

CHAPTER 7 SUSTAINABILITY & RESILIENCY

This chapter describes Wentworth's existing sustainability programs, while also setting forth future goals for sustainability initiatives to ensure that Wentworth continues to demonstrate its commitment to these important goals that has earned the University recognition as one of the nation's leading environmentally responsible colleges and universities.

7.1 Existing Sustainability Initiatives and Programs

Since 2010, Wentworth has continued to demonstrate its leadership in campus sustainability. According to the Princeton Review Green Rating, Wentworth has been recognized as one of the nation's most environmentally responsible colleges and universities for eight years in a row. The University takes an integrated approach to sustainability, embedding environmental and social responsibility principles in its planning, operations, and academic programs. Progress is monitored through regular reporting using the Association for Advancement of Sustainability in Higher Education's Sustainability Tracking and Rating System ("STARS").

7.1.1 Sustainable Design and New Construction

Wentworth adopted LEED Silver-certifiable new construction practices in 2005, pre-dating the City of Boston's Article 37 zoning amendment and exceeding its current requirement to meet LEED certifiability. Over this timeframe, Wentworth's new construction and major renovation projects have achieved the LEED Silver certifiable target, resulting in more than 25% of campus buildings (by gross square feet) being built or renovated to high-performance building standards. Highlights of major projects since the Prior IMP filing are provided below:

- **Flanagan Campus Center** (2012) created a hub for student activities, integrating energy efficiency, daylighting, and views and adding spaces for flexible programming.
- **Ira Allen Building** (2012) is an example of adaptive reuse, conserving resources, reducing embodied carbon, and avoiding urban sprawl. The "Forum" connects old and new buildings to provide spaces designed for today's engineering teaching and practice.
- **The Apartments at 525 Huntington** (2014) offer student residences built with sustainable materials and focused on occupant comfort. Wentworth ensured that this site, formerly gas stations, was remediated to remove environmental contamination. It was also the first campus project to incorporate design features to improve climate resiliency, such as locating critical HVAC equipment on upper floors.
- **Schumann Library and Learning Commons** (2016) was an interior renovation project that followed LEED ID+C standards to refresh the library and create a dynamic area for student collaboration, with improved acoustical performance and natural light.

- **Center for Engineering, Innovation and Sciences (“CEIS”)** (2018) is a building designed for energy and water efficiency, as well as human health. It houses state-of-the-art laboratories, classrooms, gathering spaces, and offices to foster hands-on, interdisciplinary learning. This project reduced operational carbon by 23% compared to baseline construction, reduced indoor water use by 39%, and reduced outdoor water use by 57%. It also hosts Wentworth's first 22kW solar panel photovoltaic array on its roof as a demonstration project.
- **Beatty Dining Hall** (2022) is a recently completed interior renovation project of the University's only dining hall. Formerly a grab-and-go operation, the new all-you-care-to-eat facility approaches zero-waste by eliminating disposable food packaging and sending 100% of food waste to an off-site biodigester. More than 50% of new kitchen equipment is Energy Star rated, and the project reduced reliance on fossil fuels by switching from a gas to an all-electric pizza oven.
- **600 Parker/New Sweeney Field** (Opening 2024) will consist of an athletic playing field constructed above a single-story parking garage. This project is being constructed to Parksmart standards, a green rating system for parking garages. Sustainable transportation features include Wentworth's first installation of EV charging stations (45 spaces with Level 2 charging and two spaces with Level 3 fast-charge capability) and a secure bicycle shelter to store both bikes and motorized scooters.

7.1.2 Sustainable Campus Operations

Wentworth's operational sustainability programs focus on five core areas:

- Climate and Energy
- Waste and Recycling
- Land Use and Water
- Purchasing
- Transportation

7.1.2(a) Climate and Energy

Overseen by Wentworth's Director of Energy Management and Sustainability, the University's climate action program includes numerous initiatives to lower energy use and reduce the campus's carbon footprint. Wentworth tracks campus GHG emissions annually and has partnered with National Grid and Eversource in a strategic energy management program since 2017. More than 35 energy efficiency projects have been implemented, with expected annual savings of nearly nine million kWh of electricity, 187,000 therms of natural gas, and 3,900 metric tons of CO₂ avoided. These included:

- **Energy Infrastructure Improvements** such as repairs to the power plant cogeneration system, which produces nearly one-third of campus power and recovers waste heat to produce steam for heating buildings; repairs to the smaller cogeneration units at 610

Huntington; replacement of the main campus chiller plant with expanded capacity; and participation in ISO New England demand response.

