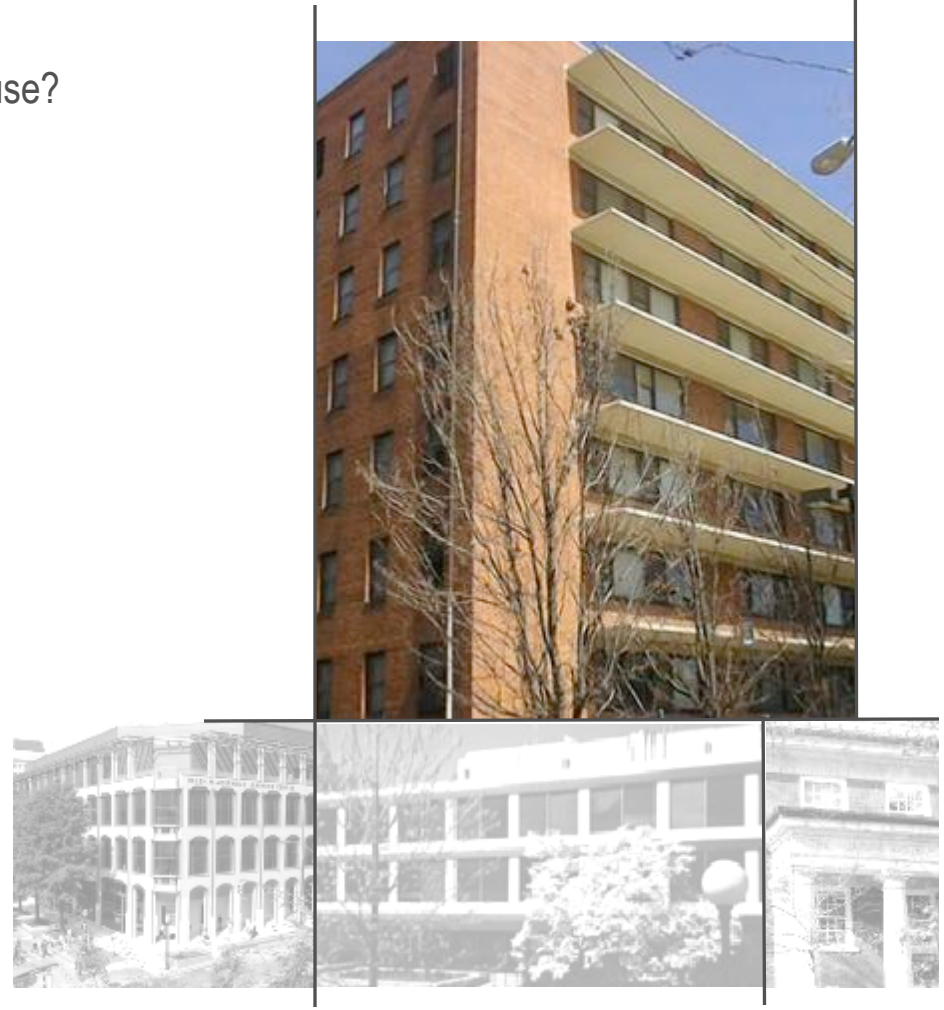
- **Internal influences**
  - Recruitment and retention – students and faculty
  - New, anticipated programs
  - Aged buildings and building systems
  - Available funds – majors, minors, MMR, delegated authority, PPV
  - Increasingly-deferred maintenance
  - "50-year" buildings housing 10-year programs
  - More students, fewer class sections
  - Silo-thinking



PLANNING DRIVERS

Conditions and Circumstances that Inform and Influence Decision-Making

- **Programming considerations**
  - **Fit analysis**
    - Is this building appropriate for the anticipated use?
      - Structural bay spacing
      - Floor-to-floor heights
    - Will the programmed area actually fit in the building?
      - Net usable area *vs.* assignable area *vs.* building gross area
      - The "renovation factor" – 15%, for some existing buildings
  - **Campus context**
    - Is the proposed use consistent with the Master Plan?
    - Is the building historic? *(or approaching 50 years?)*



PLANNING DRIVERS

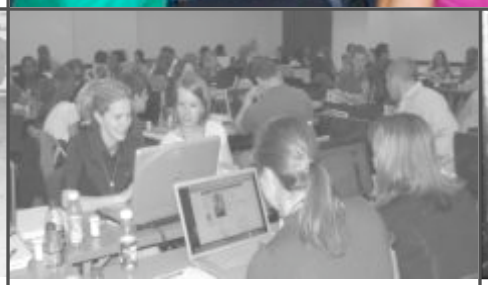
Conditions and Circumstances that Inform and Influence Decision-Making

- **Programming considerations**
  - **Phasing**
    - Is the building empty?
    - Multiple phases = more $$, longer time to occupancy.
  - **Swing space**
    - Where do the current occupants go?
      - Temporarily? Permanently?
      - Are these relocations accounted for in the budget?
  - **Budget**
    - What is (or *is not*) included?
    - Over how many fiscal years?
    - Is renovation truly less $$ than new? Good value?

PLANNING DRIVERS

Conditions and Circumstances that Inform and Influence Decision-Making

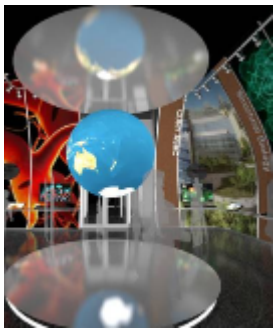
- **Programming considerations**
  - **Functional goals and intent**
    - Interdisciplinary programs
    - Changing approaches to teaching and styles of learning
    - Flexibility, adaptability
    - Improved utilization
    - Instructional technology
  - **Sustainability**
    - Georgia Peach Green Building System
    - LEED?



SCIENTIFIC WORKPLACES & LEARNING SPACES

Scientific Workplace of the Future Research Mission

To collectively articulate likely trends in the evolution of scientific endeavor over the next twenty years, in order that the environments we plan and design will be *effective in enhancing the potential of the occupants*.

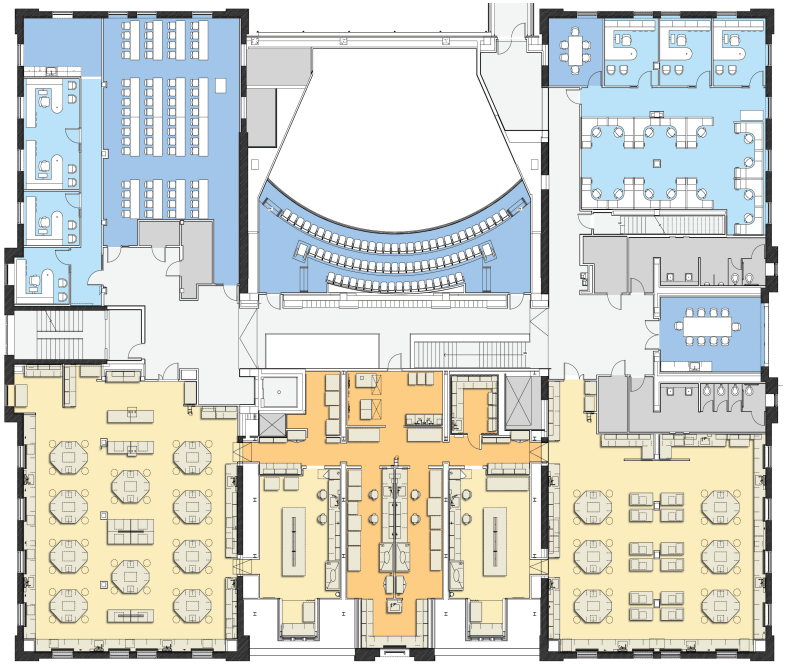


SCIENTIFIC WORKPLACES & LEARNING SPACES

SWOF Research Findings

- Achieving flexible lab space
- Characteristics of effective office work environments
- Aligning strategic business planning with appropriate facility responses
- Communications / global connectedness / IT
- Ownership of space – my space vs. our space
- Becoming more efficient / effective
  - Optimizing space, equipment, personnel
- Controlling costs / renovation / design-build / BIM
- Team size / lab size to drive innovation
- Reducing energy consumption in labs
- Relationships among lab / lab support / offices




renovating & repurposing:

challenges and strategies

opportunities

adventures in renovation

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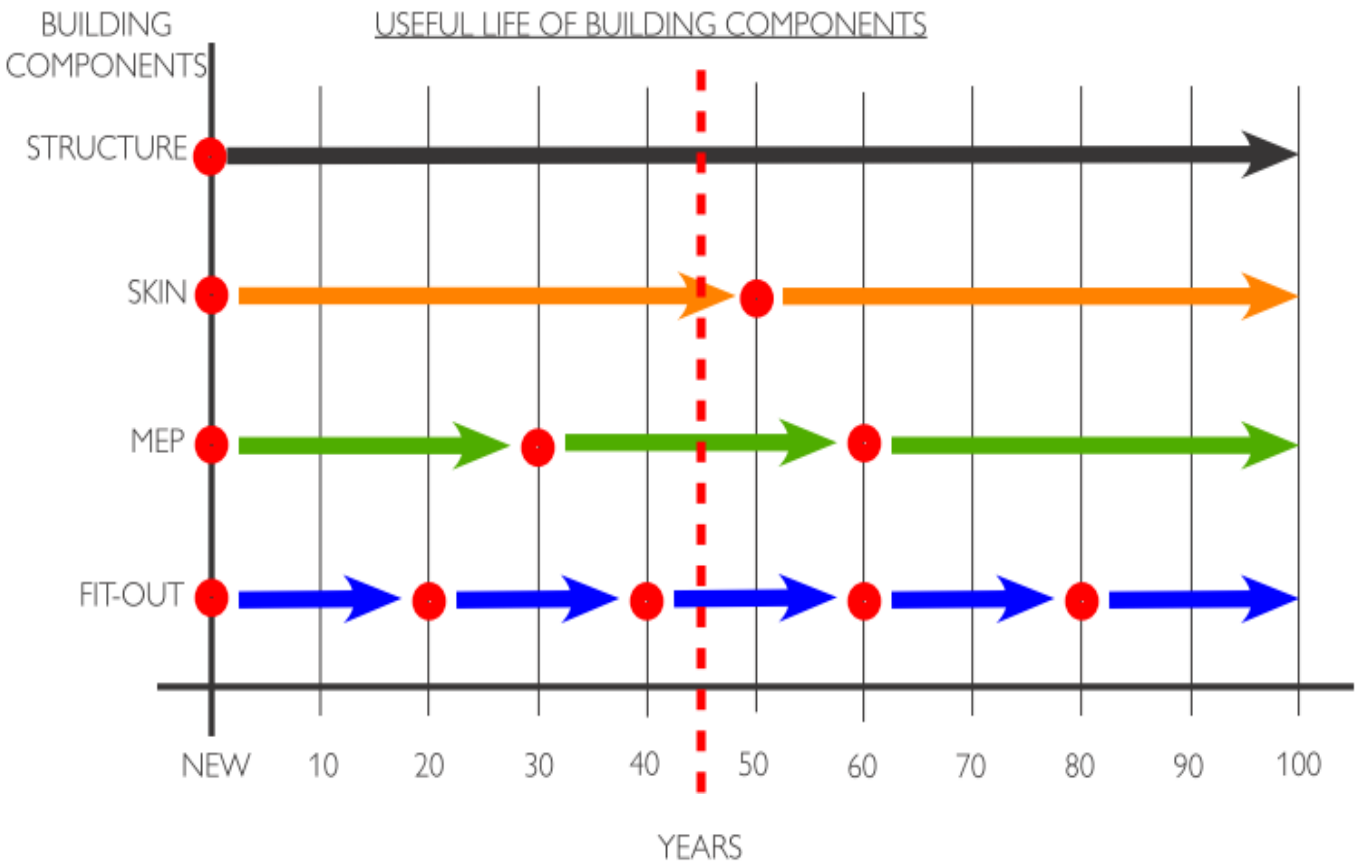
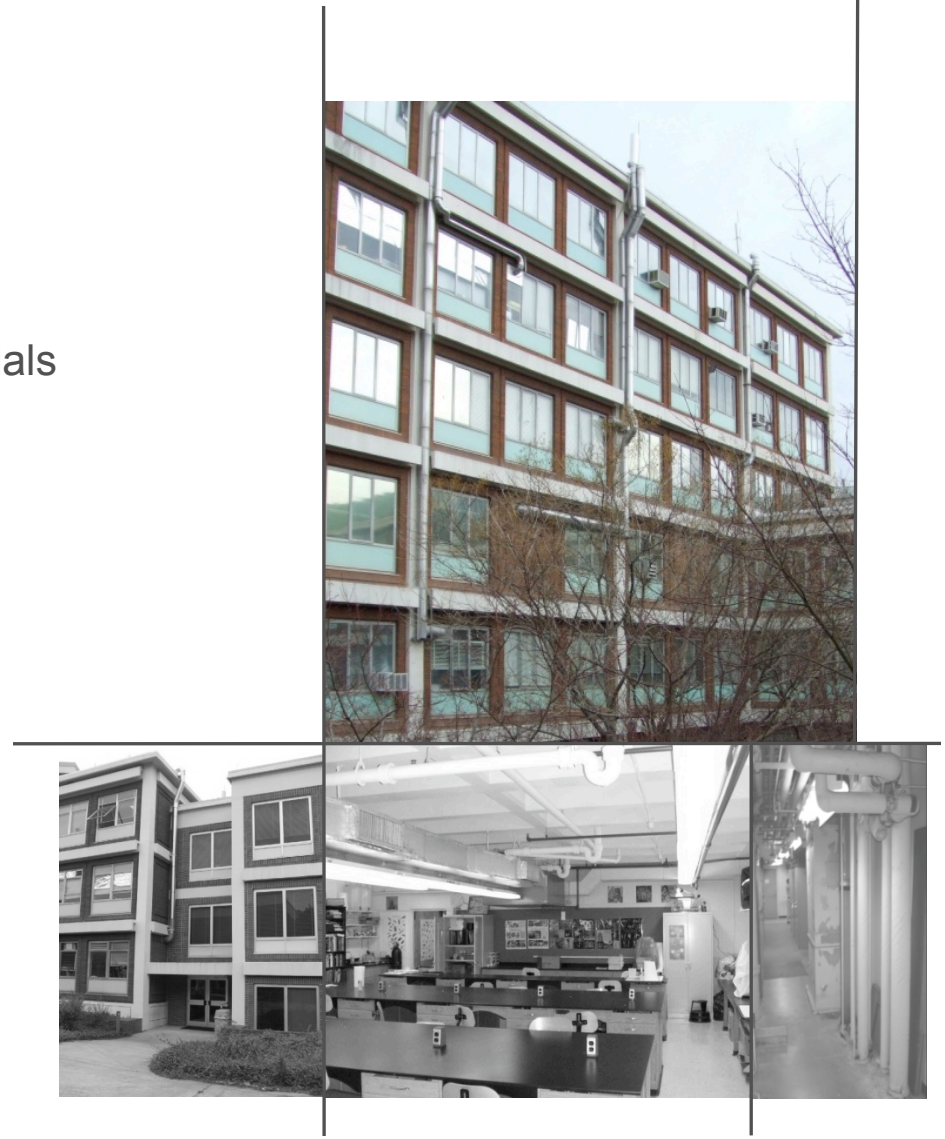
Challenges & Strategies: Existing Facilities

