Institutional Development Plan
Roux Campus
August 2022

IDEALS
Initiative for Digital Engineering and Life Sciences

The Roux Institute
Northeastern University

Design Principles

The Roux Campus will be a paradigm for 21st-century education with urban, sustainable, and resilient design. All elements of the campus will be conceived holistically to support the educational program of the Roux Institute. Near and long-term planning supports a vibrant campus environment with views and connections to the waterfront, a variety of public spaces, and site access via bike paths, walkways, and the public pier. Key principles of the design approach include:

Connected to the Waterfront, Portland, & the World

Engage the waterfront
Promote visual and physical connectivity
Encourage connections to the waterfront through diverse spaces
Create a holistically built environment
Restore, repurpose, and revitalize the Bean Building
Create an iconic architectural expression

Places to Gather

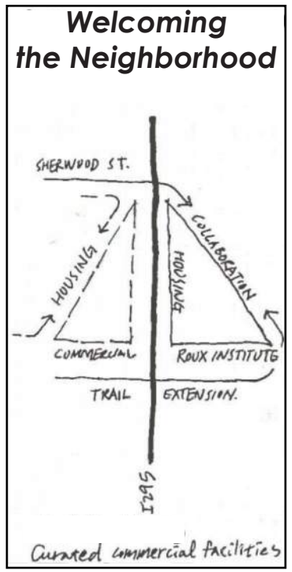
Welcome the surrounding neighborhood
Foster community with shared spaces and interaction
Build a strong association with the City of Portland
Develop purpose-driven spaces that yield regular connections
Provide public open space
Provide spaces where neighbors can work and read while enjoying the campus's environment

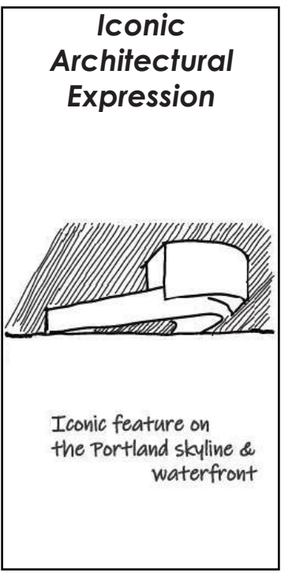
A Sustainable & Resilient Campus

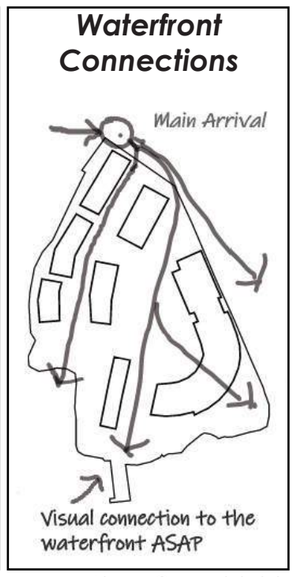
Employ sustainability benchmarking for environmental stewardship
Incorporate state-of-the-art features, systems, and techniques
Minimize energy consumption campus-wide
Build for resilience; prepare for extreme weather and climate change
Maximize green space through appropriate building height

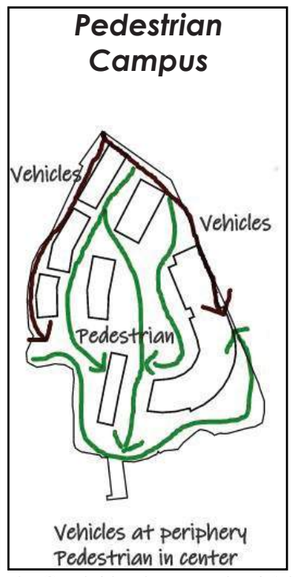
Integrated Landscape

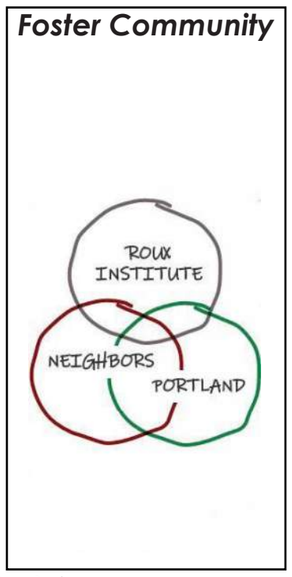
Enhance access through TDM and multi-modal support
Contribute to Portland's open space network