- **Integrative Energy Planning for New Construction** including energy modeling, efficiency measures for envelope, HVAC, lighting, and controls; and strategies to ensure high performance such as advanced energy metering and enhanced commissioning.
- **Energy Efficiency Retrofits** ranging from LED lighting to VFDs, steam trap repairs, laboratory and kitchen hood control projects, insulation, and low-flow showerheads.

Regarding renewable energy, the CEIS solar array produces about 26,000 kWh per year, and the University purchases 20% green power (Green-e certified RECs) through its electricity supply contract. Wentworth has been recognized as an EPA Green Power Partner since 2018.

7.1.2(b) Waste and Recycling

Wentworth has continued its successful 35-year partnership with Boston Public Schools' STRIVE program, detailed in **Chapter 8**, to offer career pathways and work experience for students receiving special education services. The STRIVE team collects and sorts recyclables from across the University, thereby providing a critical service of reducing recycling contamination and engaging daily with campus community members. In addition, Wentworth hosts annual green move-out campaigns to donate household items to Goodwill and regularly achieves 50-70%+ diversion of construction and demolition waste on large projects. Other waste diversion programs include recycling of mattresses, electronics, and waste vegetable oil, and yard waste composting. Collectively, these efforts divert approximately 30% of overall campus waste.

7.1.2(c) Land Use and Water

Wentworth recognizes the ecosystem services and community wellness benefits that the campus landscape provides. Existing stormwater recharge systems have an estimated capacity of over 8,800 cubic feet of storage. Since the Prior IMP filing, several projects have led to improvements, such as reducing the heat island effect and increasing stormwater recharge. These include:

- **Apartments at 525 Huntington Avenue:** Added a groundwater recharge system on a formerly impervious site, used native and adaptive plantings requiring no irrigation, and installed a cool roof to reduce heat gain.
- **Pike Pathway:** New trees, rain gardens, permeable pavers, and bioswales were added to encourage rainwater infiltration, and a light-colored concrete walkway was installed to reduce heat gain.
- **CEIS:** Installed smart irrigation technology and adaptive plantings to reduce water demand surrounding the building and selected light-colored concrete and roof materials, architectural shading, and shade trees to reduce the heat island effect.

7.1.2(d) Purchasing

Following higher education best practices, Wentworth uses its procurement process to minimize environmental impacts associated with the following products and services: electronics purchasing, janitorial services, and dining services.

- **Electronics:** The University's green purchasing policy establishes preferences for electronics that meet either Energy Star or EPEAT Bronze (or higher) certification standards. Approximately 25% of electronics are either Energy Star or EPEAT Gold certified.
- **Janitorial Services:** Wentworth continues to employ a green cleaning program meeting LEED O+M standards to ensure that healthy and environmentally preferable products are used and that proper procedures are followed for worker safety and better indoor air quality. Approximately 61% of cleaning and janitorial paper products (by spend) meet third-party sustainability certifications such as Green Seal, UL ECOLOGO, and Forestry Stewardship Council.
- **Dining Services:** Wentworth has partnered with its dining contractor to improve sustainability, including commitments to 100% fair trade coffee and tea, 100% cage-free eggs, 100% certified sustainable seafood, prioritizing poultry and meat produced with humane practices, and offering low-impact and plant-based dining options. Approximately 15% of expenditures are from suppliers that are local, disadvantaged, minority-owned, women-owned, and small businesses. In addition, regularly hosted farmers markets and other awareness campaigns promote sustainable dining and have introduced reusable "green-to-go" containers to help reduce waste.

