Yale

# Physical Sciences and Engineering Building

Town Hall

February 25, 2020

# The Opportunity

**Program for the Physical Science and Engineering Building (PSEB)**

- Intellectual hub for the Quantum Science, Engineering and Materials initiative (USSC)
- Expansion of an Instrument Creation Center (USSC)
- Goal of opening building in 2026
- Expanded and upgraded core facilities
- Space to accommodate approximately 45 faculty and research labs
- Anticipate faculty from Applied Physics, CEE, CS, EE,, MEMS and Physics

# PSEB Site Selection

A. **North end of Science Hill**
- Biggest and fastest
- Accommodates near-term and longer-term development (up to ~900K GSF, include site B)
- Low-vibration areas due to bedrock
- Enhanced service and pedestrian connectivity within Science Hill
- Relocation of program to PSEB creates backfill opportunity in lower Hillhouse.

B. **Whitney Avenue**
- Site does not offer low-vibration area due to high water table
- Development is limited to ~290K GSF

C. **Lower Hillhouse**
- Requires 8-10 years due to site prep
- Significant enabling costs
- Development is limited to ~ 350K GSF with no future expansion

CAMPUS MAP


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# The Opportunity

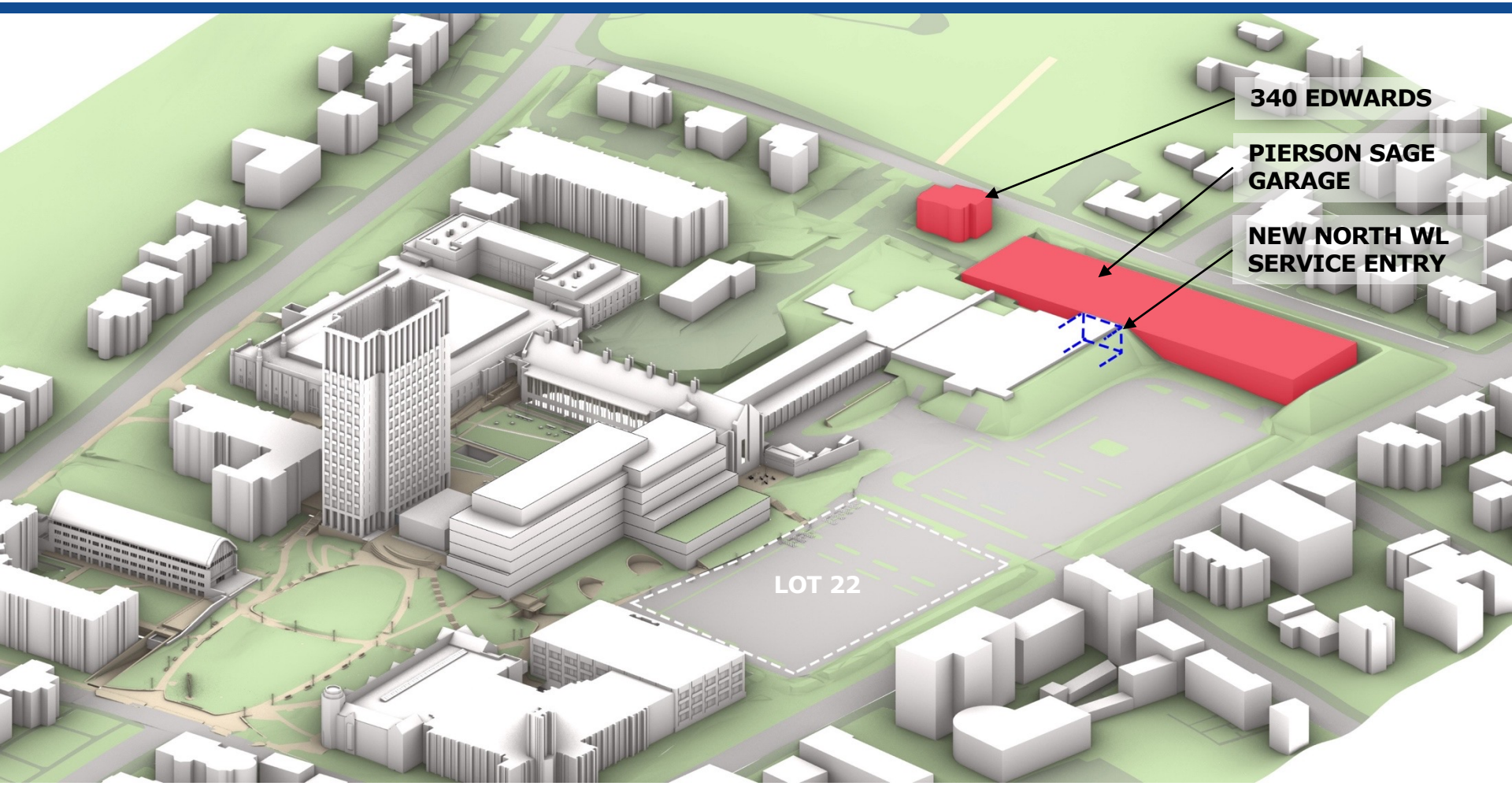
## The Physical Science and Engineering Building

- North end of Science Hill
  - Connectivity to other science buildings
  - Replacing Wright Lab – West

- 370K gross sqft (GSF)
  - WL-W replacement (42K)
  - CSB replacement and service nodes (39K)
  - Mechanical penthouse (31K)
  - **Net increase in research space PSEB (258K)**
    - **258K GSF is approximately 147K assignable sq ft (ASF)**

- Includes ~70K GSF (~40K ASF) on bedrock (low vibration)