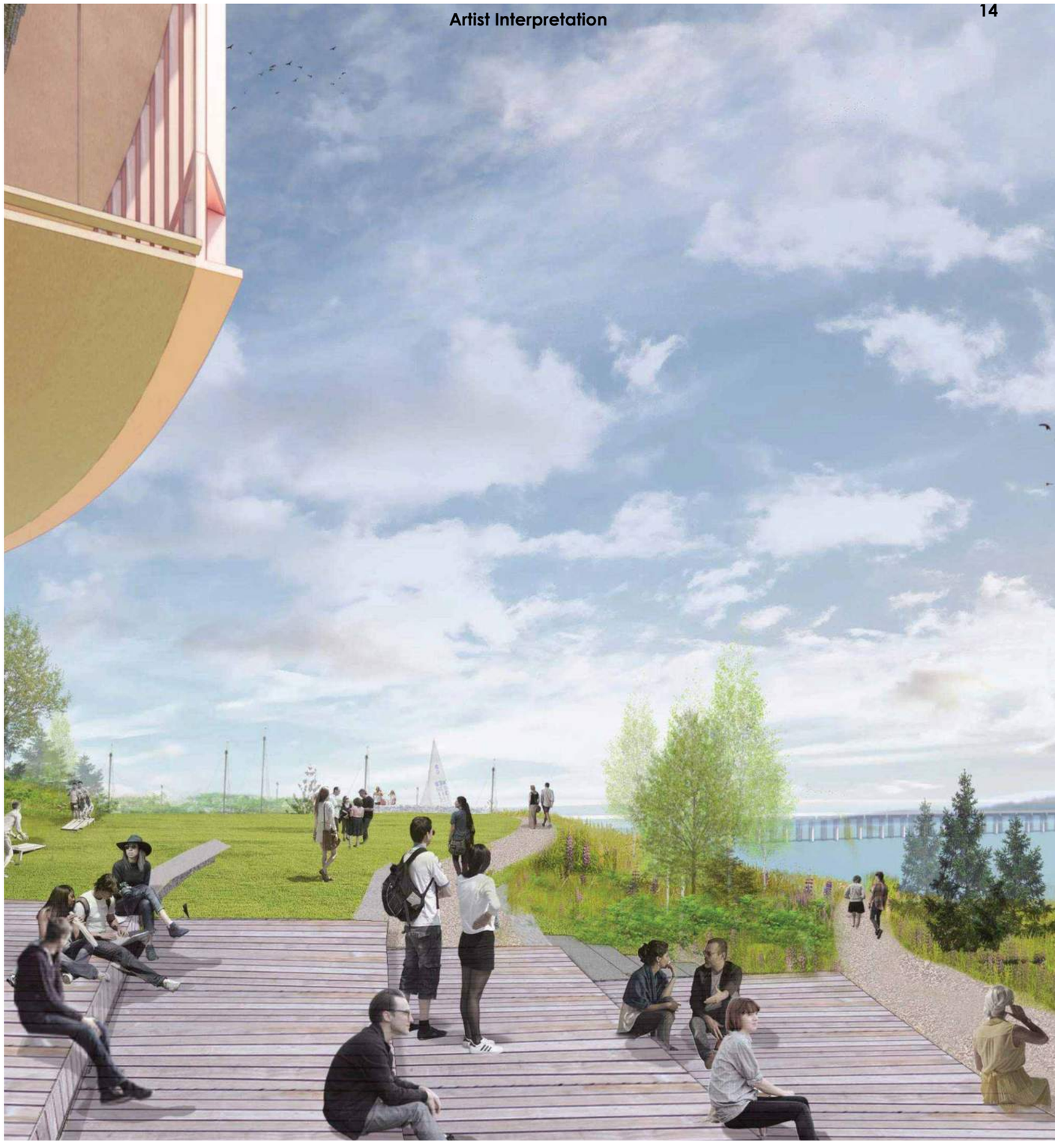






Above: Concept sketches by Cambridge Seven and Tsoi Kobus Design

Artist Interpretation



Connected to the Waterfront, Portland & the World

Artist interpretation

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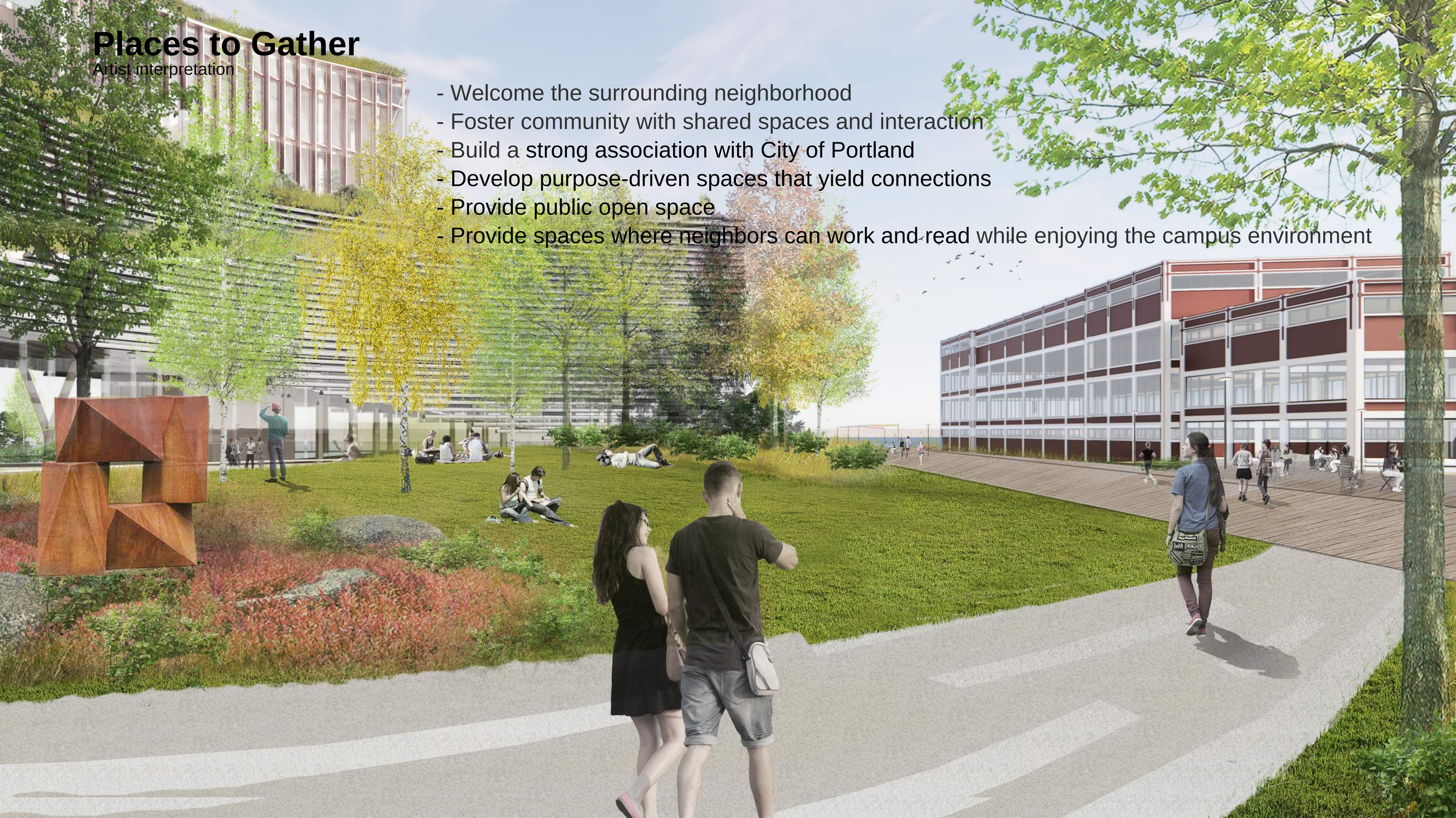