7.1.2(e) Transportation

Wentworth continues to invest in resources to minimize traffic congestion and the associated air quality impacts from single-occupant vehicle commuting to and from campus. With the construction of the Apartments at 525 Huntington Avenue, Wentworth increased student housing by just over 15% of its previous total. The University encourages commuters to take alternate modes of transportation by offering subsidized MBTA passes and preferred parking for carpools in the West Lot. The Longwood Collaborative CommuteWorks program provides employees with shuttle buses, emergency ride home, rideshare matching, and other services. More than 400 bicycle parking spaces are available across campus. Wentworth has expanded its support by adding secure, covered bike shelters adjacent to Beatty Hall and within the Apartments at 525 Huntington Avenue. There are numerous transit and bus stations, Bluebikes stations, and the Southwest Corridor bike path within walking distance from the campus. As a result of these efforts, more than 90% of students either live in Wentworth housing or take sustainable commute modes to campus.

7.1.3 Training Tomorrow's Leaders in Sustainability

As part of Wentworth's vision, the University seeks to maximize the value of our graduates' contributions to a global society. Tomorrow's leaders will need multidisciplinary skills, real-world experience, and a deep understanding of environmental and social issues.

Wentworth's academic programs include more than 20 courses that focus exclusively on sustainability concepts and more than 70 additional courses related to sustainability. Students can study topics ranging from energy systems and climate change to green infrastructure and environmental justice. The University offers an environmental engineering minor, access to the COF

minor in sustainability, and co-op opportunities for hands-on experience in sustainable design, engineering, and emerging technologies.

Wentworth's Sustainability Committee, comprised of faculty, staff, and student leaders, oversees programs to engage the campus community in sustainability research and outreach. Working with partners such as the University's two student environmental organizations, the Accelerate Program and the COF Center for Sustainability, this team has led activities and projects, including annual sustainability orientation events for incoming students, zero waste pledge campaigns, Earth Hour and Earth Day festivals, Student Energy and Upcycle Design Challenges, and "Garbology" campus waste audits.

7.2 Future Goals of Sustainable Initiatives and Programs

In 2022, Wentworth convened workshops with key stakeholders to determine future planning objectives for sustainability. These facilitated sessions included reviewing the University's sustainability performance, discussing regional policy development, and exploring opportunities related to the scope of changes being proposed in the Campus Master Plan. Ideas and feedback were gathered from the Sustainability Committee, the Campus Master Planning Steering Team and consultants from various disciplines, and external stakeholders such as the Boston Water and Sewer Commission ("BWSC"), Longwood Collective, Massachusetts Water Resources Authority, and the Muddy River Restoration Project Oversight Committee ("MMOC"). Based on this input, a series of recommendations will be incorporated into IMP Projects and future campus planning to position the University to meet the City of Boston's goals for carbon neutrality by 2050.

Wentworth's Campus Master Plan included four sustainability pillars with supporting strategies that are summarized in **Figure 7.1**.

For the IMP, these recommendations have been grouped into two overarching themes:

- Green Buildings and GHG Reduction
- Climate Resiliency and Urban Ecosystem

7.2.1 Green Buildings and GHG Reduction

To support the City of Boston's GHG reduction targets, the University will continue implementing its climate action program to address existing buildings and new construction decarbonization.

7.2.1(a) Existing Buildings – Decarbonization and Electrification

Currently, Wentworth's campus-wide carbon emissions intensity is below the BERDO 2025 and 2030 carbon performance standards for university buildings. However, Wentworth is planning now to ensure its operations will comply with BERDO over the long term. To meet future GHG reduction targets, Wentworth undertook a decarbonization study of its existing buildings. This study included ASHRAE Level II energy audits of more than 80% of the campus buildings (by square feet) and an analysis of decarbonization pathways for the central power plant and steam distribution.