- Evaluating what you have…
  - Components of each building have a different useful life span



Challenges & Strategies: Existing Facilities

- Deal breakers
  - Structural condition
  - Floor to floor heights and bay spacing
  - Shell condition
  - Legacy contamination or hazardous materials
- Other potential risks
  - Life safety features; fire protection, exit facilities, etc.
  - Unforeseen conditions
  - Preservation related mandates
  - Mechanical infrastructure



Challenges & Strategies: Phasing

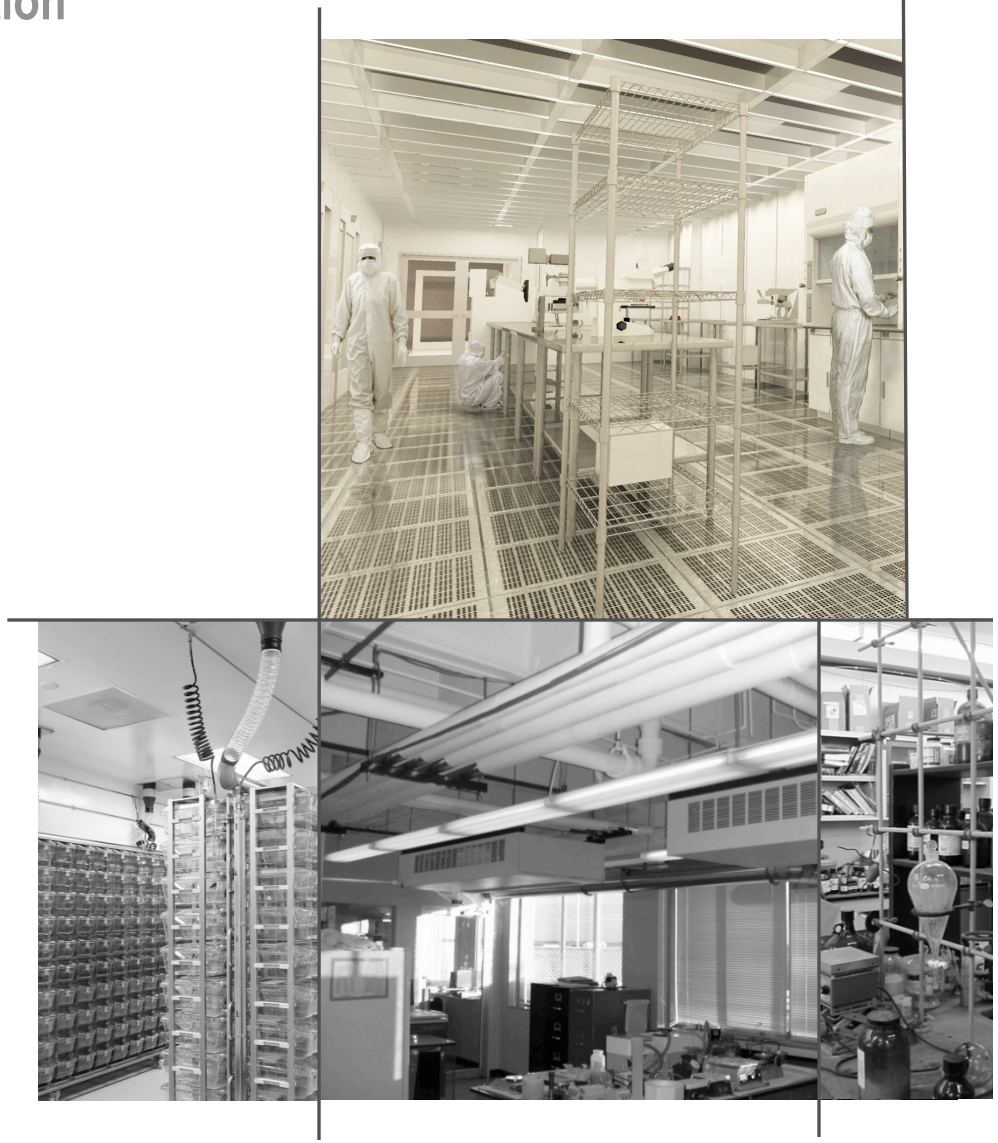
- Swing space / relocations
  - Maximum utilization of existing facilities means little space available for swing
  - More, smaller moves resulting from limited swing space means more phases, more time, more cost

Challenges & Strategies: Phasing

- Concurrent operations
  - Need to maintain critical research operations
  - Need to maintain functions not easily or economically duplicated elsewhere
  - Security, safety, logistics issues
- Managing research interruptions
  - Clear communication with facility users and other stakeholders
  - Planning efforts early in design process
  - Systems configured to facilitate cut-overs
  - Specialized documentation included in contract documents

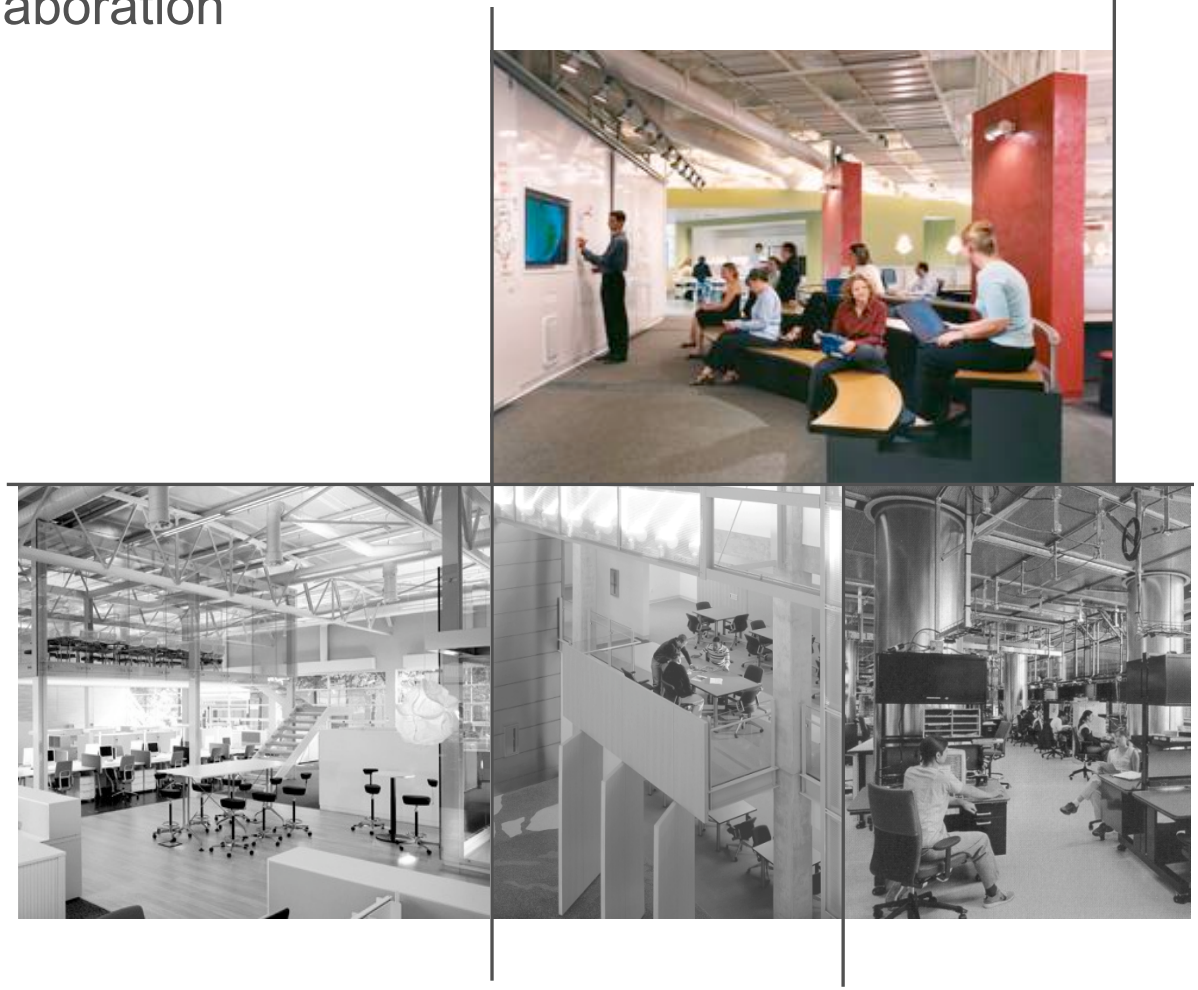
Opportunity: Optimize Functional Organization

- Create shared core lab facilities:
  - Cleanrooms
  - Characterization suites
  - Central refrigeration
  - Instrument processing
  - Measurement
  - Tissue culture
  - Imaging suites
  - Chemical storage