# Enabling Projects

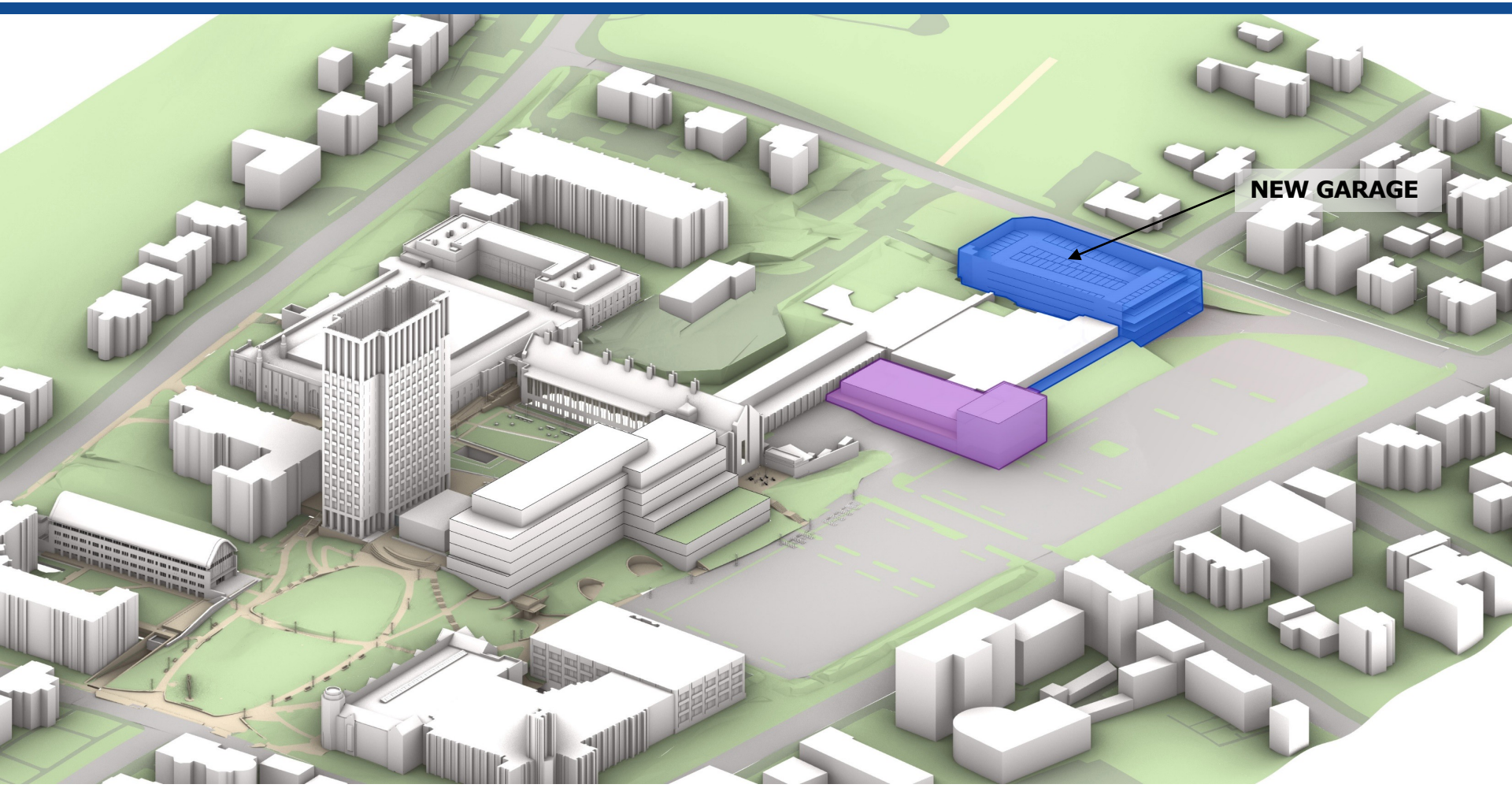



- Demolish Pierson Sage Parking Garage (relocate parking to Lot 22 and other Science Hill lots).
- Build new north WL service entry.
- Remove 340 Edwards