Wentworth's decarbonization efforts will be generally phased based on payback and incentive eligibility (in order of priority below):

- Energy efficiency (stand-alone measures and bundled measures with building renovations).
- On-campus renewable energy (solar PV and geothermal).
- Electrification of smaller/low energy use intensity ("EUI") existing buildings.
- Electrification of larger/high EUI existing buildings and power plant decommissioning (or replacement with centralized electric systems if/when technology becomes cost-effective and feasible).
- Virtual power purchase agreement if/when needed for residual electricity emissions before the BERDO compliance thresholds.

Infrastructure upgrades will be assessed as aspects of the decarbonization plan are implemented – i.e., building-level upgrades as smaller existing buildings are individually electrified, followed by more complex upgrades at high EUI buildings and the central plant. Wentworth will continue collaborating with Eversource and National Grid on electrification planning and heat pump conversion studies. The University also intends to continue participating in the ISO demand response program and anticipates peak load shaving to be an important aspect of distributed energy resources, such as on-campus solar PV.

As a university that values future-focused innovation, Wentworth will explore emerging technologies and use the campus as a living laboratory. For example, a team of faculty and students are working with external collaborators to research campus electricity demand profiles, solar PV, and microgrid technologies to help understand what's needed to manage distributed energy resources and load shedding across the campus grid. Recent publications highlight these efforts.¹⁵

7.2.1(b) New Construction – Low Carbon and Sustainable Design

Environmental Mitigation

Wentworth will strive for LEED Gold-certifiable new construction to seek a higher level of environmental performance. Following the LEED rating system ensures a balanced approach to mitigating environmental impacts ranging from climate change to human health, water resources, biodiversity, material resources, and environmental justice, in accordance with industry best practices. IMP Projects will prioritize the Integrative Process credit and Site Assessment credit so that synergies and tradeoffs can be evaluated early in design and goals can be established in alignment with the needs of campus and community stakeholders. Examples of strategies to

¹⁵ Ghanavati A, Rawlins M, Dow D, Sweeny C, Smith J. Interpretation of the Power Consumption Characterization of an Urban University Campus toward Power System Planning. *Sustainability*. 2023; 15(20):14835. <https://doi.org/10.3390/su152014835>.

S. Basnet, J. Kelley, E. Costa, A. Em, D. Shepard and D. E. Dow, "Campus Photovoltaic Integration for Carbon Emission Reduction Compliance," 2023 North American Power Symposium ("NAPS"), Asheville, NC, USA, 2023, pp. 01-05, doi: 10.1109/NAPS58826.2023.10318702.

mitigate environmental impacts are provided throughout this chapter, including continuing existing programs (**Section 7.1**) and expanding into other areas (**Section 7.2**) in response to the City of Boston's policy objectives, emerging trends, and industry advancements.

Low Carbon Design

The University will prioritize LEED credits and strategies that support low-carbon building operations, integration of renewable energy, and embodied carbon reduction. Wentworth will comply with the MA Specialized Stretch Energy Code, and the BPDA's Zero Net Carbon Building Zoning and updated Article 37 requirements (when adopted and applicable).

Future IMP Projects will reduce operational carbon through strategies such as:

- Establishing targets for building energy use intensity ("EUI") and carbon emissions intensity ("CEI") early in the design.
- Partnering with MassSave sponsors to identify, model, and incentivize energy efficiency measures that are at or go beyond code compliance.
- Utilizing passive design, high-performance envelopes, and energy recovery ventilation to minimize air leakage and heat loss.
- Prioritizing electrification/fossil fuel-free technology for space heating, water heating, and appliances where economically viable.
- Prioritizing refrigerants with a low global warming potential.
- Studying the feasibility of on-site renewable energy (solar and geothermal), battery technology, or provisions for future solar plus storage-ready design.
- Geothermal applications will be assessed for locations beneath new buildings or under adjacent open spaces based on soil conditions and where there are no obstacles from buried infrastructure.

Wentworth will reduce the embodied carbon impacts of new construction projects by evaluating structural designs, product selection, and materials reuse opportunities. These strategies will be emphasized by continuing to pursue credits within the LEED rating system, such as:

- *Construction and Demolition Waste Management* – setting goals for total waste diversion (90%+) and waste intensity early in design, planning for waste diversion, and tracking progress throughout construction
- *Building Life-Cycle Impact Reduction* – reusing building elements and incorporating salvaged and recycled content materials
- *Building Product Disclosure and Optimization* – selecting building materials designed to protect human health, conserve resources, and reduce environmental impacts across the entire product life cycle.