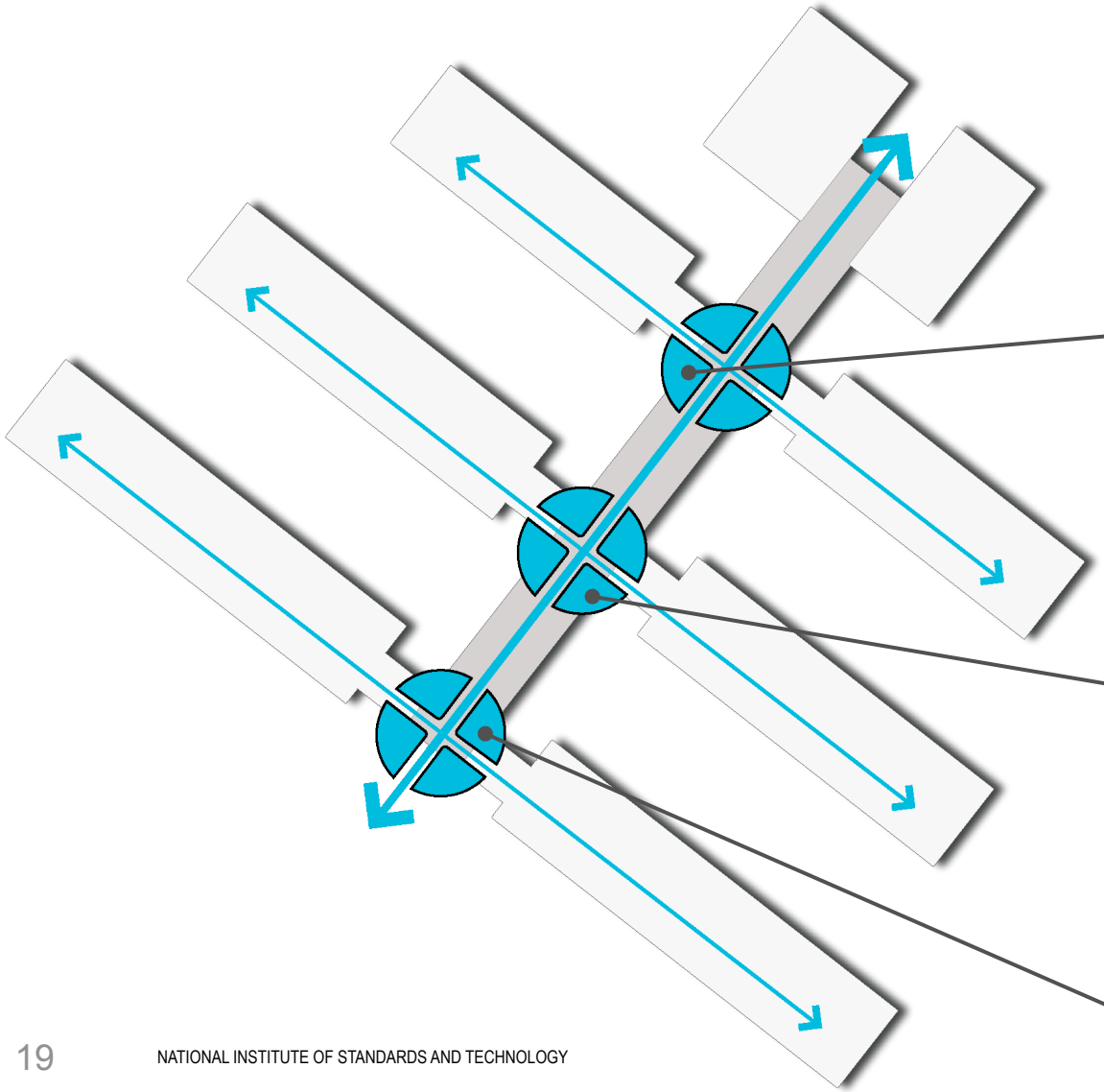


Opportunity: Optimize Functional Organization

- Organize to encourage collaboration
  - Within a discipline
  - Interdisciplinary

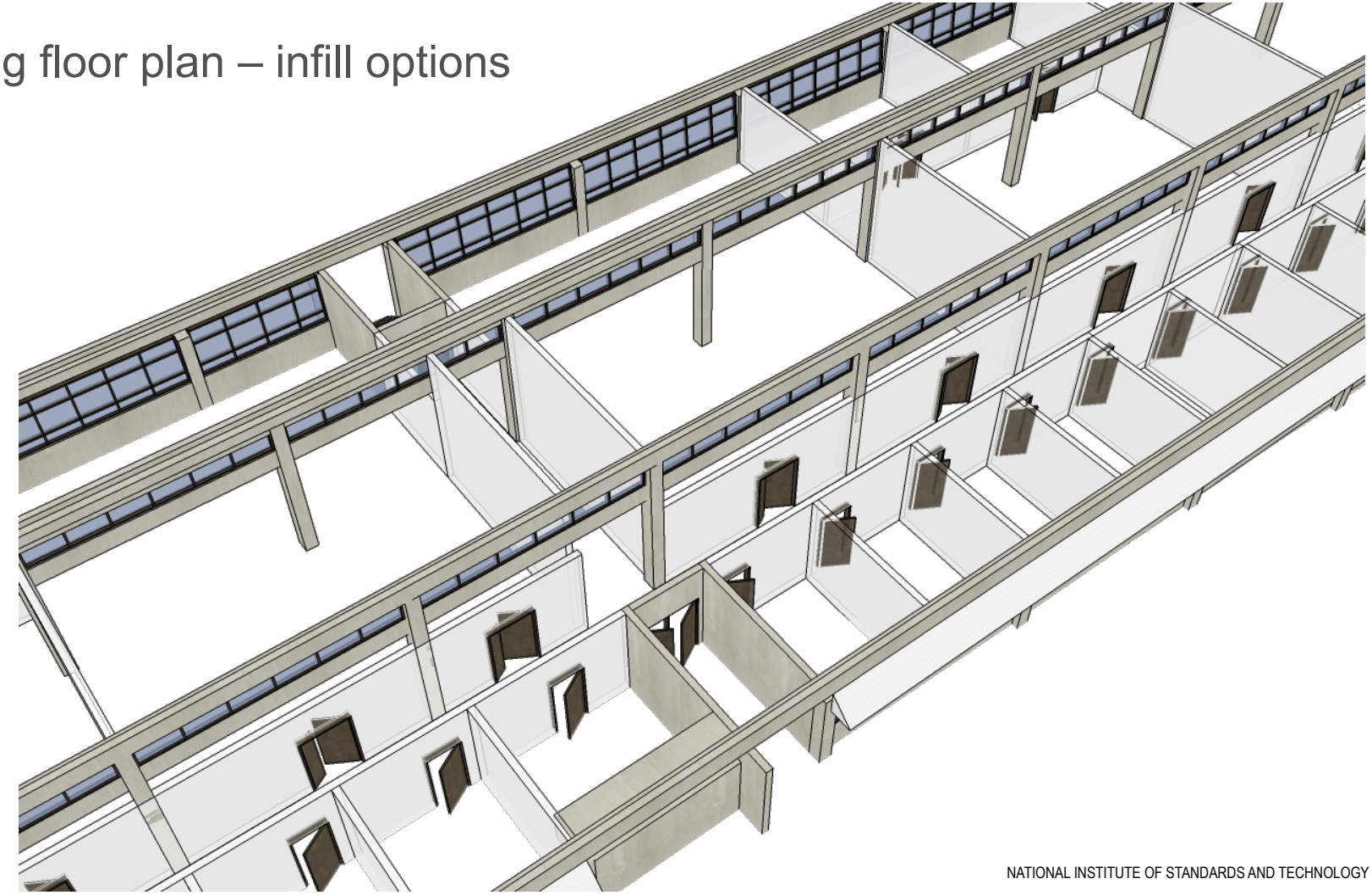


Opportunity: Collaboration



Opportunity: Collaboration

- Existing floor plan – infill options



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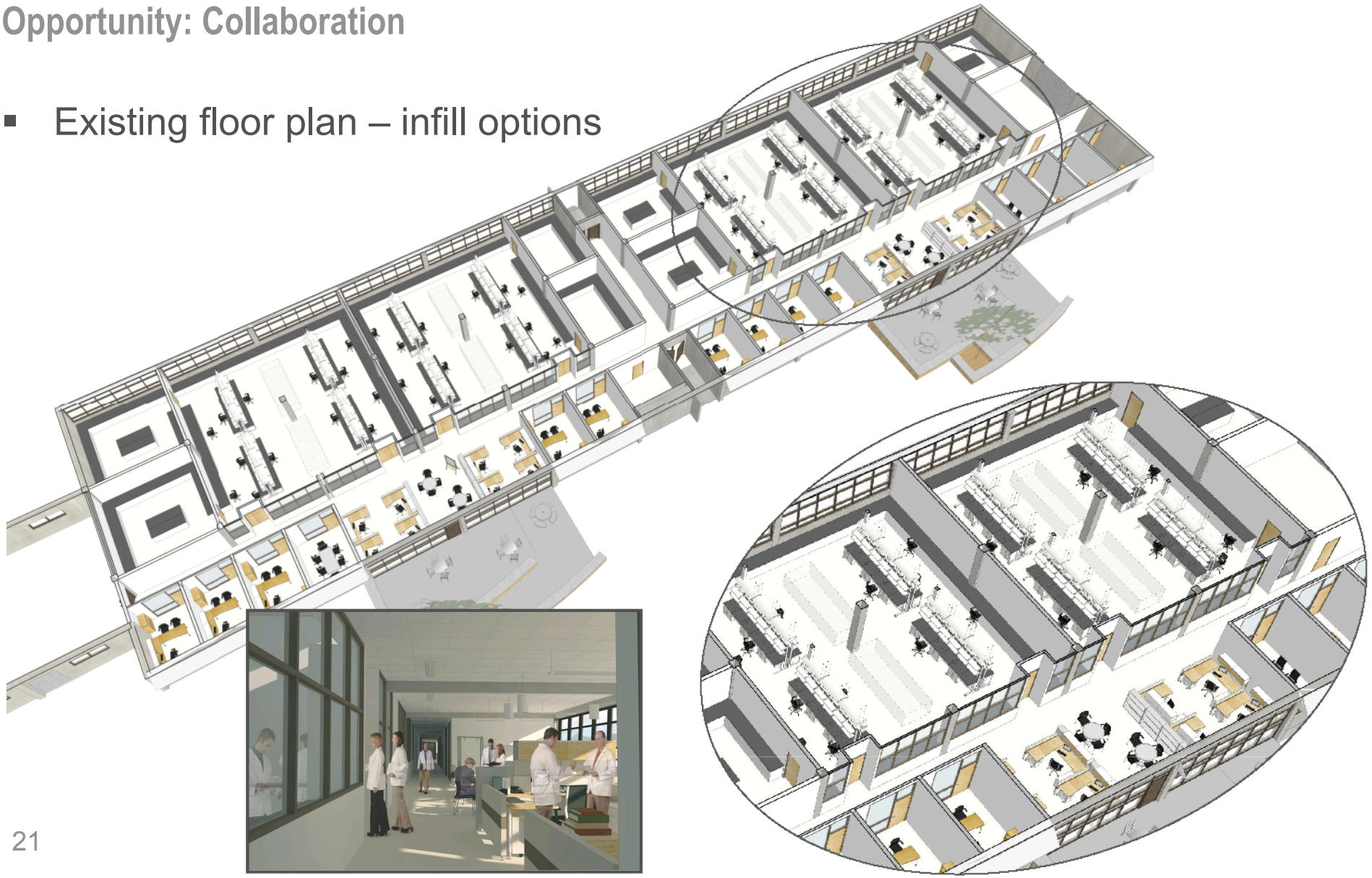
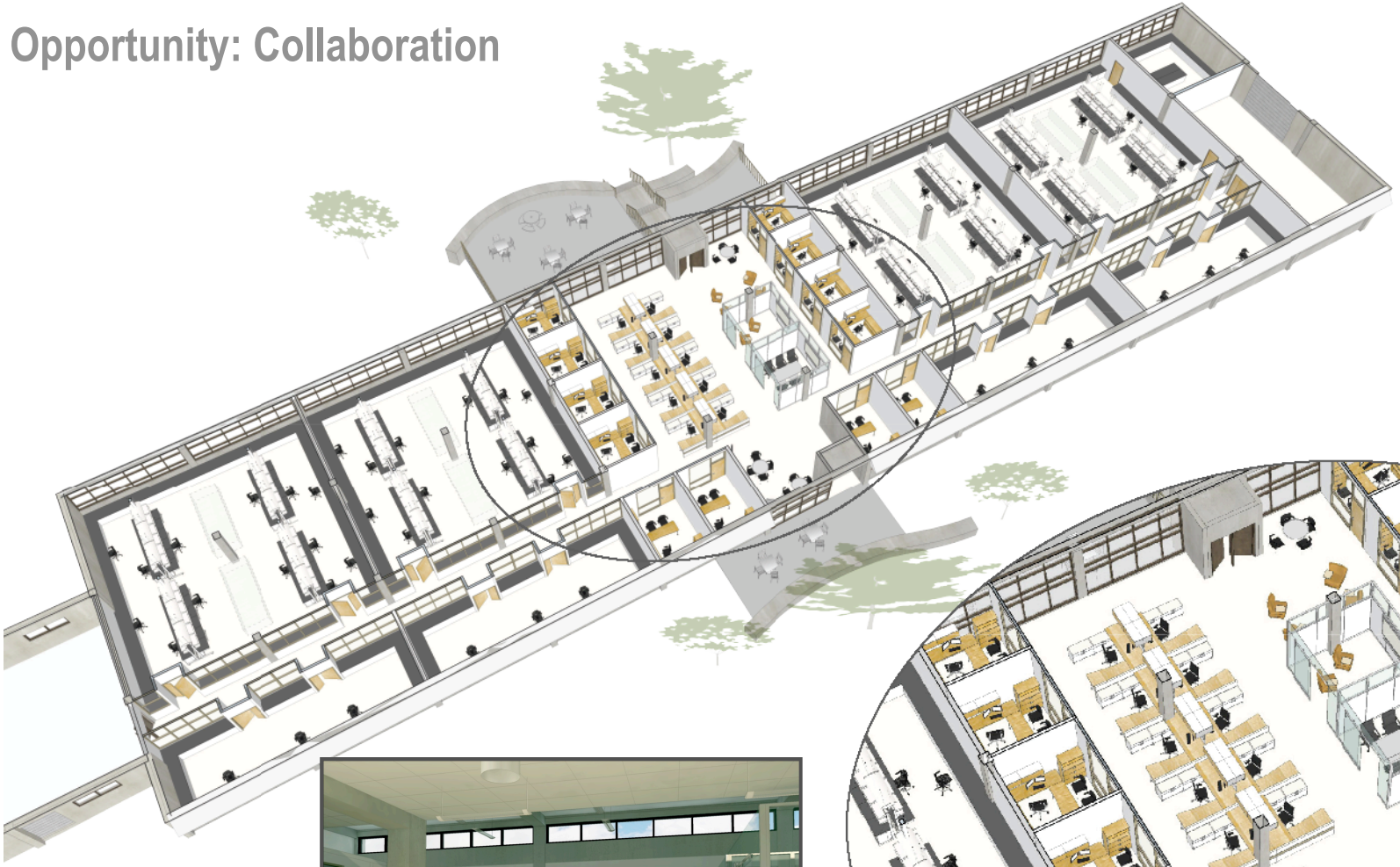