A Sustainable & Resilient Campus

path to a charter

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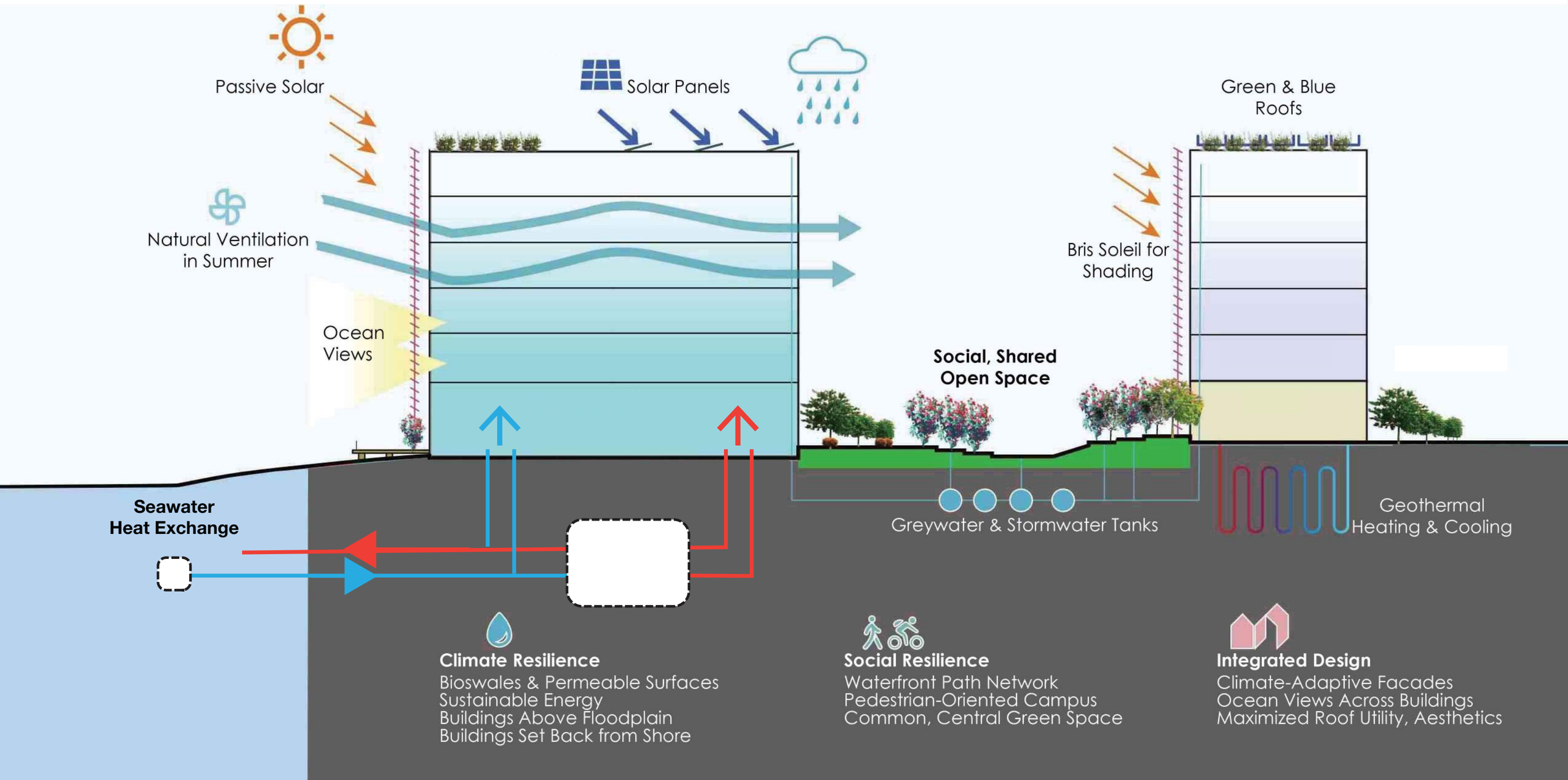


Environment

Strengthening Resilience & Ecology
Under current conditions, the site is approximately 75% impervious with approximately 10 acres of building roofs, parking areas, and loading dock space. Minimal shoreline buffer is present at the site, with pavement extending right up to the armored embankment along much of the shoreline. Existing site grades adjacent to the Bean Building are only 1-foot above highest astronomical tide. In recognition of these existing vulnerabilities and with a desire to improve ecological function for the site, the redevelopment will raise interior site grades and soften landscapes to reduce impervious area and increase flood resilience. Living shoreline techniques for landscape will enhance some of the natural resource areas along the water's edge.

Energy Consumption
The development presents an opportunity to mitigate energy consumption through high performance building envelopes, particularly with the likely southern exposure of the Institute building. Similarly, we intend to explore and hopefully incorporate renewable energy sources such as active and passive solar, sea water cooling, and / or geothermal.

Noise Generation
The proposed mixed-use academic campus is compatible in uses with the surrounding East Deering neighborhood. The Roux Campus is buffered by I-295, the abandoned Grand Trunk Railway, and adjacent marine uses. Development will adhere to City of Portland technical standards regarding noise, vibration, and other potential nuisances. Pre-development noise measurements will serve as the baseline of analysis, in order to assess noise impacts accurately and to allow improvements to baseline conditions where possible. Development will employ noise abatement techniques (screening, acoustical attenuation, landscape buffering, etc.) for the benefit of residents, students, and all users of the site.

Hazardous Materials
Use of hazardous materials, if any, will be in academic and laboratory contexts, and managed in conformance with all local, state, and federal requirements.

Heat, Glare, and Radiation
Development studies will include analysis of heat, glare, and radiation impacts in order to understand and eliminate safety hazards and lessen impacts of new development. Development will comply with all City standards regarding heat, glare, and radiation.

Wind
Wind and occupant comfort analysis will be performed during each phase of development when applicable site plans are reviewed, with design modifications as necessary to maintain acceptable conditions. The analysis will include comfort at and around buildings as well as major public spaces. Existing buffers of plantings at property lines will be maintained or replaced where appropriate. This will be coordinated with the City of Portland arborist.