Beyond LEED, Wentworth can enlist its faculty with expertise in low embodied carbon materials and structural engineering to identify best practices for future projects at the University.

7.2.1(c) Transportation

Air pollution and transportation impacts are a key concern for the Wentworth community and its neighbors. According to EPA's EJScreen Tool, the environmental justice ("EJ") indexes for the Mission Hill neighborhood indicate high vulnerability to particulate matter, ozone, air toxics risks, and traffic proximity. In addition, there is a higher rate of asthma. In response to these concerns, Wentworth will adopt an innovative approach to mitigating regional air pollution through ongoing transportation demand management, a significant investment in electric vehicle infrastructure, and more resilient land use and tree canopy strategies (see **Section 7.2.2(a)**).

Thanks to Wentworth's student housing and commuter benefits programs, the majority of students either live on campus or travel via transit, biking, and walking. Approximately 33% of faculty and staff take alternative modes. Full-time drivers are only a small proportion of the overall campus population. Nearly half (48%) of Wentworth's faculty and staff drivers commute part-time due to academic or hybrid schedules. While Wentworth's contribution to peak traffic impacts is relatively low for these reasons, the University anticipates that demand for parking will remain stable given the mix of community needs (co-ops, academic schedules, family obligations, and median commute distances of ten miles).

Wentworth's IMP Projects will consolidate parking from several surface lots into new underground garages. By following the City of Boston's EV Readiness Policy, these projects will support a future transition to electric vehicles. Across the three projects—600 Parker, West Lot, and the Annex—over 180 spaces will have EV charging installed, and an additional 600+ will be EV-ready (see **Table 7.1**). Ultimately, 69% of Wentworth's total parking will have future EV charging capability.

The benefits of this transition can be estimated using the Department of Energy's AFLEET tool. Compared to a baseline scenario with internal combustion engines, 789 EVs would significantly reduce GHGs and local air pollution (see **Table 7.2**). Wentworth is working with stakeholders such as the Boston Fire Department and Eversource to ensure a safe and well-orchestrated deployment of this equipment. As new technology becomes more proven in the market, future installations may explore options for vehicle-to-grid and passive survivability, particularly when located adjacent to residential buildings or emergency services.

Multi-modal transportation will also be enhanced through the IMP (see **Figure 4.4**). Bicycle storage facilities will be added at strategic locations along the campus perimeter to enable easy connections to regional bicycle networks. Facilities will be designed similar to the bike storage unit at 600 Parker, following best practices from the City of Boston Bike Parking Guidelines and supporting micromobility by providing space and charging capability for scooters and e-bikes. Landscape design elements such as extending pedestrian paths across campus and the Front Lawn and improved crosswalks will also promote safer and more inclusive circulation routes throughout the neighborhood.

Table 7.1 Future Ready EV Parking Opportunities

Project	EV-Install Spaces	EV-Ready Spaces
600 Parker – Partially Below Grade Garage	47	197
West Lot – Below Ground	54	161
Annex – Below Ground	83	247
Total	184	605

Table 7.2 Environmental Benefits from Wentworth’s Future EV Parking

Future Scenarios	GHG Reduction	Air Pollution Reduction					
		CO	NOx	PM10	PM2.5	VOC	SOx
Near-Term (25%)	18%	23%	23%	2%	8%	23%	23%
Long-Term (100%)	78%	100%	100%	9%	36%	100%	100%

Analysis of Well-to-Wheels Petroleum Use and GHGs and Vehicle Operation Air Pollutants using Department of Energy’s Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) tool, based on Wentworth’s median vehicle miles traveled (VMT) for commuting.