Opportunity: Collaboration



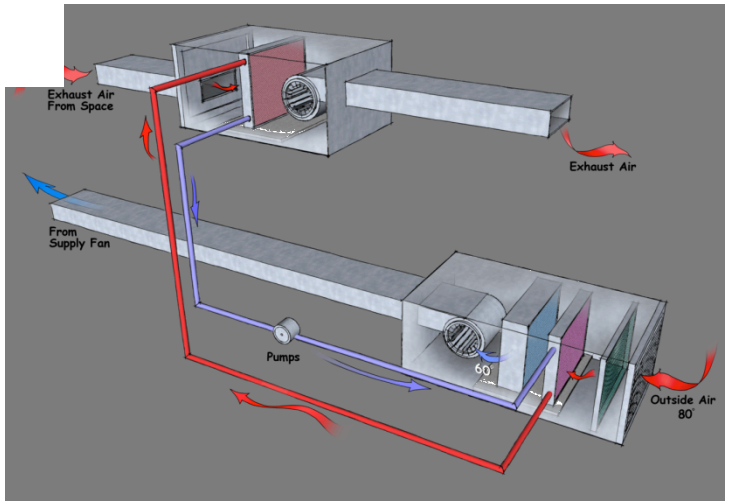
Opportunity: Enable Flexibility

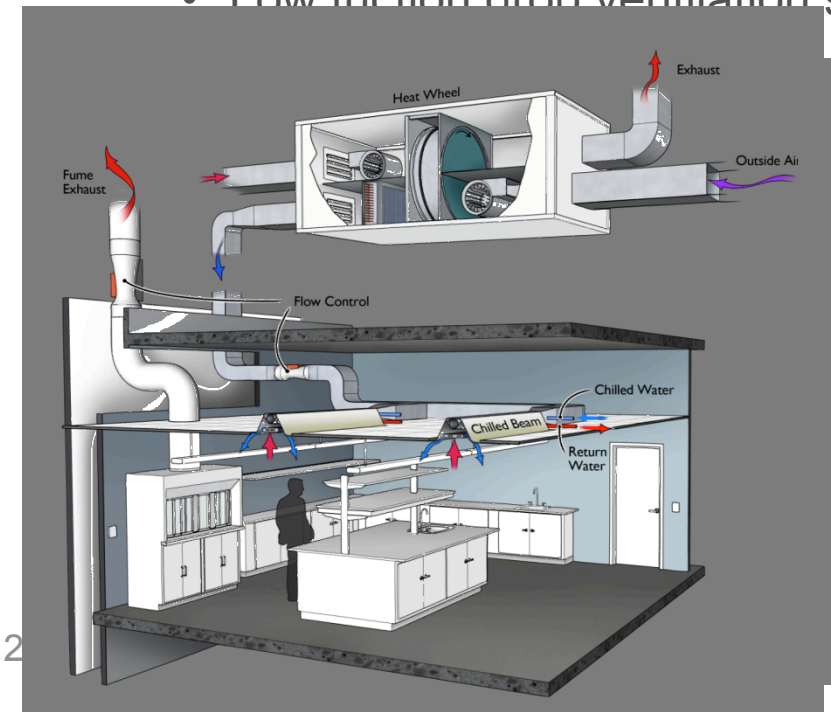
- Overhead utility distribution
- Moveable furniture
- Increased ceiling heights

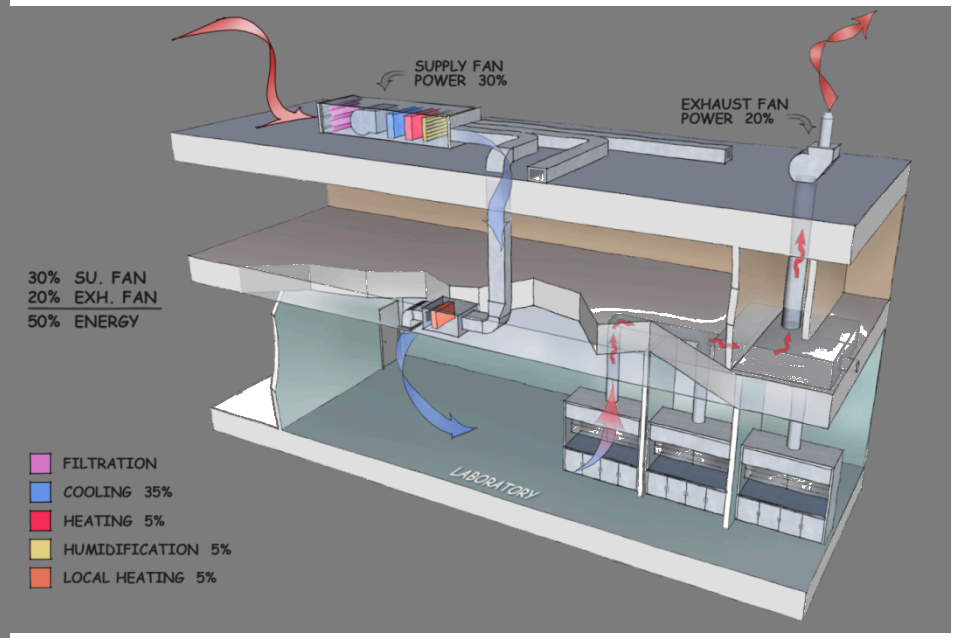
RENOVATING & REPURPOSING

Opportunity: Improve Energy Efficiency

- GOAL: Reduce energy consumption
  - High performance building envelope
  - Appropriate HVAC system
    - Energy recovery
    - Reduce fan energy
    - Low friction drop ventilation systems







Opportunity: Improve Energy Efficiency

- Revise operating policies
- Occupant behavior drives energy use

case studies:

observations / trends

project review

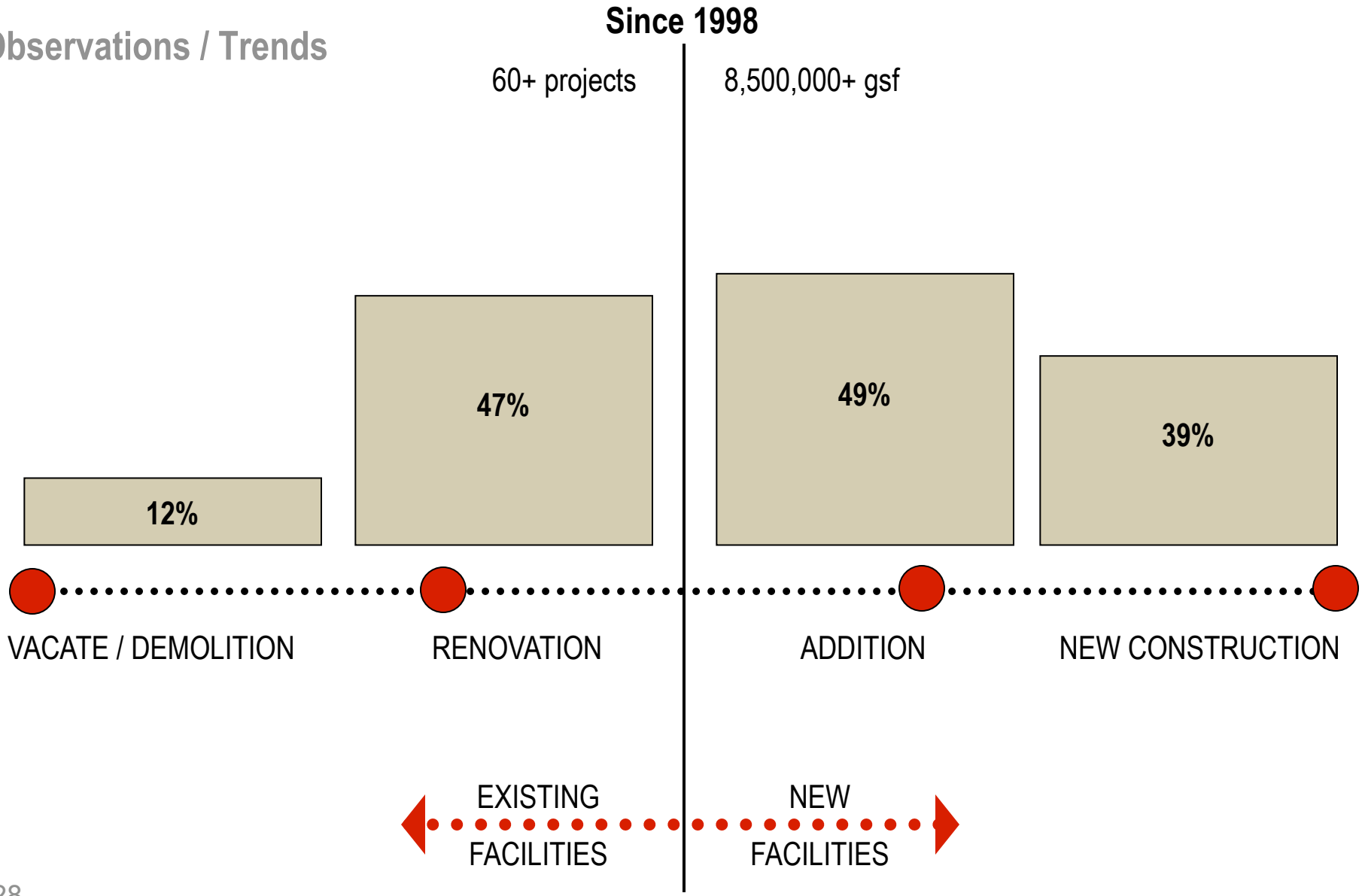
3

Observations / Trends

Successful Projects

- Preserve the campus' values of place
- Maximize new space consistent within the campus context
- Provide the best possible value for the Institution