# Enabling Projects

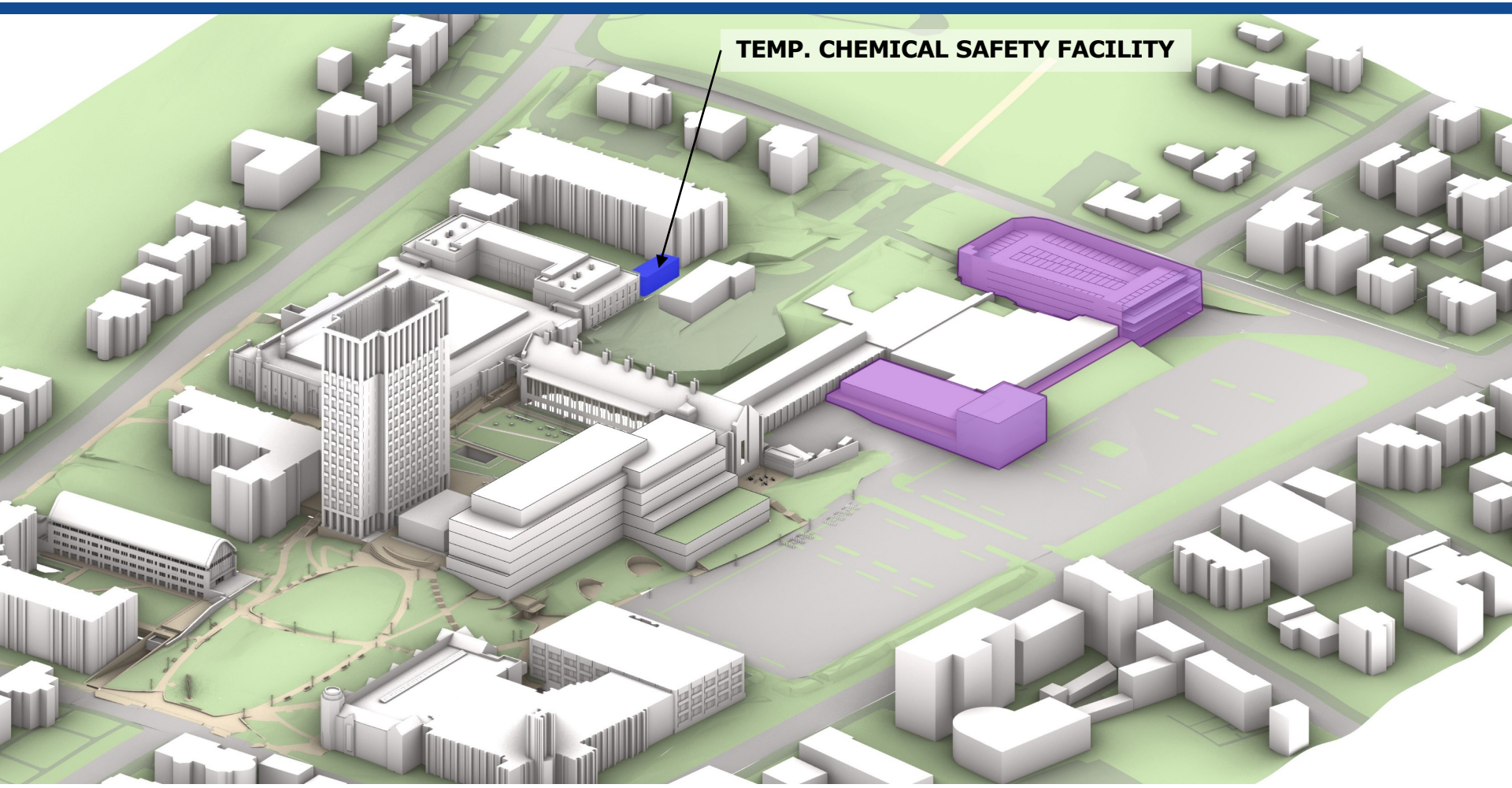

- Build south addition to WL.

# Enabling Projects



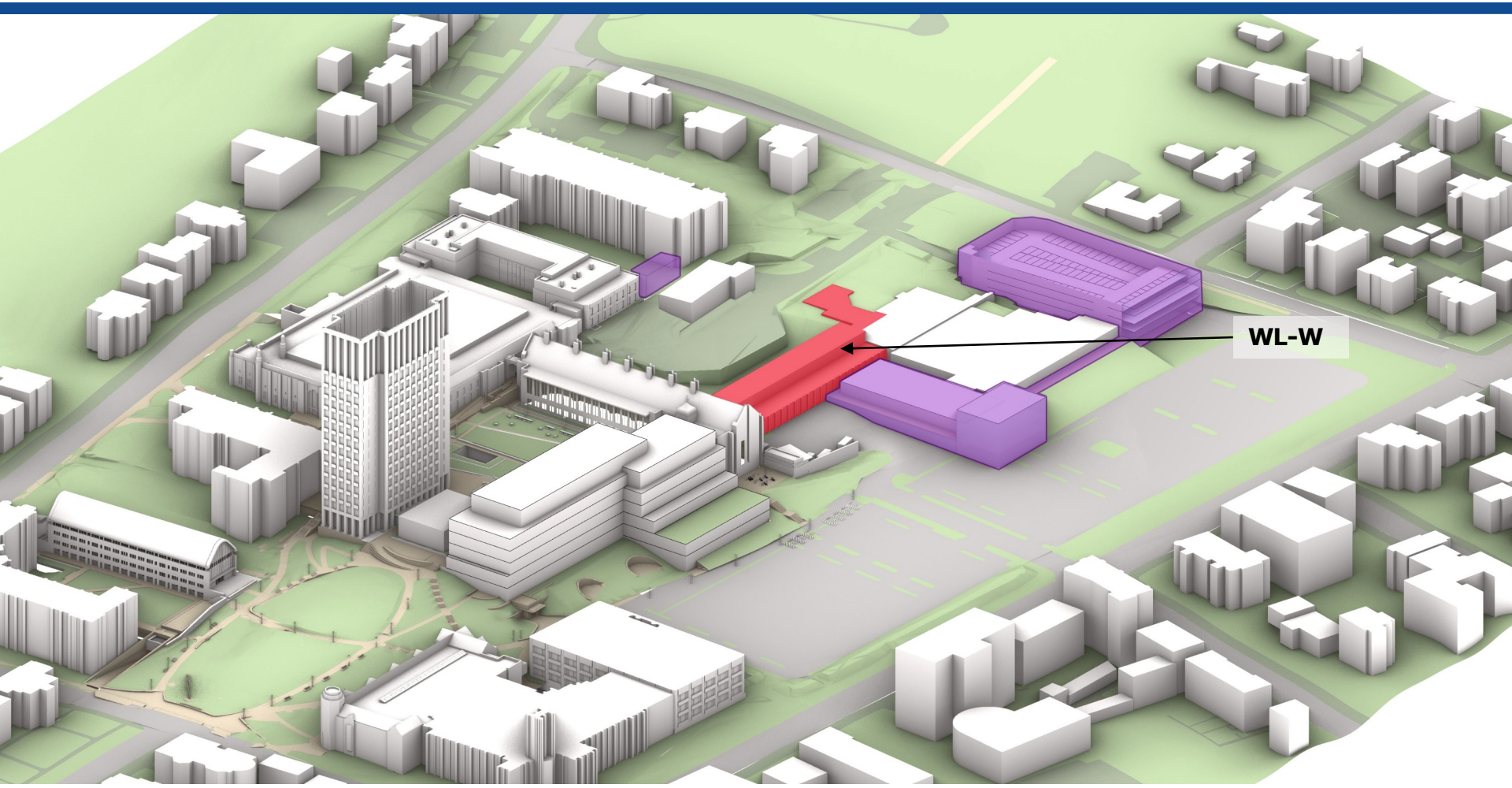

- Build new garage north of WL.