Artist Interpretation

Lighting
Exterior lighting will be full cut-off and dark-sky friendly. Fixture output will comply with all City of Portland lighting regulations to avoid light spill into neighboring areas from the site. Photometric analysis at each phase of development will be used to inform lighting design in accordance with Illuminating Engineering Society of North America (IESNA) Standards.

Height and Massing
The allowable building heights on the Roux Campus are informed by the historic location and prominence of the Bean Building, the desire to create meaningful public open space while meeting all programmatic goals for the Roux Institute, resilient building design, and potential shadow and other impacts to neighboring properties. Building heights will stagger, with the greatest height at the center of campus and lower heights near the site's boundaries. Building heights around the Bean Building and within 35' of the western and northern edges of the campus will be no greater than 75'. Conceptual massing studies based on allowable building heights are attached as Appendix A.

Shadows
Height and massing will minimize shadow impacts to neighbors and avoid negative impacts to nearby existing public open spaces. The campus height map places the greatest heights to the middle of the site and progressively lower zones to the perimeter. Mechanical enclosures will be set back from roof edges to minimize impact. Conceptual shadow studies based on allowable building heights are attached as Appendix B.

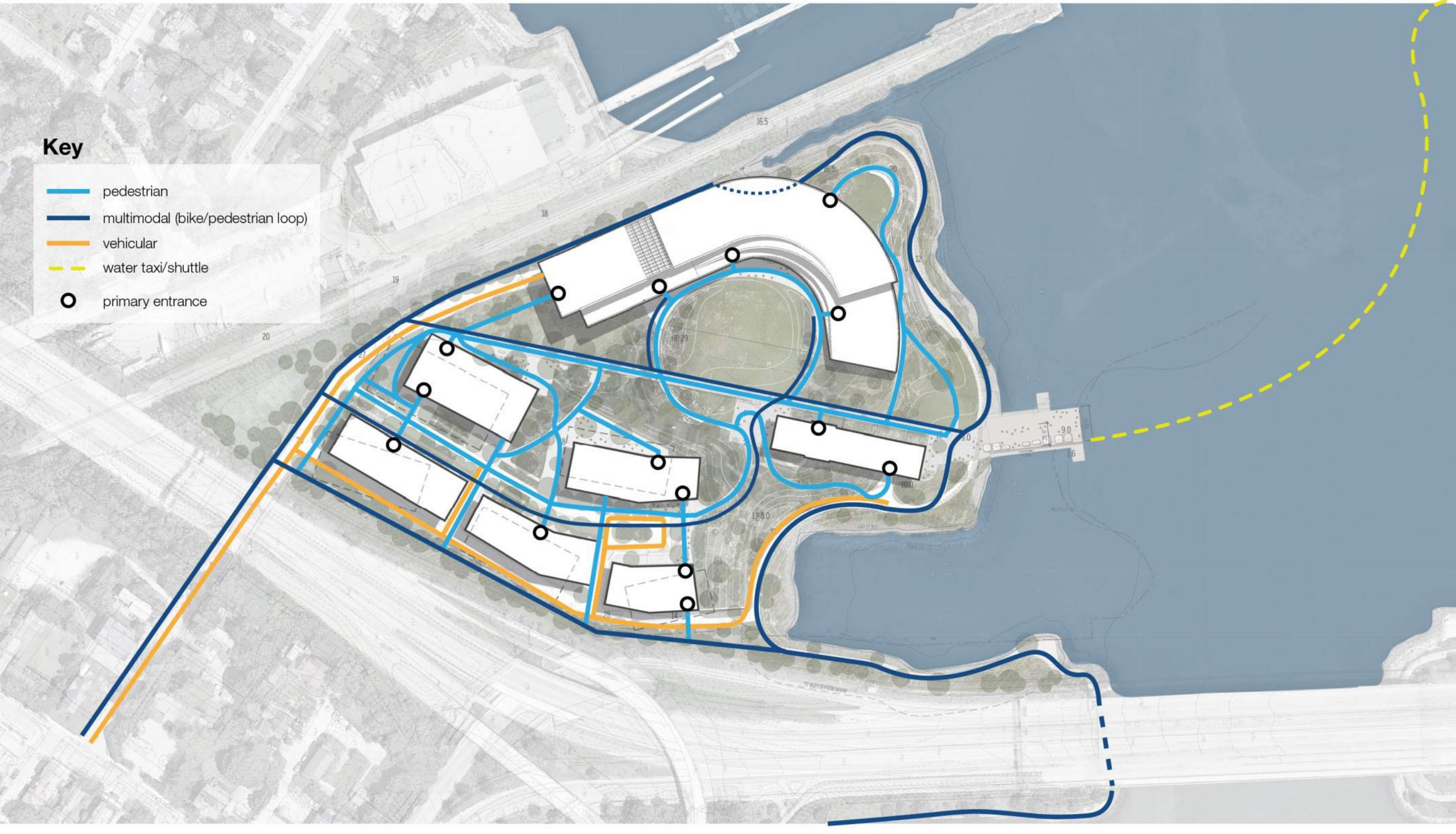

Existing Condition

Integrated Landscape

Artist interpretation

- Enhance access through TDM and multi-modal support
- Contribute to Portland's open space network

Site Circulation and Open Space Network



Transitions

With I-295 to the west, state-owned vacant parcels to the north, the rail corridor and marine business to the east, and Casco Bay to the south, the Roux Campus is surrounded by existing areas of transition from the campus to the surrounding neighborhoods. In addition to the existing buffers, development will further ease the transition to and from the campus through the following design methods.

Between Site Entrance & Campus
Public open space will ease transition from the smaller scale of Sherwood Street. Views to the water and the Bean Building, and clear wayfinding and circulation of pedestrian and bicycle pathways, will welcome site visitors further into the campus. A smooth transition will also be accomplished through thoughtful facade design at the pedestrian level. Potential nuisance features like dumpsters, air handlers, and parking will be appropriately screened. Buildings will avoid blank walls to respect the adjacent neighborhood and facilitate a sense of permeability and welcome.

Between Buildings & Campus
Building entrances will face major public spaces or circulation paths. Lower stories will be programmed for activation where they meet the pedestrian realm or feature visually interesting details and activities related to the building. Building articulation, massing, and materials will contribute to the sense of a well-textured, connected campus.