Observations / Trends



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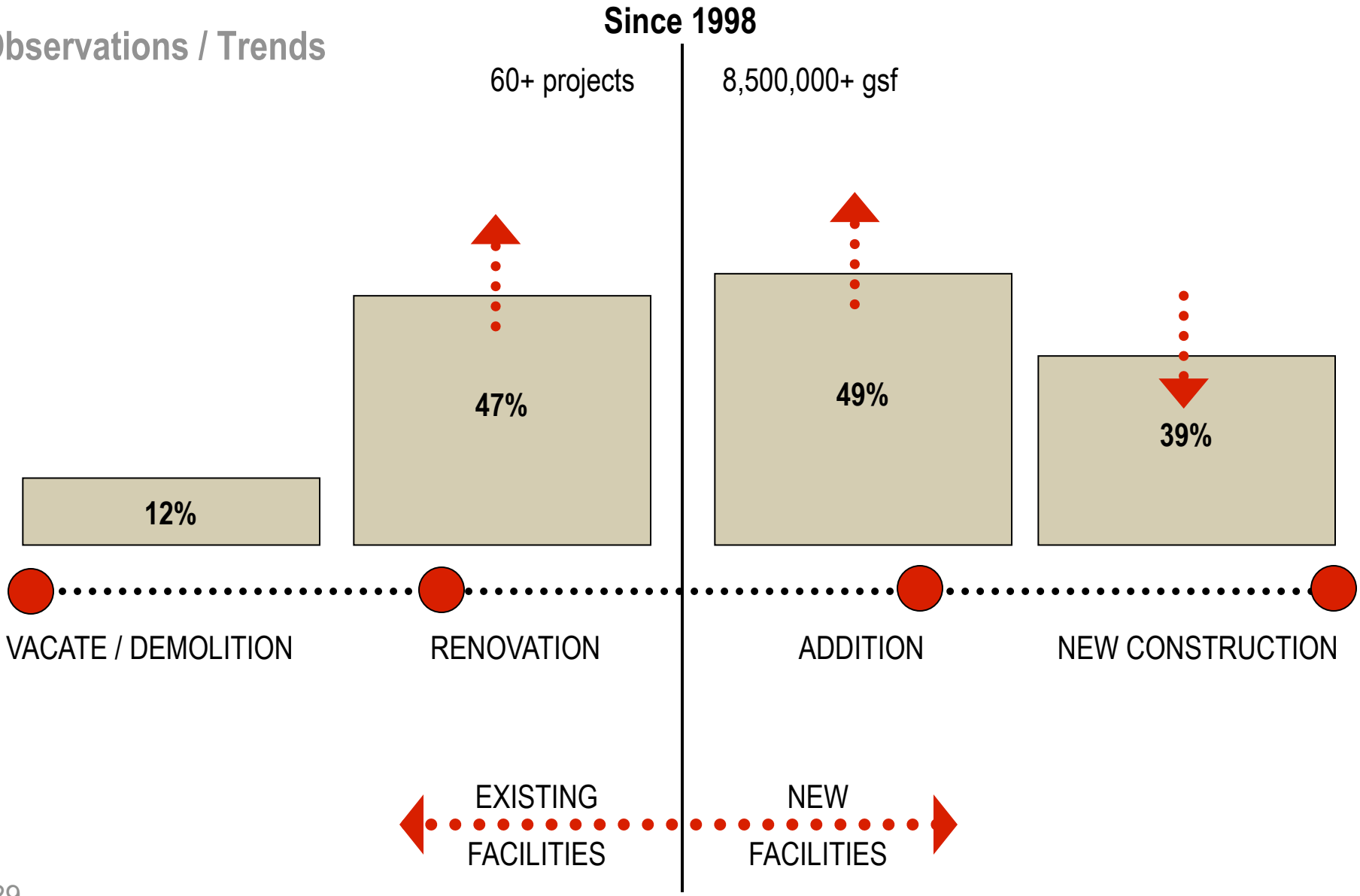
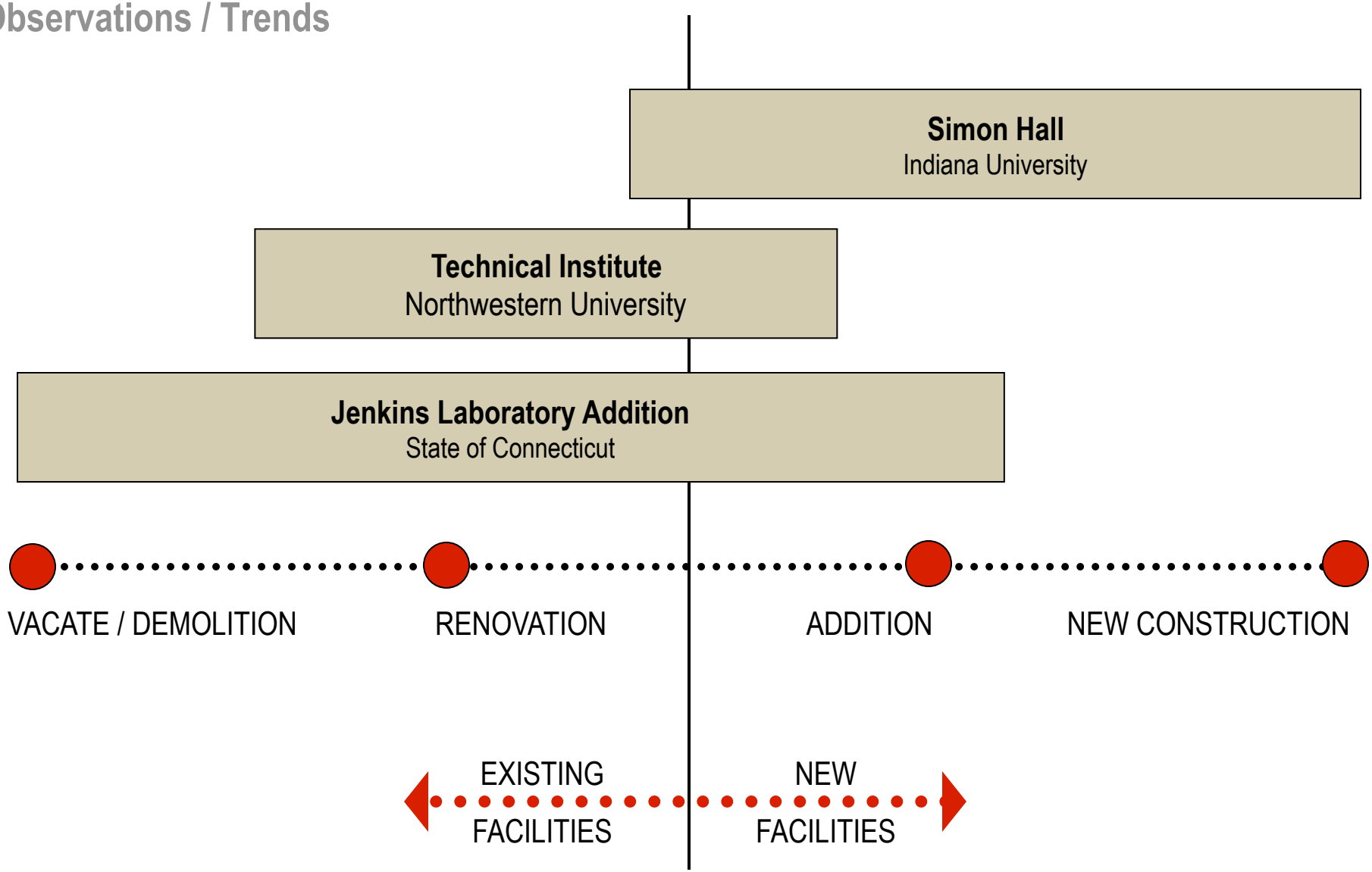
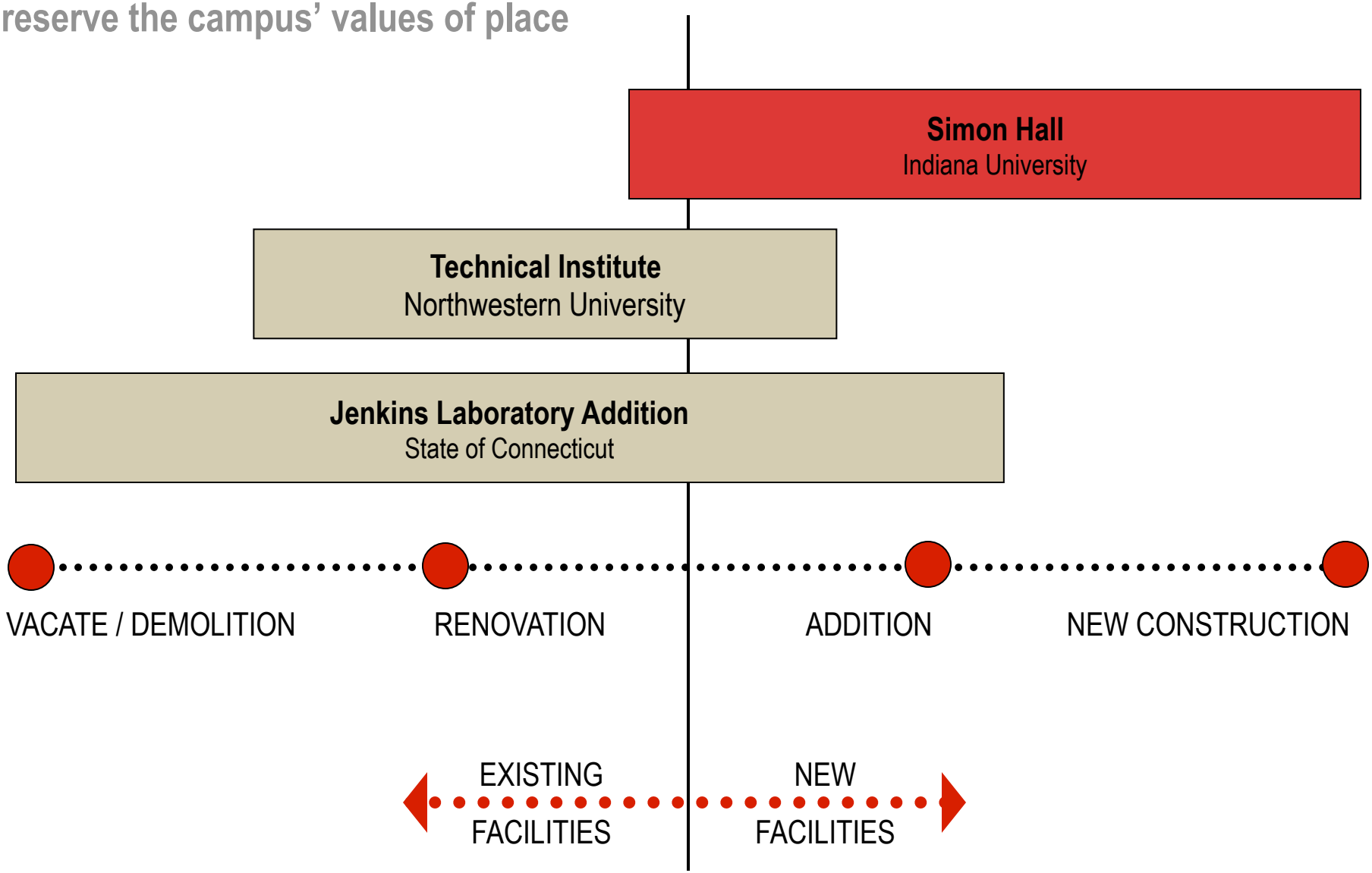


Observations / Trends



CASE STUDIES

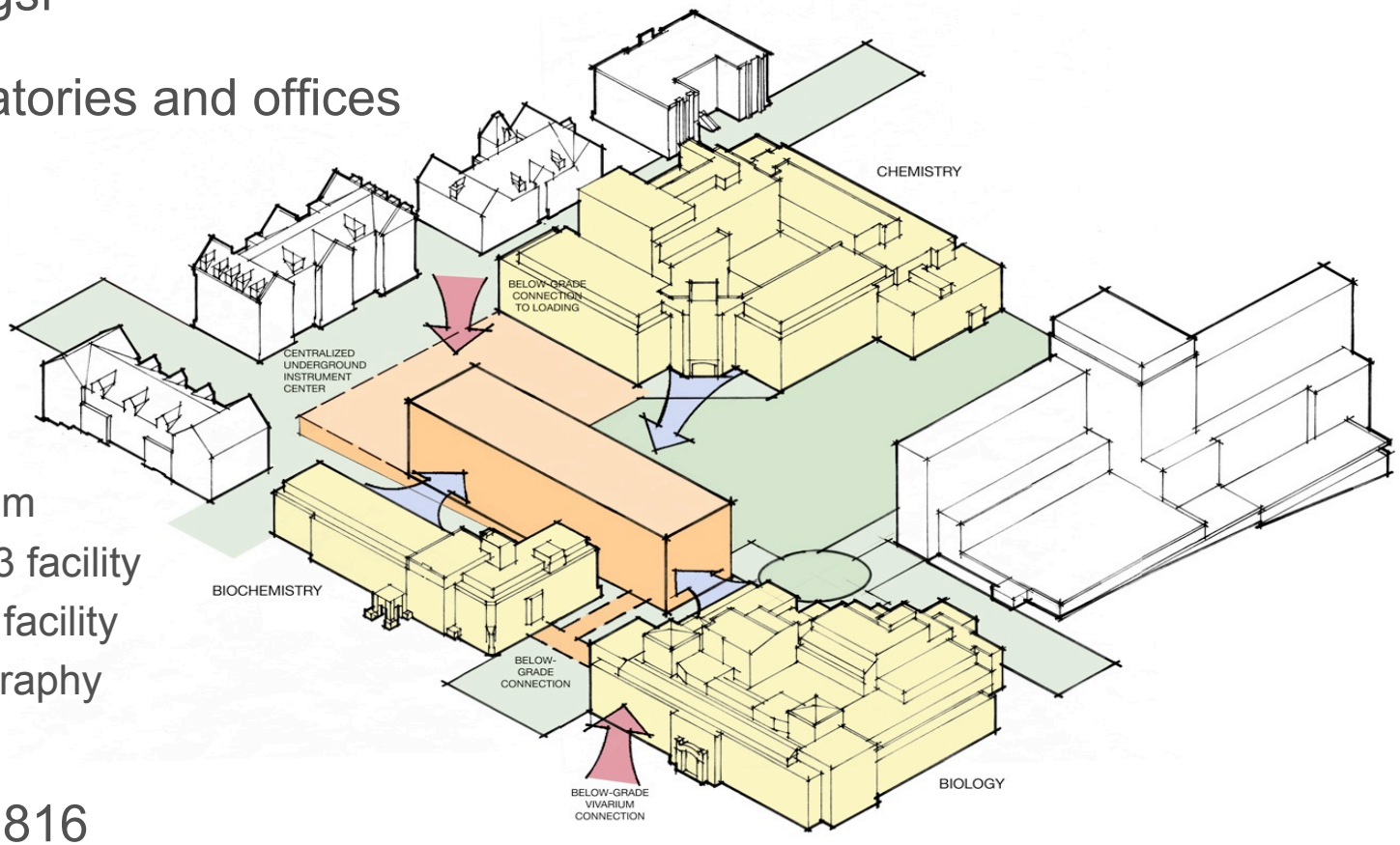
Preserve the campus' values of place



Project Review: Simon Hall, Indiana University

Project: 140,400 gsf

- Research laboratories and offices
  - Chemistry
  - Biology
  - Physics
  - Biochemistry
- Core facilities
  - ISO 6 clean room
  - Biosafety level 3 facility
  - High field NMR facility
  - X-ray crystallography



Budget: $ 46,647,816

Project Review: Simon Hall, Indiana University

- Objectives
  - Designed to fit seamlessly into the historic context of the campus
  - A literal and philosophical intersection of the chemistry, biology, and physics departments
  - Promote interdisciplinary research and teamwork within existing scientific departments
  - To accommodate continuously changing research needs
  - To maximize resources with highly specialized core facilities
  - Construct for longevity and efficiency with superior craftsmanship

Project Review: Simon Hall, Indiana University

"It would be impossible to overstate the importance of this new space. More space means more fruitful collaboration among brilliant minds within the College and our School of Medicine.