# Enabling Projects




- Create temporary chemical safety facility.

# Enabling Projects




- Demolish WL-W.



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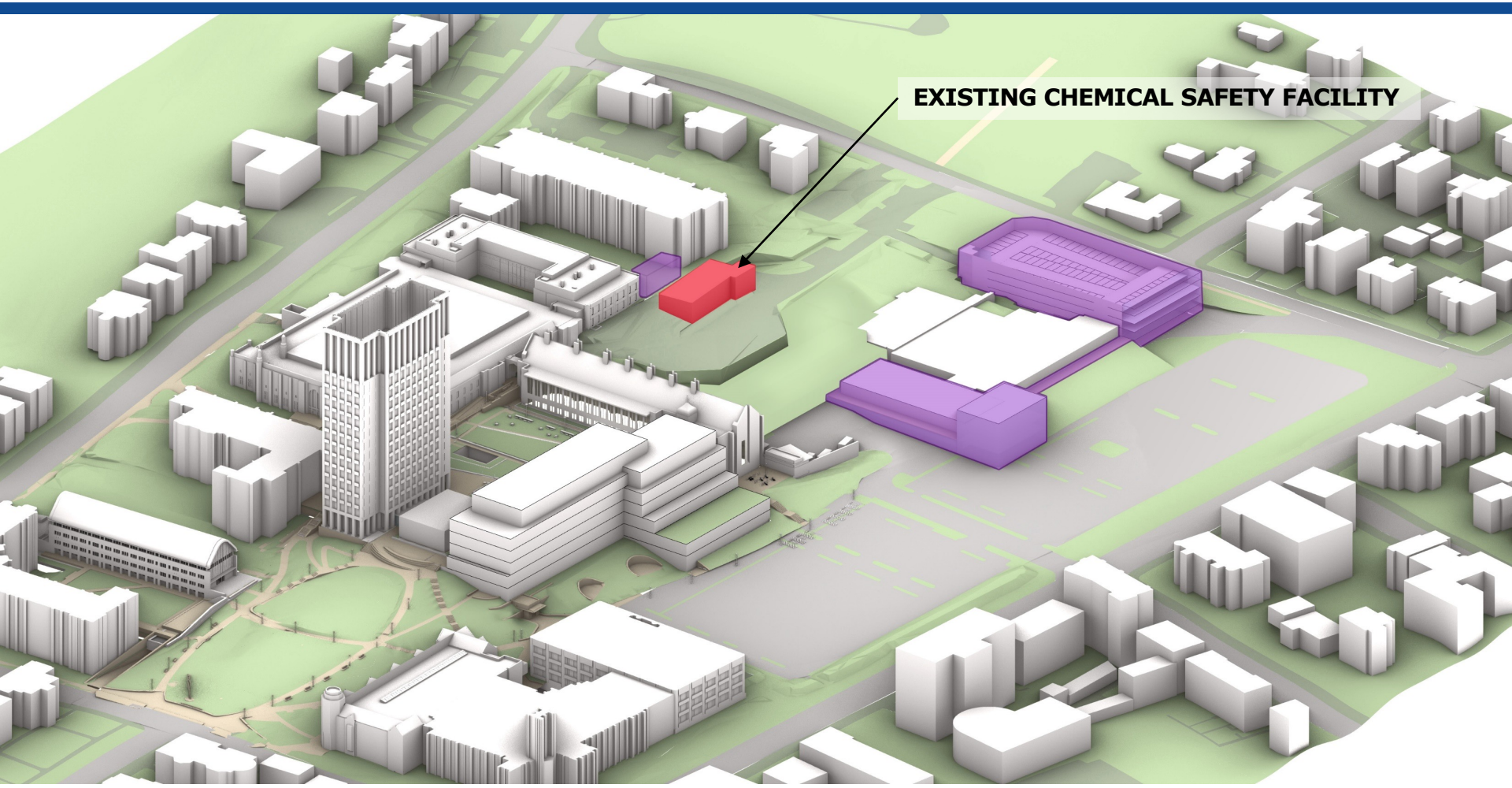
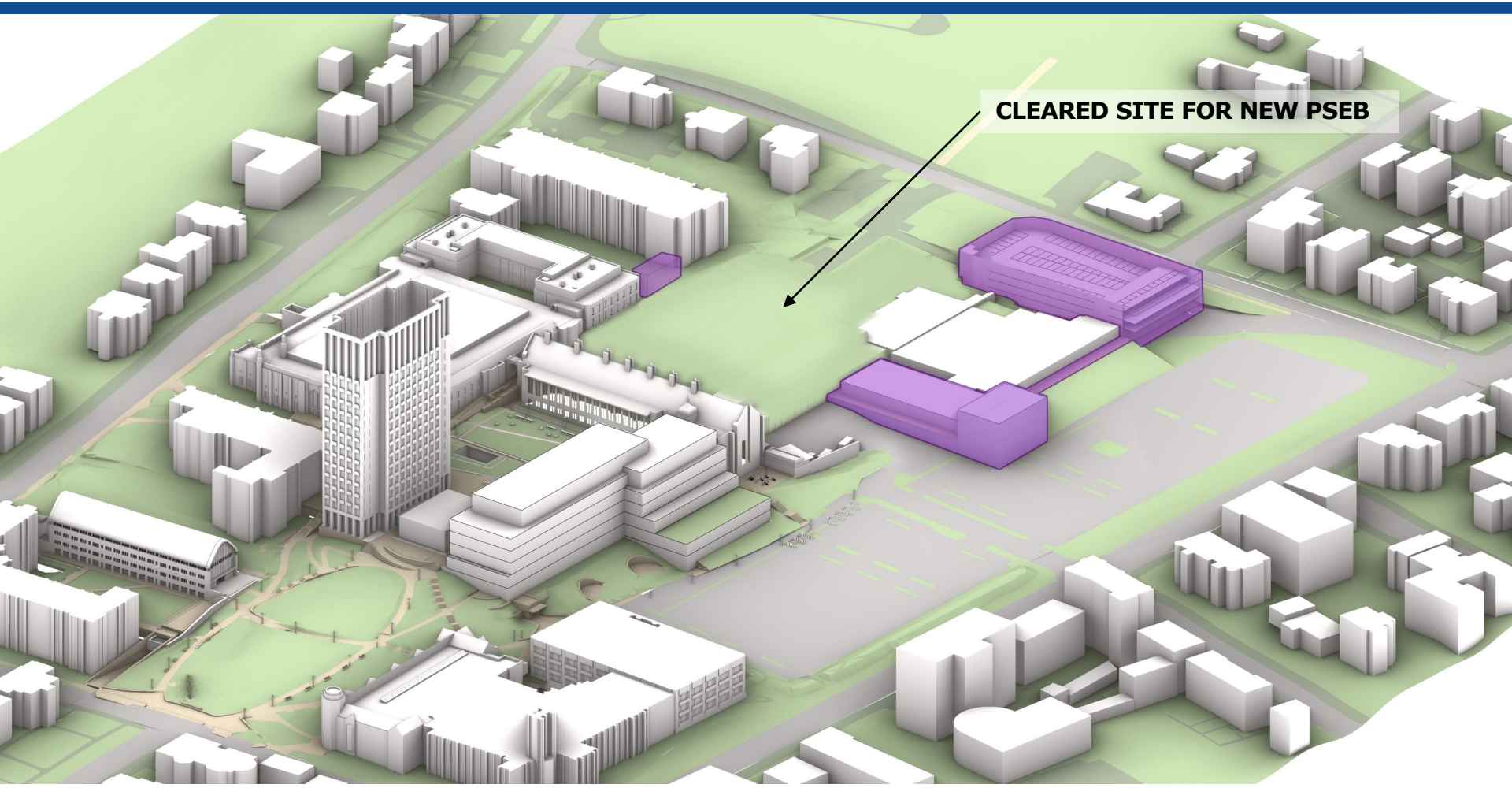
# Enabling Projects