Between Campus & Water
The shoreline area between the buildings and the water will serve as meaningful public open space. This open space will contain a combination of pedestrian and bike trails, passive and active gathering spaces, restored and ecologically improved landscape and shoreline to anchor the site's relationship with the water. Building facades facing the water will be considered public-facing, with views designed for interest from the water and Eastern Promenade Trail.

Safety / Crime Prevention Through Environmental Design (CPTED)
Key to these successful transitions is a sense of welcome, comfort, and safety. To ensure this, the campus will incorporate the following CPTED design strategies demonstrated to deter crime:

Mixed Use, multi-tenant 24-hour campus that generates "threshold capacity" for a diversity of places, people, and programs

Ecologically restored, biophilic and publicly accessible campus connected to the wider community

Highly durable, vandal-resistant materials in the public realm to communicate a well-maintained, clean campus

Systematic, clear, and appropriately scaled wayfinding to guide and inform all transportation modes and user groups

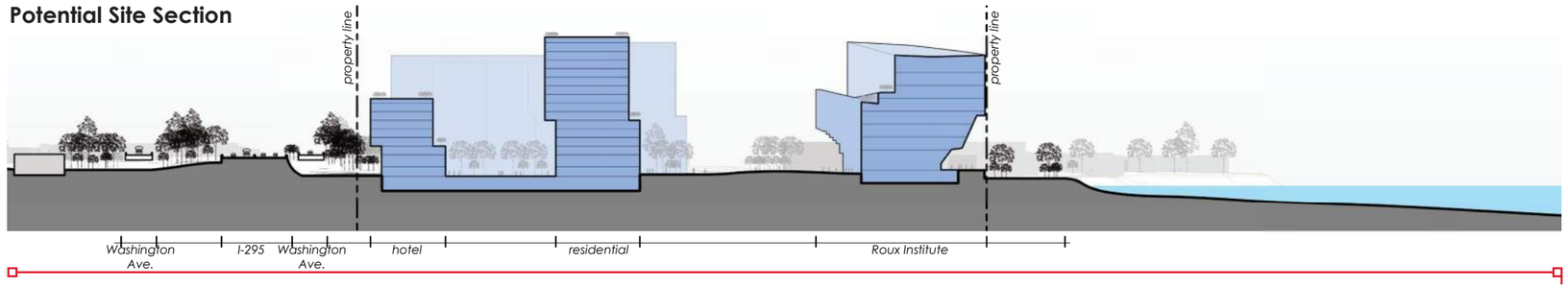
Matrix of pedestrian and bike paths connecting well-lit transit stops, bike storage areas, and parking areas to maintain clear sight lines

Street-level building elevations designed for visibility, minimizing hidden corners and spaces

Transparency and openness of buildings at ground levels and entrances to connect with the public realm and create pathways

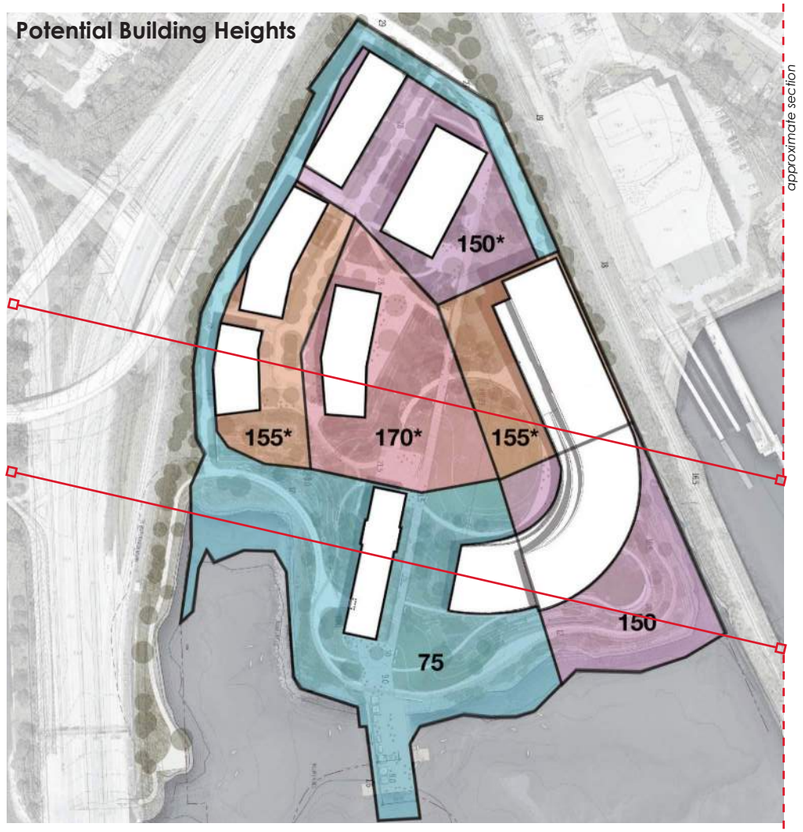
Controlled campus access points for special events or emergencies