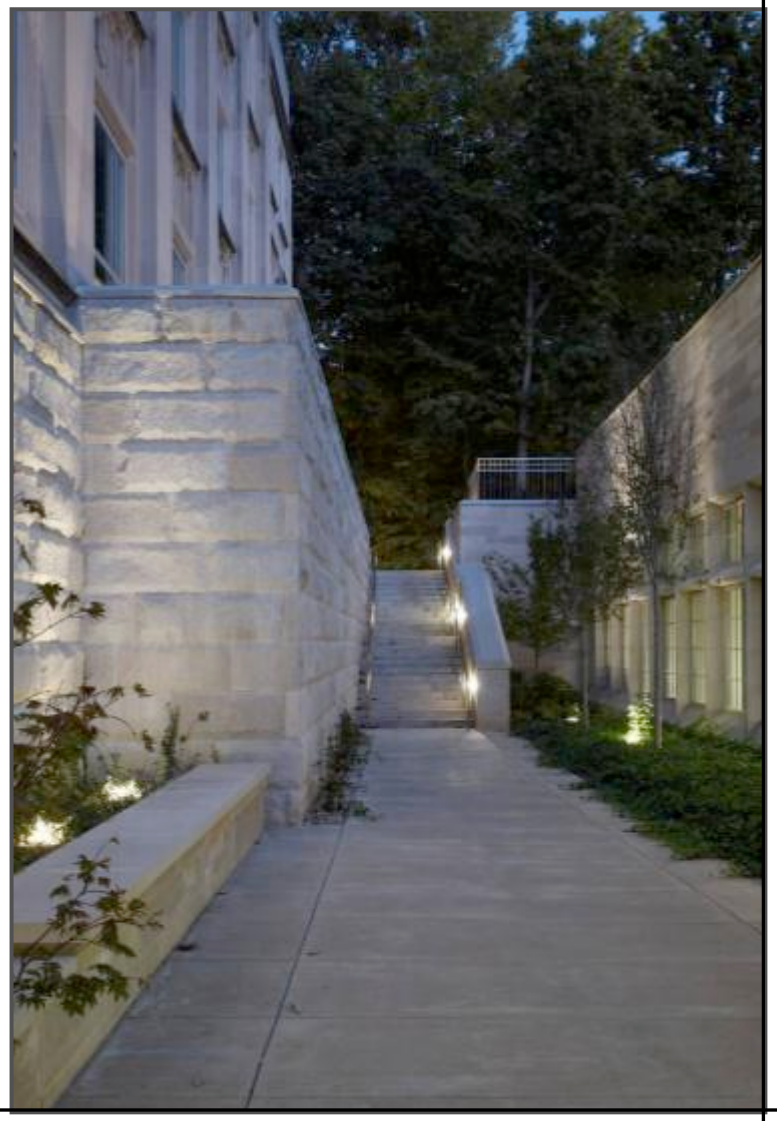
It fortifies our position as a life sciences leader."

Michael A. McRobbie, Indiana University President

Project Review: Simon Hall, Indiana University

Project Review: Simon Hall, Indiana University

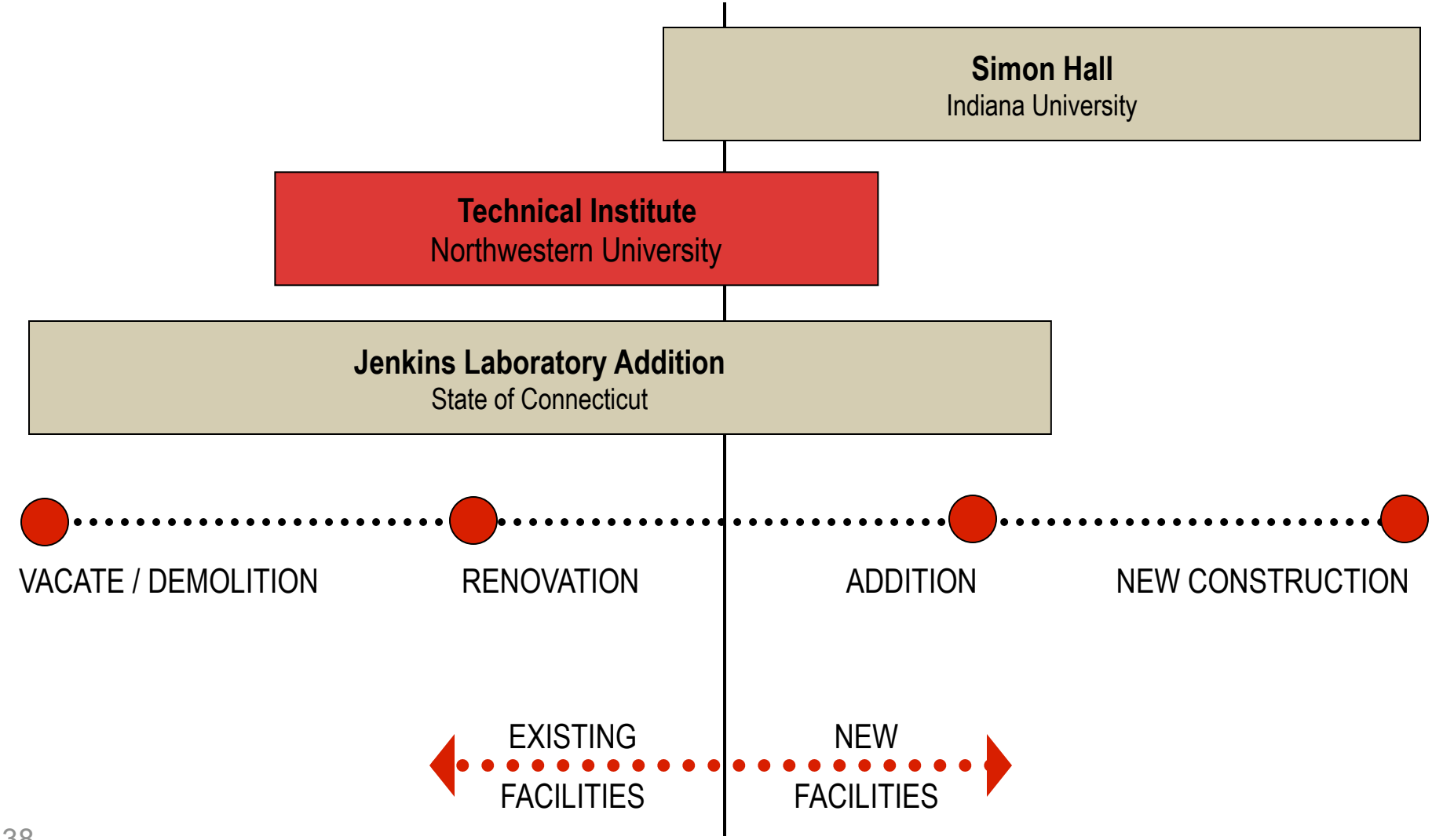
- Approximately 1/3 of the program space located below the ground plane while maintaining access to daylight
- Serviced by connections to existing Chemistry Building, Jordan and Myers Hall
- Future facility connections planned



Project Review: Simon Hall, Indiana University

- Reflects the traditional architectural heritage of Indiana University's campus
- Visual cues from Myers Hall, a 1930s *art moderne* building which housed the medical school
- Echoing Myers Hall's isolated symmetry and works in unison to complete it

Maximize new space consistent within the campus context



Project Review: Technological Institute Infill, Northwestern University

Project: 100,000 gsf

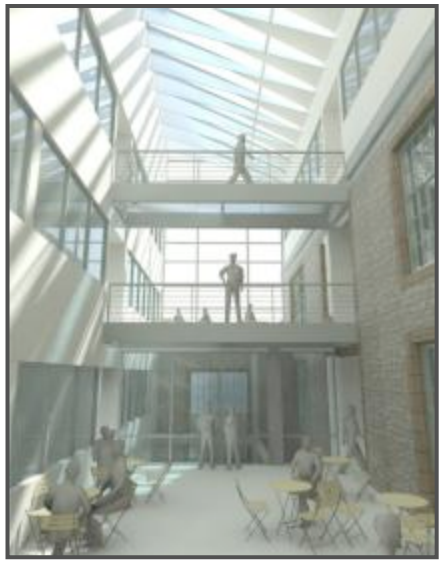
- Integrated Molecular Structure Education and Research Center (IMSERC)
- ISO 5-6 clean room
- Research laboratories and offices
  - Generic
  - Engineering life science program

Budget: $ 72,000,000

Existing Facility	800,000 gsf
Wings B-C Infill	50,000 gsf
Wings F-G Infill	50,000 gsf

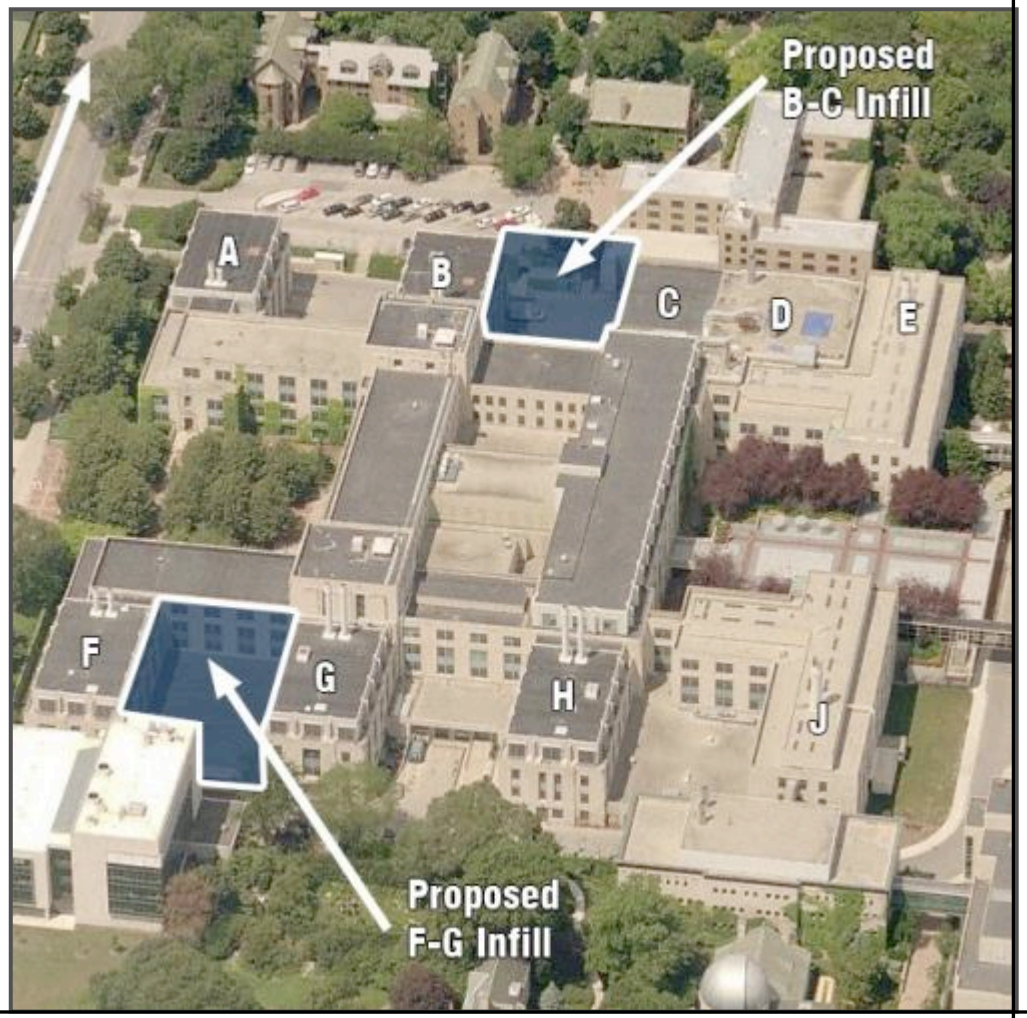
Project Review: Technological Institute Infill, Northwestern University