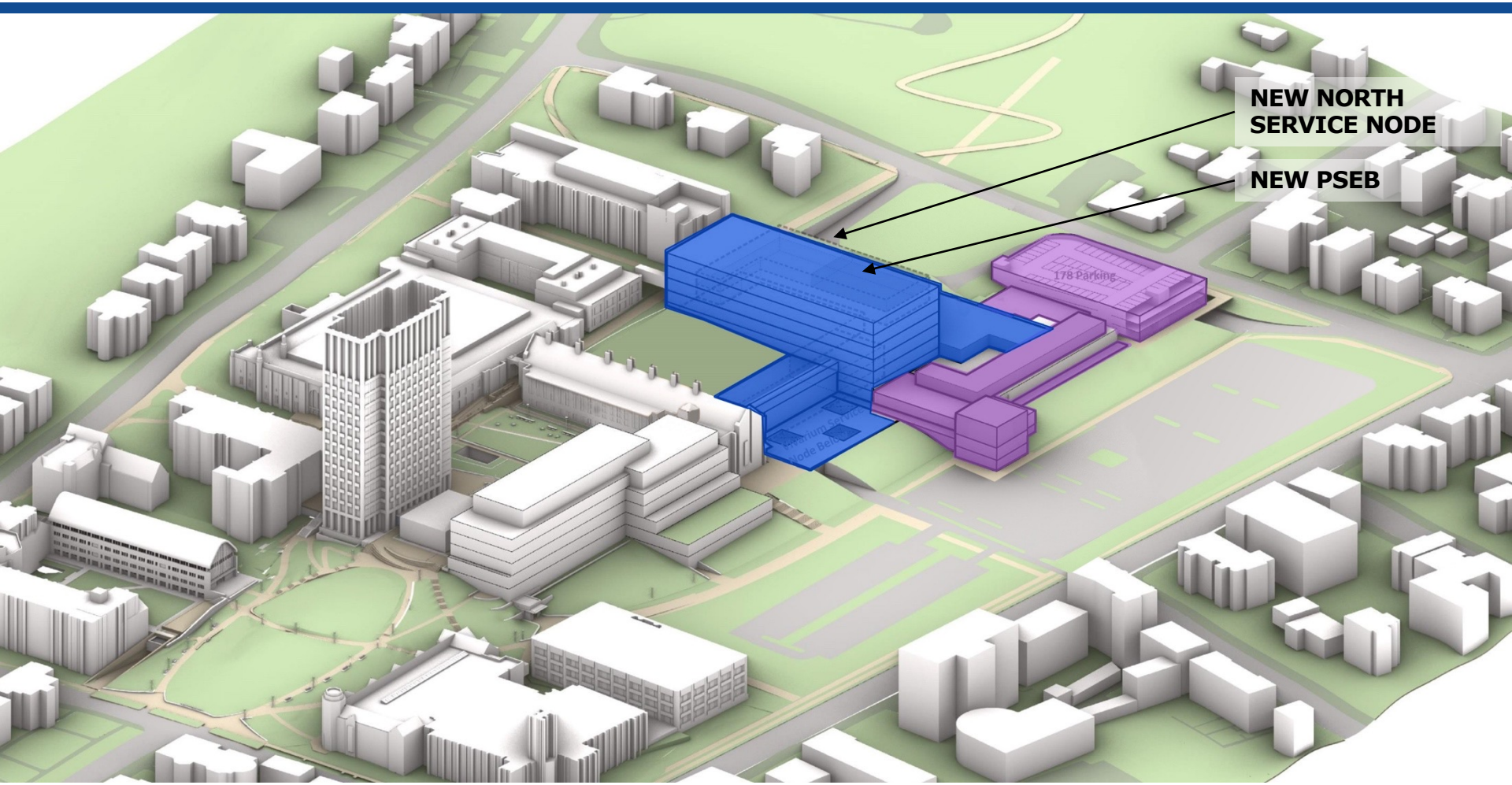

- Demolish existing Chemical Safety Building.

# Enabling Projects



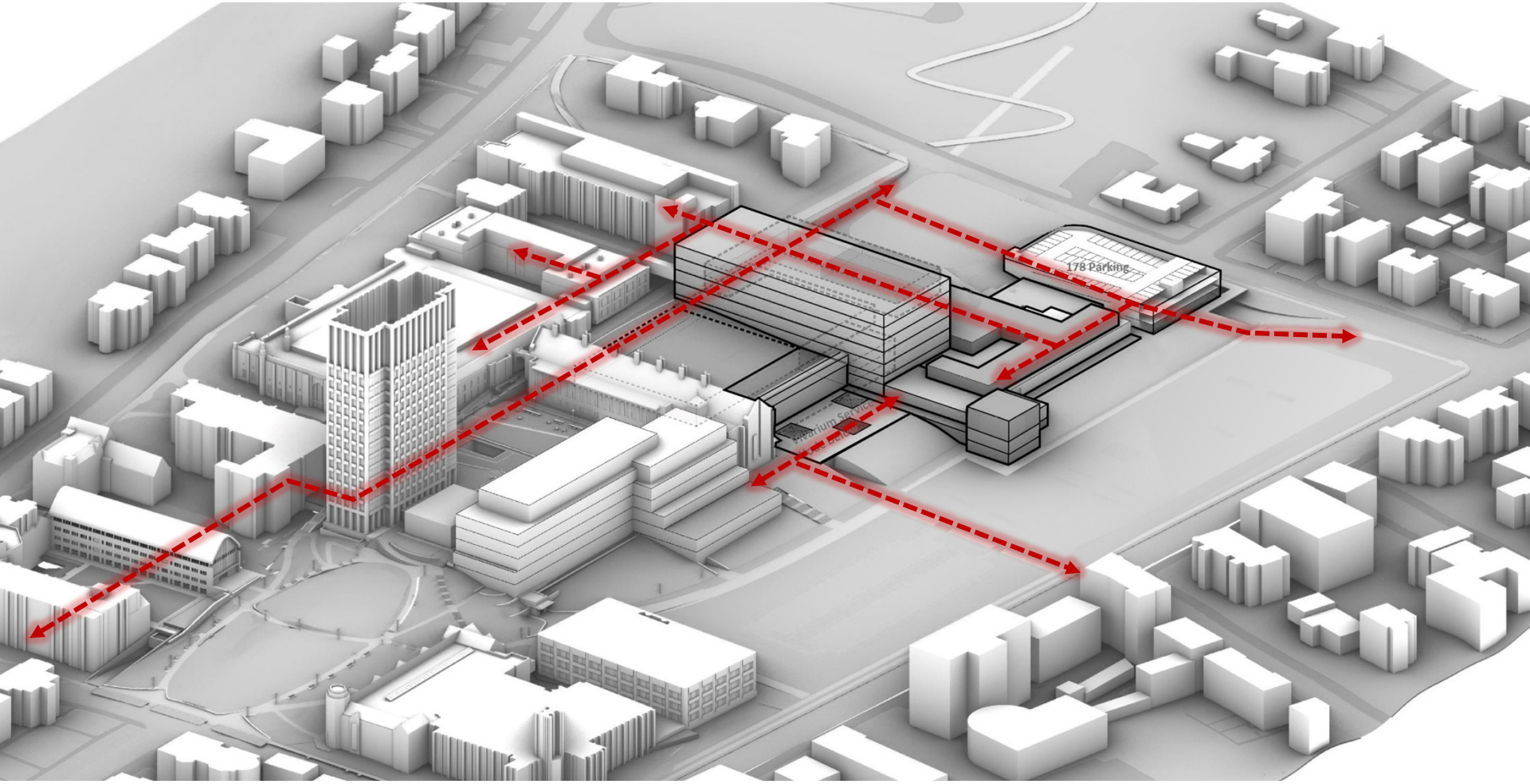

- Site cleared for new PSEB.