Potential Site Section



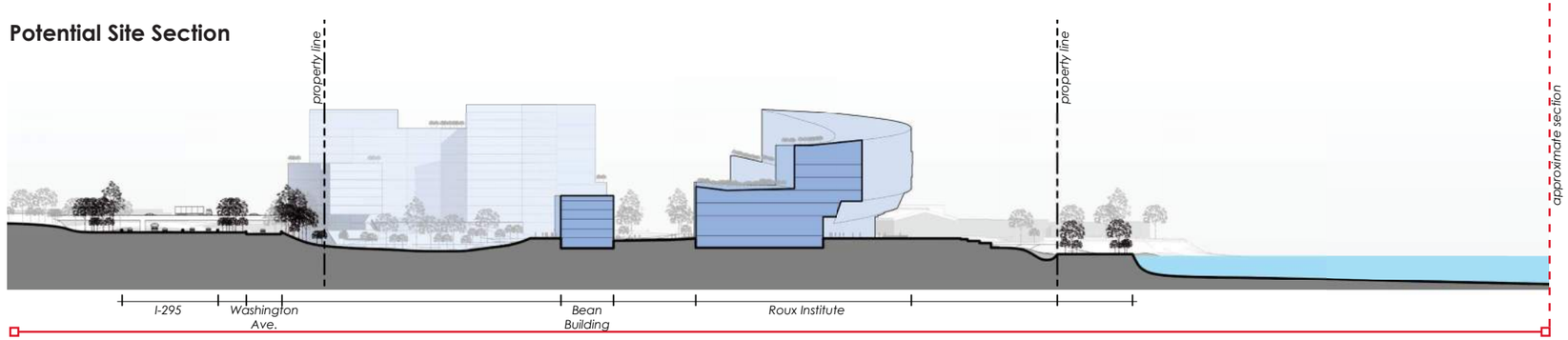
Potential Open Space Breaks and Buffers

Potential Building Heights



approximate section

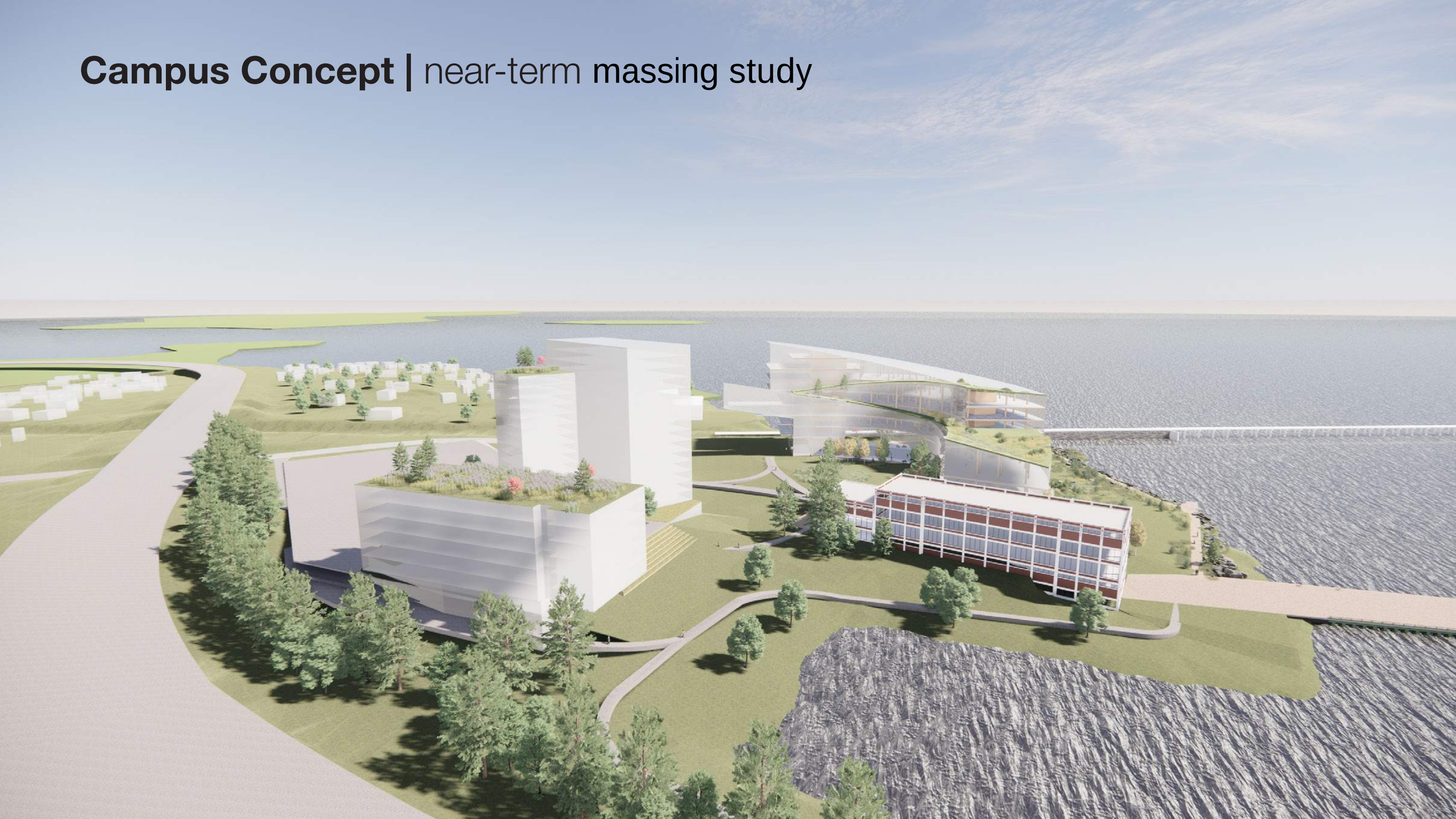
Potential Site Section



approximate section

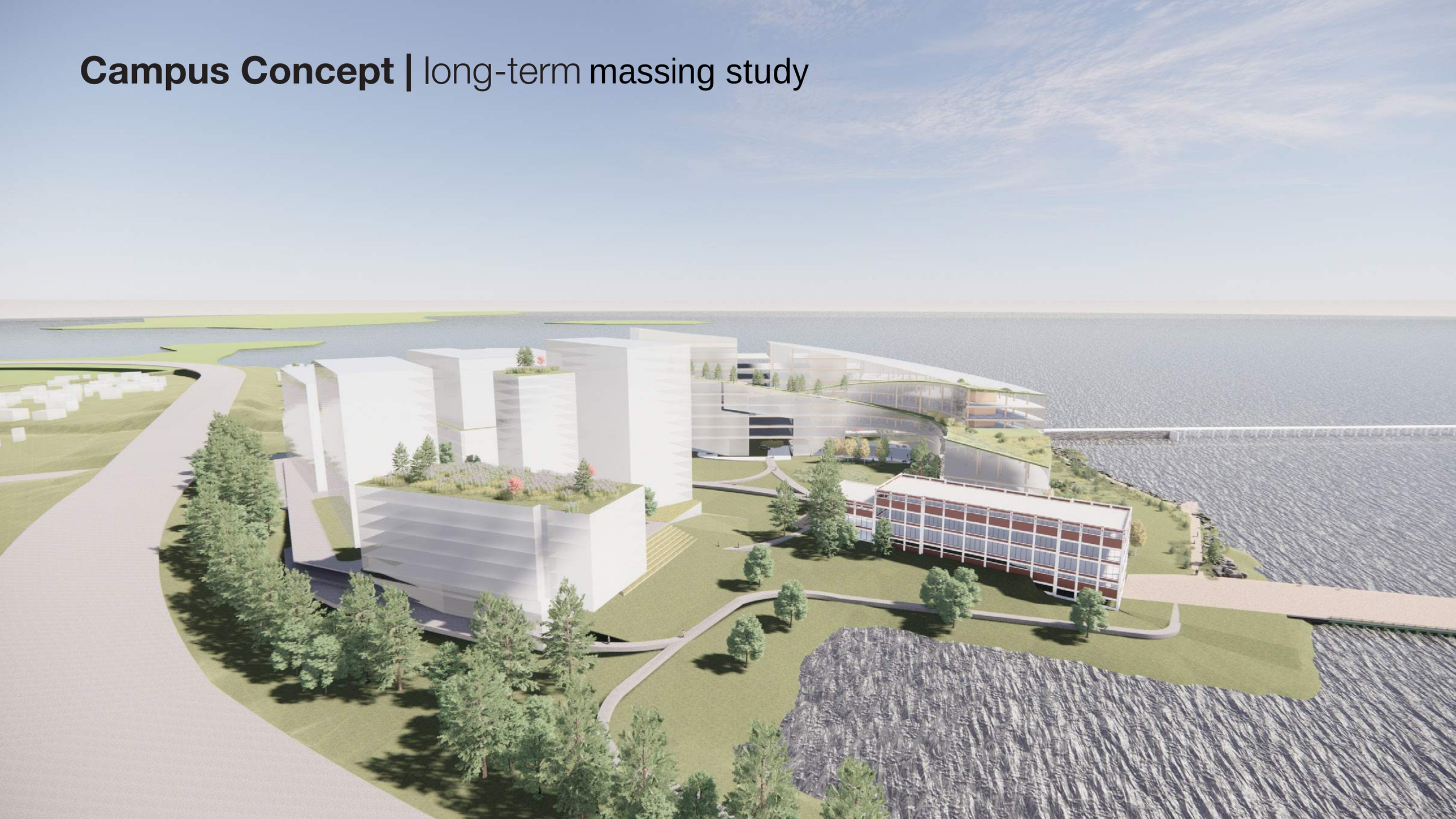
Campus Concept | near-term **massing study**