- Objectives
  - To integrate and showcase advanced teaching and research facilities for rapidly changing technologies (IMSERC and clean room)
  - Provide adaptable environments to retain and attract the best faculty
  - Provide maximum utilization of available site
  - Create a model for future expansion and development
  - Provide daylight to all faculty offices
  - Maximize existing proximities and resources
  - Meet the USGBC's LEED requirements for Silver certification
  - Maintain use of existing functions – before, during and after



Project Review: Technological Institute Infill, Northwestern University

- Code implications
- Daylighting for all faculty offices
- Building and campus infrastructure
- Structural design
  - How close?
  - How deep?
- Construction logistics
- Construction disruptions



Project Review: Technological Institute Infill, Northwestern University

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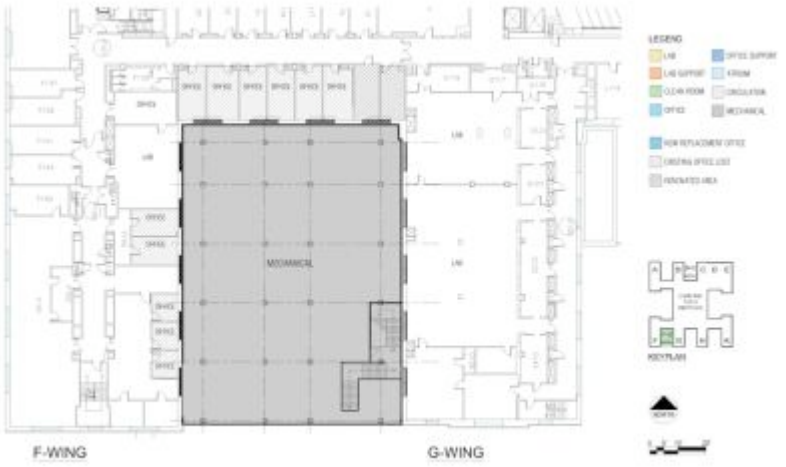
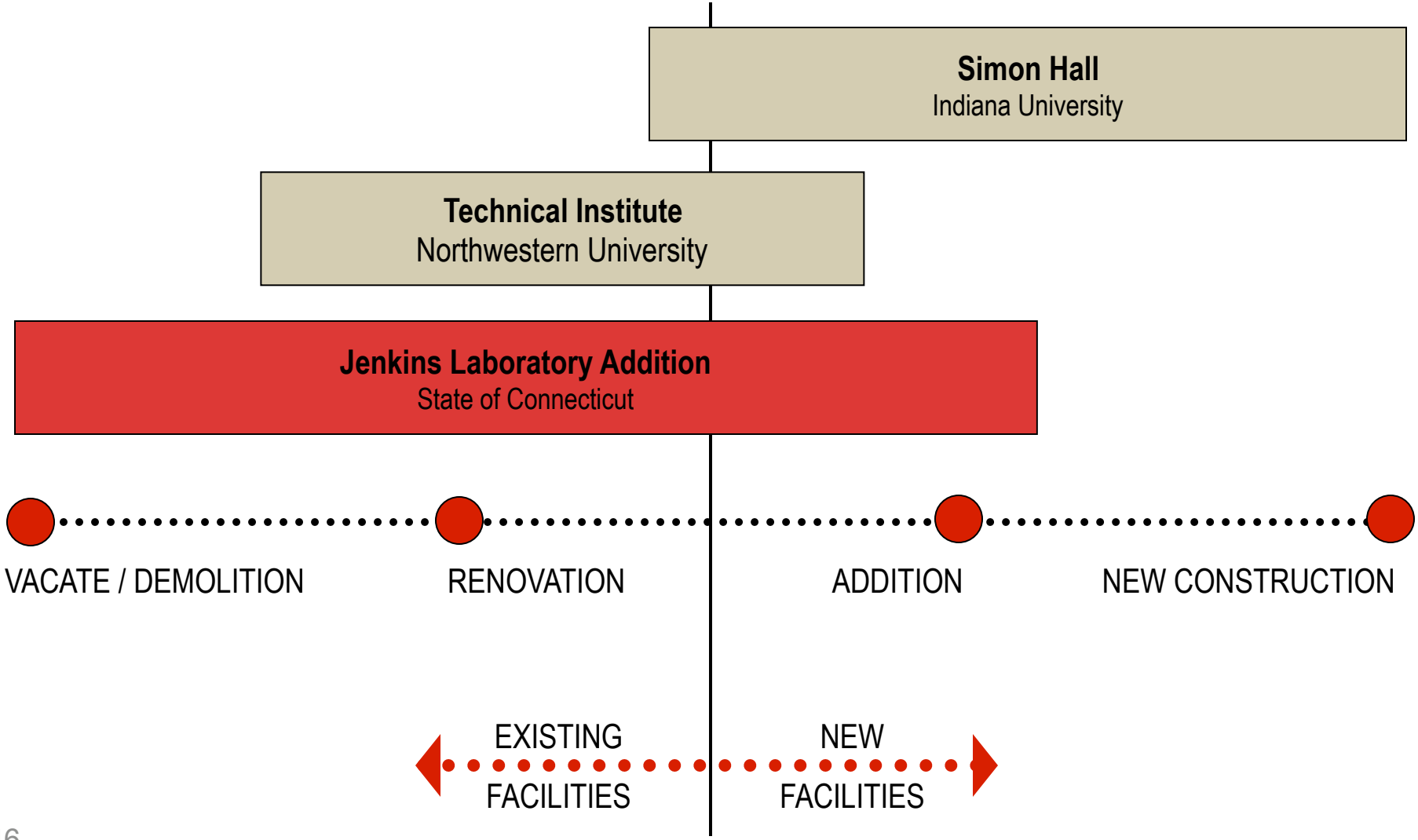


Project Review: Technological Institute Infill, Northwestern University

- Maximization of space for growth and new programs
- Construction manager
  - Logistics
  - Sequencing
  - Phased implementation plan
- Atrium for internal daylighting and public space
- Views into IMSERC and clean room

Project Review: Technological Institute Infill, Northwestern University

Provide the best possible value for the institution



Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station

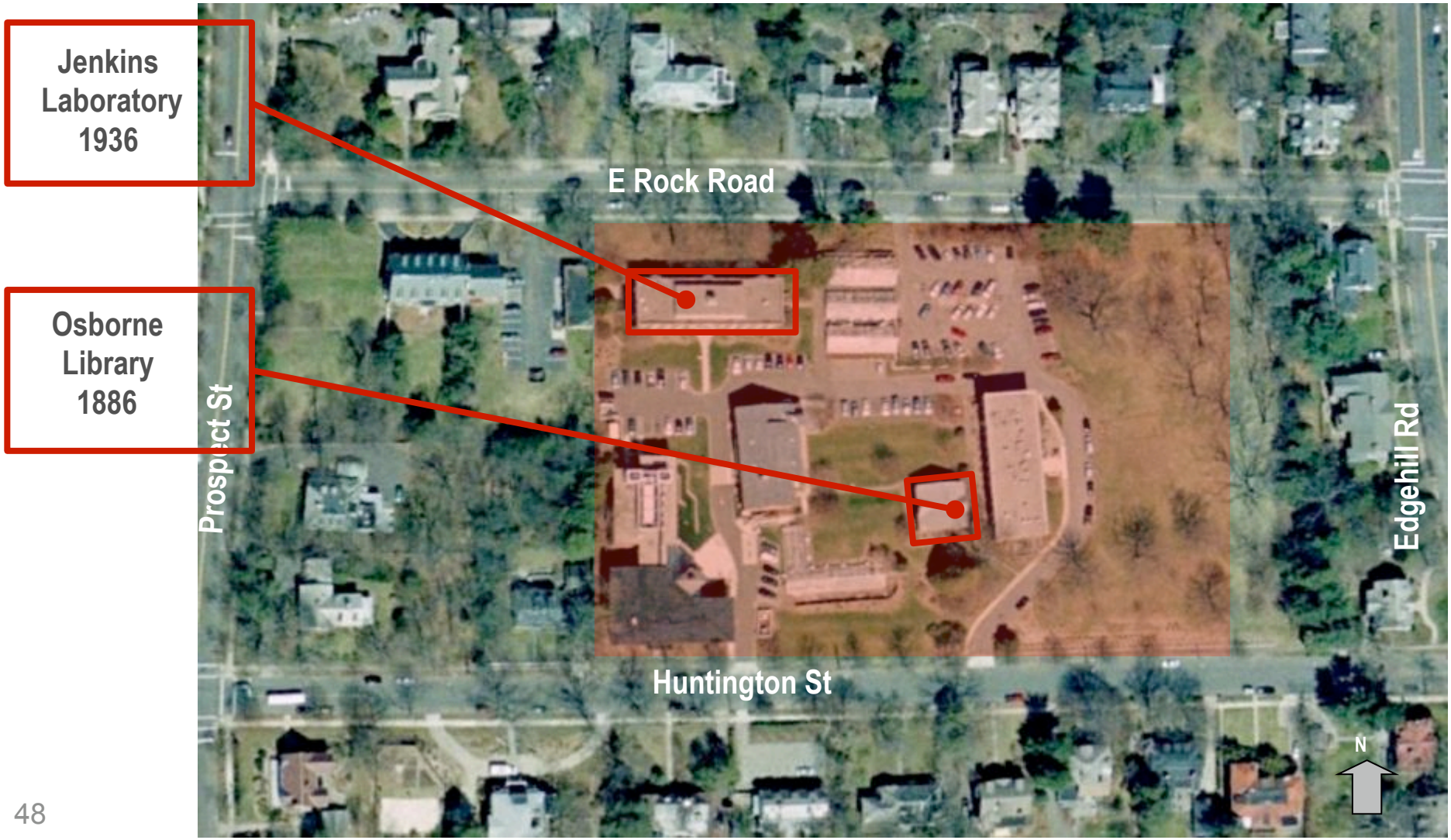
Project: 27,000 gsf

- Research and testing laboratories with associated offices
  - Plant pathology
  - Entomology
  - Environmental sciences
- Instructional facilities
  - Lecture / seminar
  - Public interface laboratories
  - Library and display
- Administrative offices

Budget: $ 10,000,000

New Construction	12,500 gsf
Historical Renovation	14,500 gsf

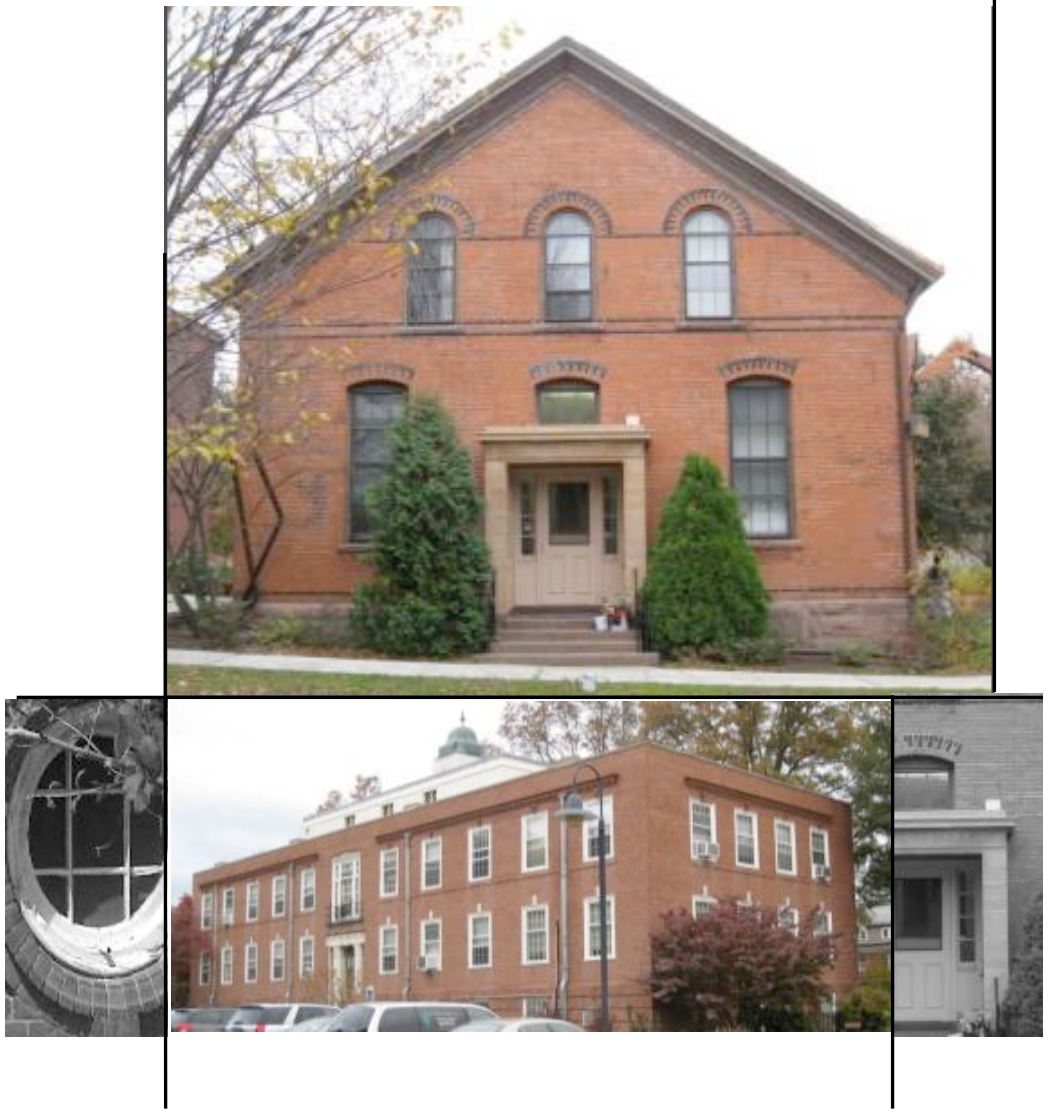
Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station



Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station

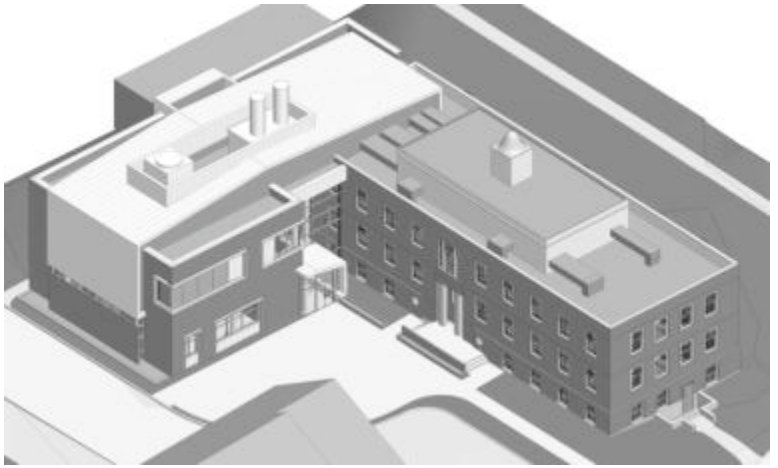
Historic Context

- To put science to work for society as the State investigates plants and their pests, insects, soil and water
- First research and testing facility in the country (1882) – currently repurposed into a library
- Jenkins Laboratory was built in 1936
- CAES campus was designated a Registered National Historic Landmark in 1964

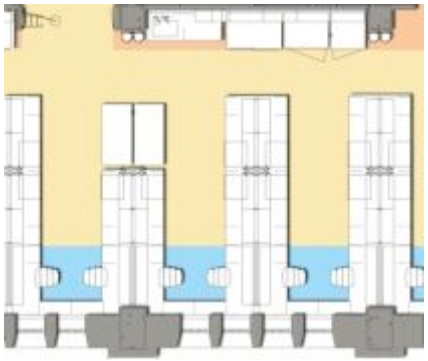


Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station

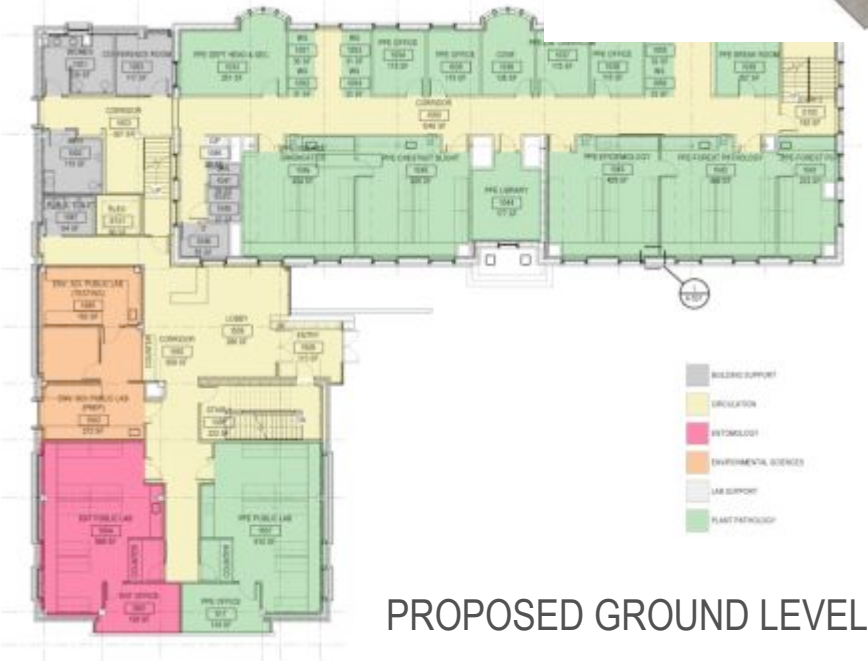
- Objectives
  - Maximize utilization of existing facilities
  - To optimize spaces and functions for two similar departments
  - Provide connectivity to all departmental facilities
  - Develop community spaces for public and group activities
  - Provide state of the art research spaces and a modern addition to create a new image to the public
  - Reinforce historic significance of the departments and State agency



Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station



PLANNING FOR FLEXIBILITY



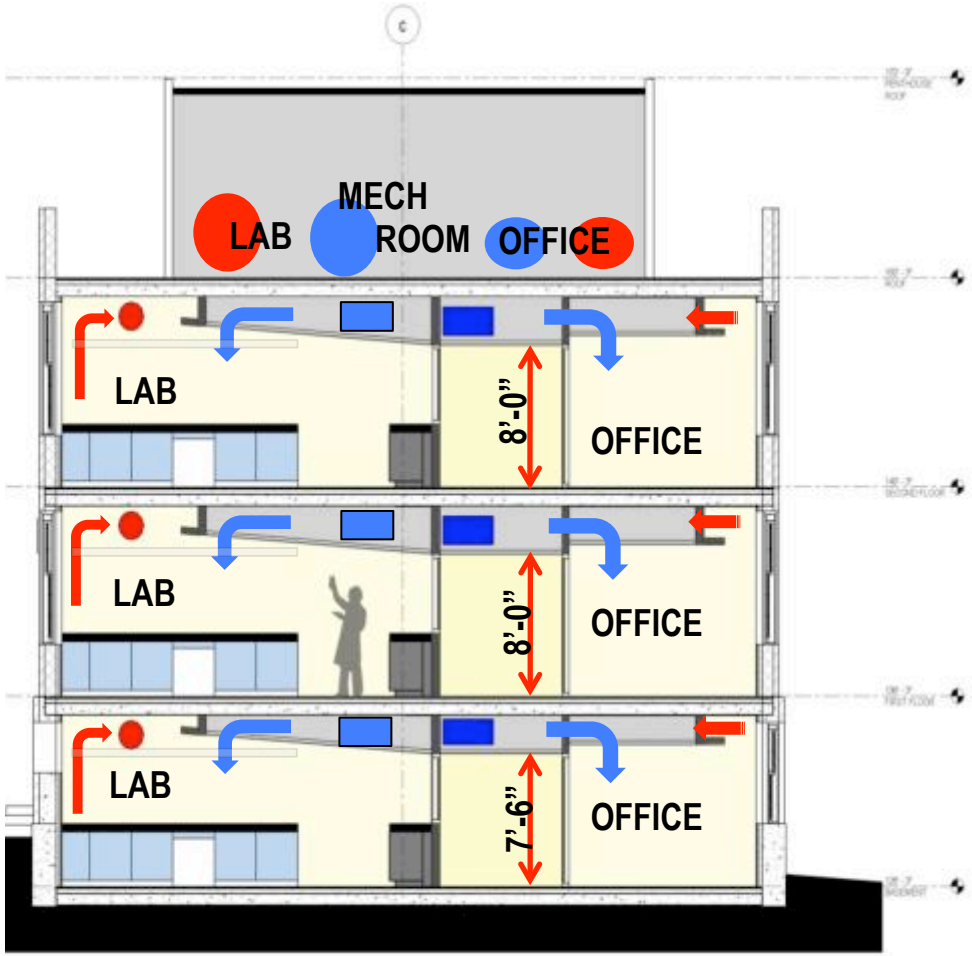
PROPOSED GROUND LEVEL

PROPOSED UPPER LEVEL

Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station

Obstacles

- Floor to floor height of existing facility
- Temporary use relocation / ‘swing space’:
  - Several research groups
  - Special research units
  - Maintain public access
- Identification of elements which best fit within renovated historic structures
- Maintain functionality throughout project
- Create a modern addition to a historic structure



Project Review: Jenkins-Waggoner Laboratory, Conn Agricultural Experiment Station

Challenges Bring Opportunities

- Clear delineation between public spaces and research spaces
- Embracing historical significance of the facility
  - Faculty meeting room
  - Reading room
  - Reuse of materials
- Activation of public plaza
  - Water filtration
  - Delineated shade areas

SUMMARY

Preserve the campus' values of place

Reflects the longevity of the campus heritage through detailing and reinforcement of campus pathways and outdoor spaces

Flad Architects

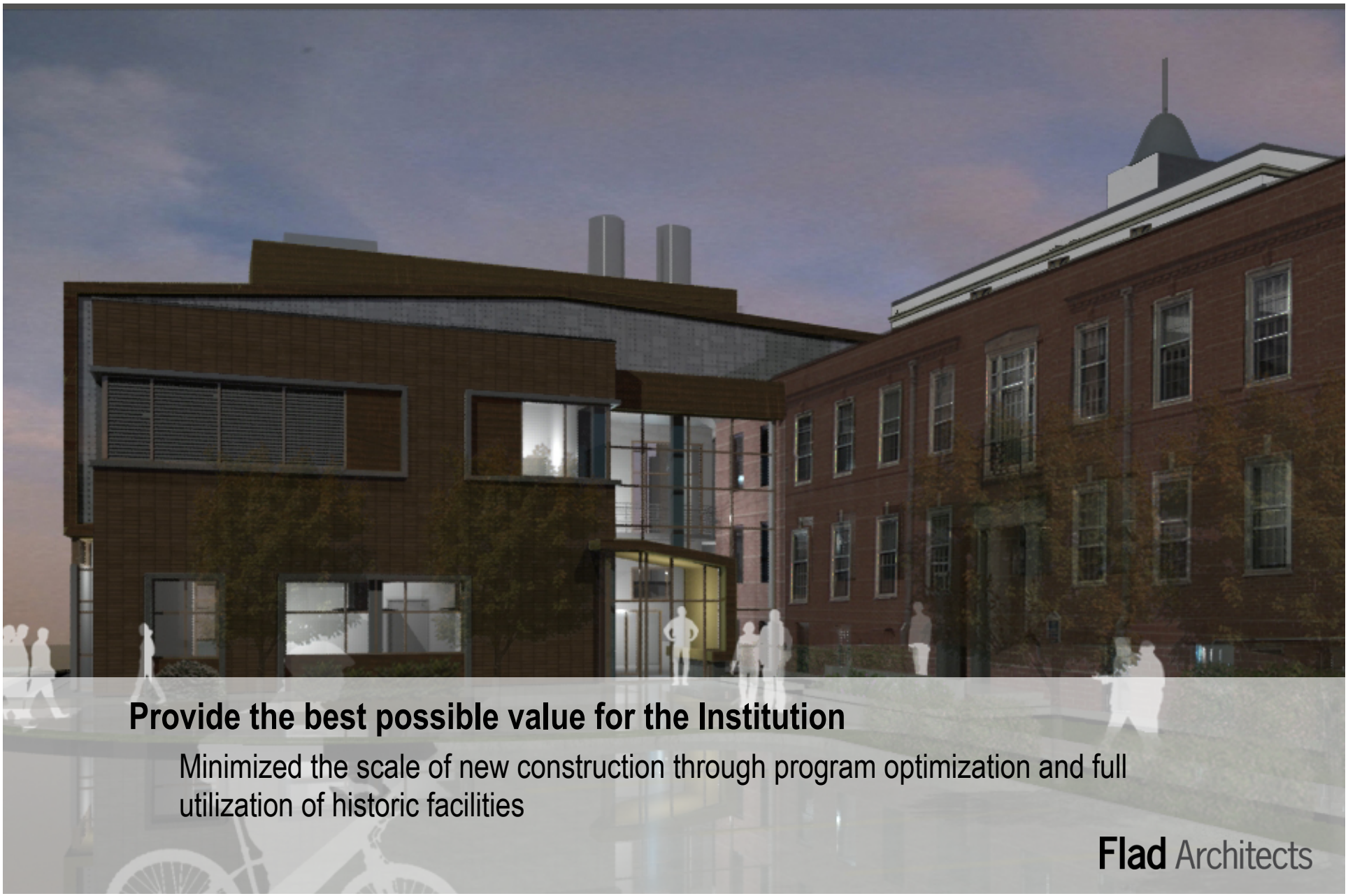
SUMMARY

Maximize new space consistent within campus context

Created highest practical development within existing footprint

Flad Architects

SUMMARY



Provide the best possible value for the Institution

Minimized the scale of new construction through program optimization and full utilization of historic facilities

Flad Architects

questions

&

discussion