# New Physical Sciences & Engineering Building



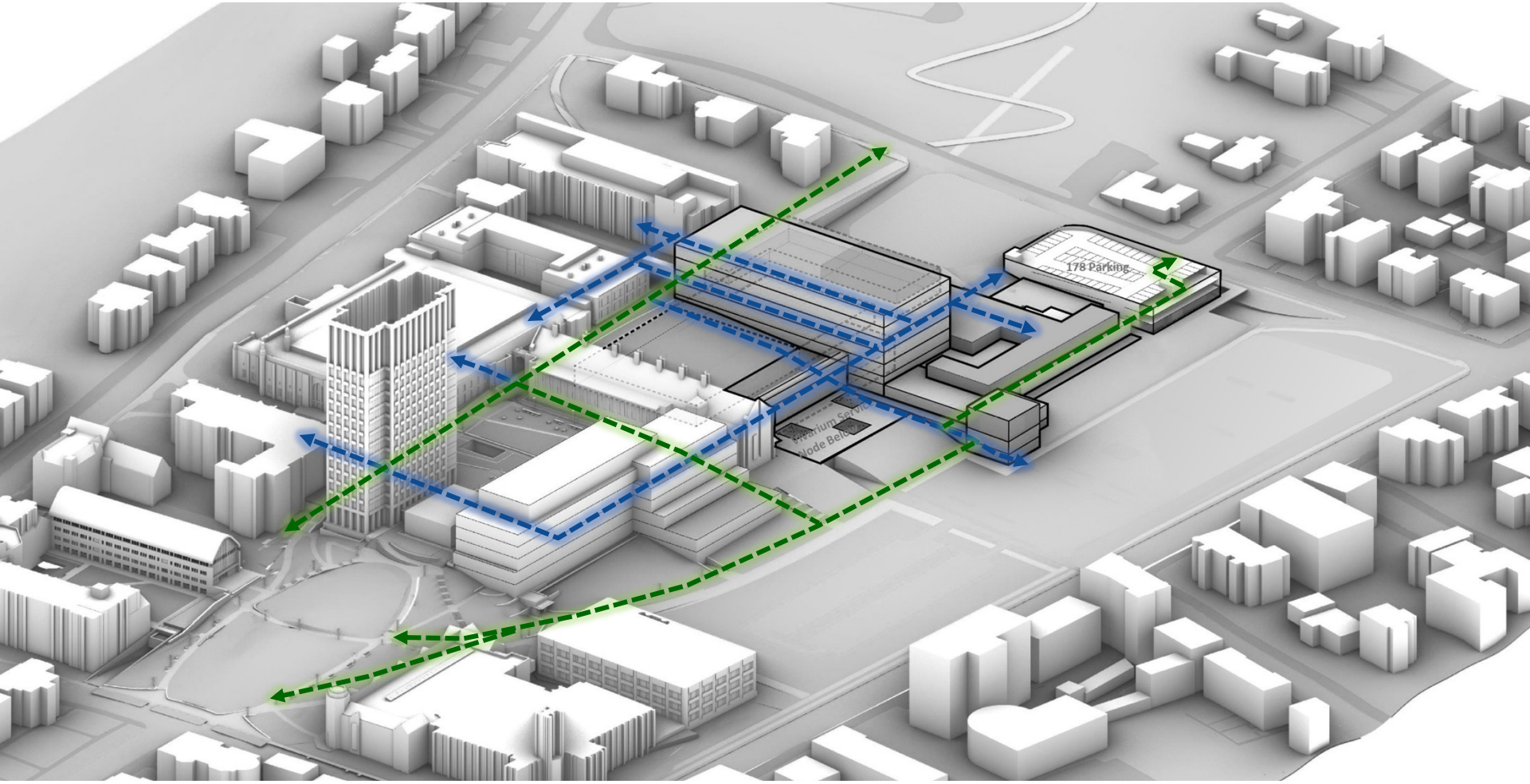

- Build new Physical Sciences & Engineering Building and new service area (including chemical safety facility).

# Service Circulation




SERVICE

# Pedestrian Circulation



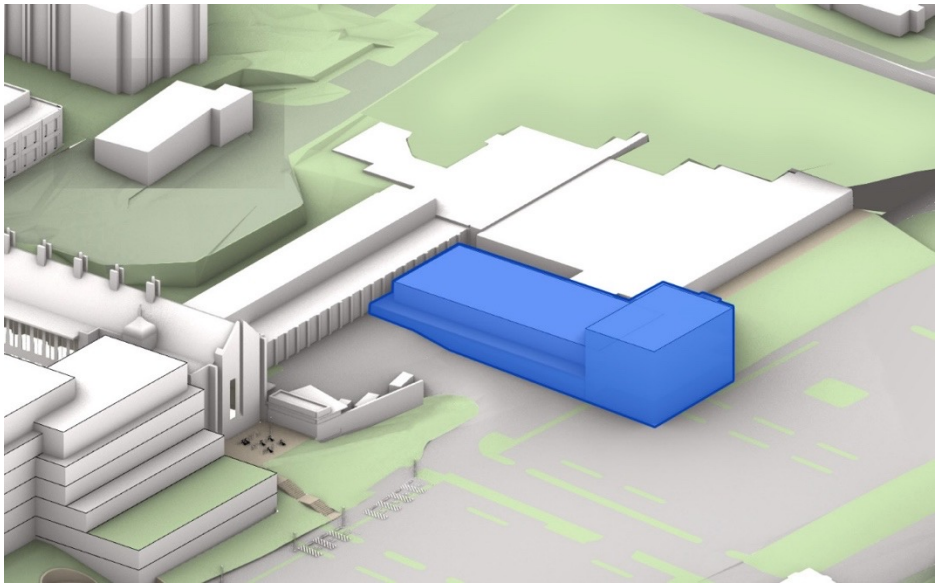

PEDESTRIAN INDOOR CONNECTIONS (BETWEEN SPL, SCL, WL, AND PSEB)