Campus Concept | near-term **massing study**



Campus Concept | long-term massing study

Campus Concept | long-term **massing study**



Shadow Study Example | Key Plan

existing shadow: private residence

new shadow: Institute Building

existing shadow: Cannery Building

December 21st

Near Term

Shadow Study | December 21 9am, Noon & 3pm, near-term & long-term

December 21st

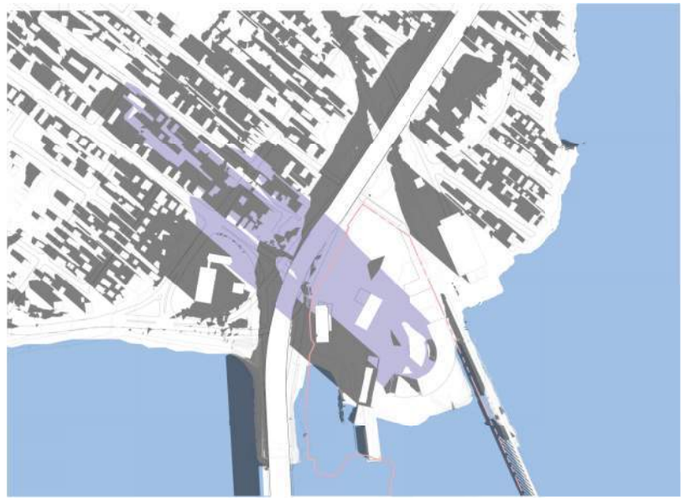
Near Term

Long Term

9:00 AM

Noon

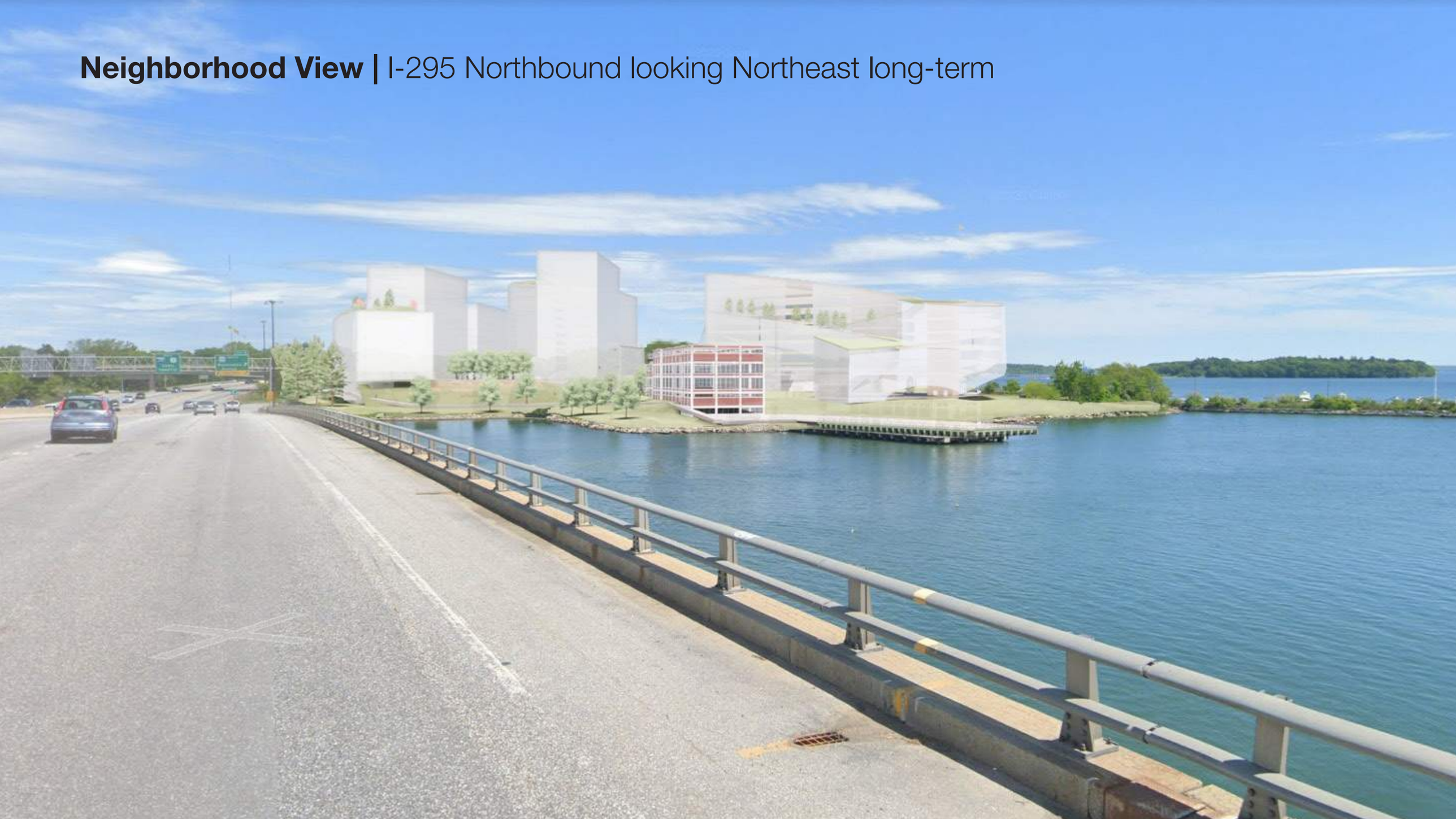
3:00 PM



Shadow Study | Dec/June: 9am,10:30am Noon,1:30pm & 3pm, near & long-term

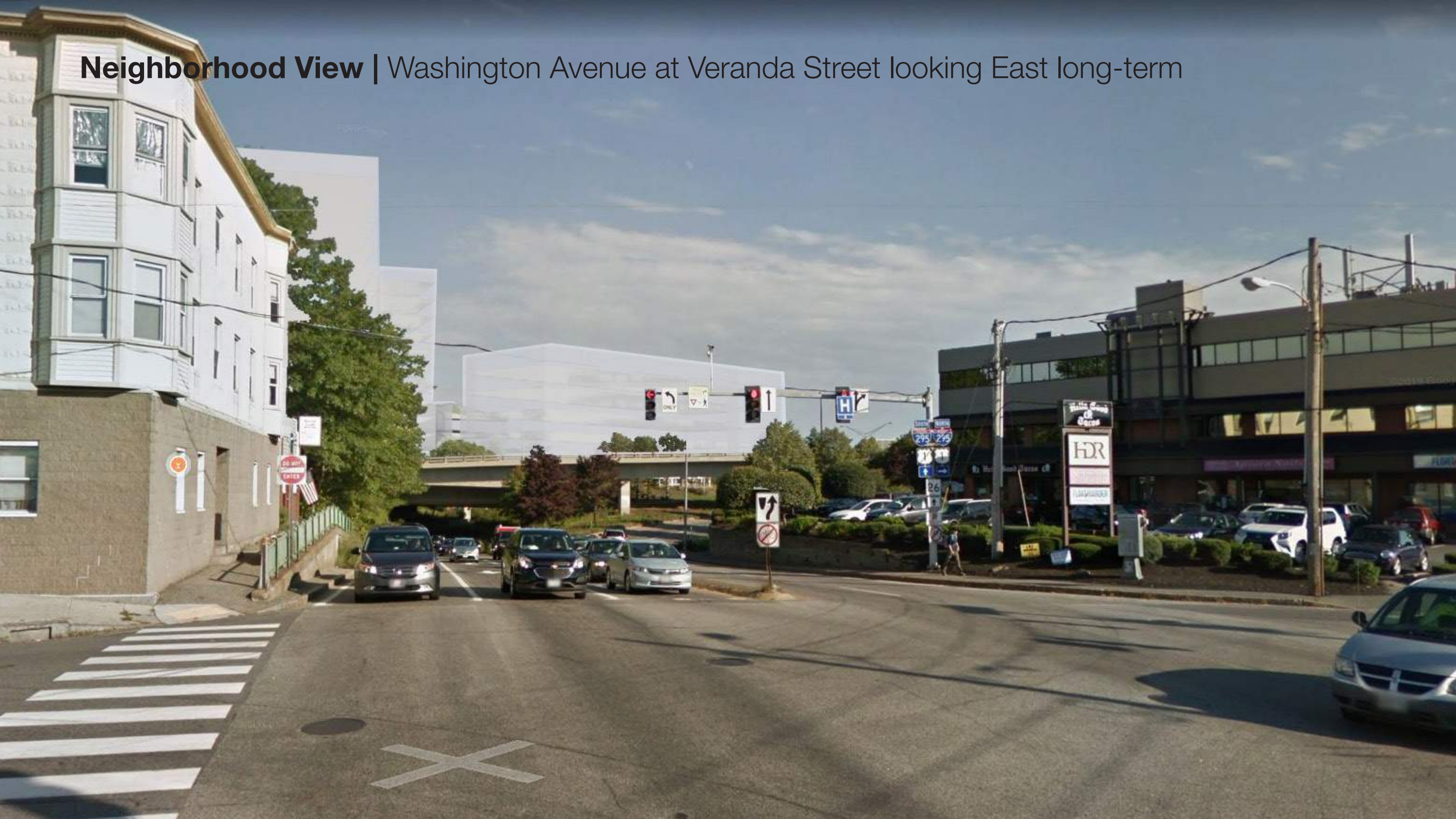
Neighborhood View | I-295 Northbound looking Northeast near-term

Neighborhood View | I-295 Northbound looking Northeast long-term



Neighborhood View | Washington Avenue at Veranda Street looking East near-term

Neighborhood View | Washington Avenue at Veranda Street looking East long-term



Neighborhood View | Berwick Street South looking West near-term

Neighborhood View | Berwick Street South looking West long-term

Neighborhood View | Berwick Street North looking West near-term

Neighborhood View | Berwick Street North looking West long-term

Roux Institute at Northeastern University

August 9, 2022

Thank You!