PEDESTRIAN EXTERNAL CONNECTIONS

# Instrumentation Development Initiative from the USSC

## Charge for Instrumentation Initiative Task Force

- Develop the vision for an instrumentation and technology development center in support of the USSC Instrumentation Initiative.
- Conceptualize a technology development center that would support science at Yale and serve the campus community.
- Develop technical facilities that are complementary to existing cores, CEID, and other technical infrastructure on campus
- Optimize the shops and technical facilities at Wright Lab as part of the PSEB enabling project:
  - JW Gibbs shop
  - Advanced Prototyping Center
  - Possible addition of an Electronics Development Core



# Instrumentation Initiative Task Force

- Karsten Heeger (co-chair) Chair, Physics
- Lisa D'Angelo (co-chair) Associate Provost for Research
- Jeffrey Brock (ex officio) Dean, School of Engineering & Applied Science; Dean of Science, FAS
- Todd Constable, Radiology and Biomedical Imaging, Neurosurgery and Biomedical Engineering
- Mark Johnson, Chemistry
- Rajit Manohar, Electrical Engineering and Computer Science
- Ben Myers, Director of Research Cores
- James Nikkel, WL Associate Director of Instrumentation and Education

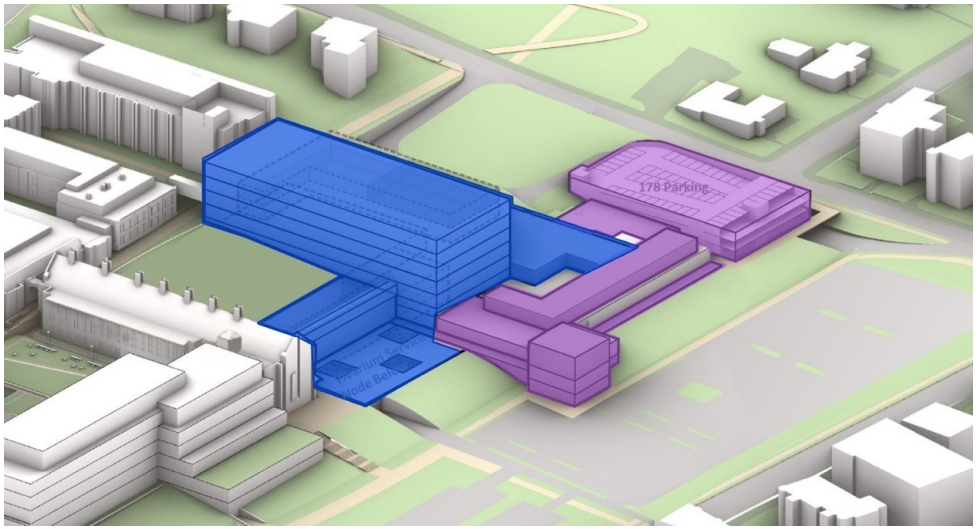
- Staffed by:
  - Steve Brown, Associate Director Planning Administration
  - Dev Hawley, Director University Planning
  - Sarah Miller, Assistant Dean for Science & Engineering
  - Jim Slattery, Associate Provost for Research

# Physical Science and Engineering Building (PSEB)

## Charge for the PSEB Working Group

- Develop the intellectual vision for the building, with particular attention to its role in enabling the Quantum Science, Engineering and Materials priority identified by the USSC

- Identify programming :
  - Research program
  - Activities of institutes
  - Core facilities




- Items out of scope:
  - WL-W replacement
  - Chemical Safety Building replacement
  - EHS radiation storage
  - WL loading and service node enhancements
  - New parking structure

# Planning Guidelines

- Think multidisciplinarily
  - Facilitate scientific excellence, connecting across disciplines
  - Think from the perspective of the institution in ways that transcend departments.

- Plan for the future
  - Evolution of research needs over thirty years
  - Reserve space for incremental faculty hires

- Consider trade-offs across types of space: research labs, office, cores, institute, collaborative space and public-facing space

- Pay special attention to core facilities

# PSEB Working Group

- Karsten Heeger (chair) Chair, Physics
- Jeffrey Brock (ex officio) Dean, School of Engineering & Applied Science; Dean of Science, FAS
- Charles Ahn, Chair, Applied Physics; Mech. Eng. and Materials Science
- Hui Cao, Applied Physics and Physics
- Judy Cha, Mech. Eng. and Materials Science
- Steve Girvin, Physics
- Jack Harris, Physics
- Rajit Manohar, Electrical Engineering and Computer Science
- Peter Schiffer, Applied Physics
- Rob Schoelkopf, Applied Physics and Physics

- Staffed by:
  - Steve Brown, Associate Director Planning Administration
  - Dev Hawley, Director University Planning
  - Sarah Miller, Assistant Dean for Science & Engineering
  - Jim Slattery, Associate Provost for Research

# Planning Process

- **Community engagement by the working groups:**
  - Committee members to meet with chairs and faculty
  - Solicitation of community input and ideas
  - Events for campus community discussions

- **Initial program definition by April 15 to provost and president**
  - Consideration at Officers' Program Review in May
  - Goal is to provide Corporation update in June

- **Timeline Goal:**
  - Begin enabling project construction in 2021 complete in 2023
  - Begin PSEB construction in 2023 with a late 2026 opening

- Detailed space programming and design will follow program definition

- Stakeholders remain engaged through design and construction

# Future Space Planning on Lower Hillhouse

**Opportunity to Reimagine the Research Spaces on Lower Hillhouse**

- PSEB and Kline projects will allow us to explore other possibilities:
  - Future major renovations to Becton and Dunham
  - Further expansion of laboratory space in 17 Hillhouse
  - Expansion of Computer Science into LOM and/or Dana House
  - Future re-envisioning of the Mason site
  - Opportunity to further develop Yale's vision for the *Innovation Corridor*

# Physical Science and Engineering Building
# An Artist's Concept