7.2.2 Climate Resiliency and Urban Ecosystem

Resiliency planning efforts centered on two hazards from the 2022 Greater Boston Research Advisory Group Report: extreme heat and more intense storms (including flooding and groundwater impacts). The Wentworth team evaluated campus vulnerabilities and risks, drawing from historical events and interviews with regional stakeholders such as BWSC and the MMOC. A series of overarching strategies were then developed. For all IMP Projects, the BPDA Resiliency Checklist will be employed early in the planning process to review the hazards, identify any specific vulnerabilities, and implement the appropriate design criteria.

7.2.2(a) Open Space Land Use Analysis

Intentional land use changes and the addition of new open spaces will improve environmental quality, enhance resiliency, and promote a more walkable and activated campus community:

- Consolidation of parking from surface lots to underground garages will net a **60% reduction in impervious surface parking area**.
- Reimagining open areas will **create more than 2.5 acres of appropriately-scaled gathering spaces** with a mixture of programmed lawns, native/adaptive landscaping, and tree canopy for shade and visual interest.

These changes lead to significant environmental improvements, including:

- A **38% increase in green space area**, incorporating biodiverse landscaping and avoiding an increase in monoculture lawns.
- Adding green infrastructure and hardscape materials that serve outdoor programming needs while allowing rainwater to infiltrate below.
- Collectively, these strategies result in a **61% increase in permeable surface area**.

Overall, land use will shift toward a greener and more permeable campus, as shown on **Figure 7.2**.

7.2.2(b) Tree Canopy and Landscaping

The City of Boston's Urban Forest Plan ("UFP") identifies Mission Hill as a priority zone based on the indicators of environmental justice community status, heat event hours, and historic marginalization.

Wentworth is currently inventorying campus trees and has conducted a tree canopy assessment using the USDA Forest Service iTree software. Results indicate that approximately 16% of the campus is covered by trees. The benefits of Wentworth's tree canopy include:

- **GHG mitigation**
 - Sequestering 5 tons of carbon per year
 - Approximately 165 tons of carbon are stored in existing trees
 - Lowering building A/C energy use by reducing urban heat island effect
- **Air pollution reduction**
 - Improving air quality and health outcomes
 - Removing nearly 300 pounds of pollutants, including ozone, CO, NO_x, SO_x, and particulate matter
- **Hydrological and resiliency benefits**
 - Avoiding 163,000 gallons of stormwater runoff
 - Cooling the local microclimate through transpiration of 775,000 gallons
 - Providing shade along pedestrian routes

The University's existing tree canopy is below the UFP benchmark for Mission Hill (25%). Through the proposed landscape features in this IMP, Wentworth aims to increase tree canopy by 10% over the next ten years so that it will be just over the Mission Hill benchmark. Wentworth's target tree canopy compared with City Benchmarks is shown on **Figure 7.3**.

The following strategies will be employed to expand the tree canopy, promote biodiversity, and enhance the resiliency of Wentworth's landscape features:

- Care and preservation of existing trees
- Planting a mix of native and adaptive species in accordance with UFP recommendations
- No planting of invasive species and proactively managing any existing on campus
- Avoiding species at risk due to climate change, pests, and other factors
- Ensuring that no single species represents more than 10% of new plantings

- Creating microhabitats through pocket parks, pollinator gardens, and other design features appropriate to the campus context

7.2.2(c) Extreme Heat and Urban Heat Island Effect

In addition to the expansion of tree canopy and landscaping, Wentworth will pursue cooling strategies for hardscape and buildings to address heat concerns, as follows:

- **Hardscape Strategies:**
 - *White Concrete* – The campus standard for the last ten years has been to install white concrete rather than bituminous walkways. Approximately 79% of walkways are light-colored concrete vs. 21% bituminous. A LEED-qualifying solar reflectance will be specified in areas where concrete continues to be used.
 - *Permeable Materials* – Similar to the pavers along the Pike, this will continue to be integrated into new projects based on use profile, cost, and soil conditions.
- **Building Design Strategies:**
 - *Cool (White) Roofs* – The standard practice for flat roof replacements, and nine buildings currently have these, and future buildings will continue this practice.
 - *Architecture Shading* – Features (similar to CEIS’s vertical fins) will be incorporated where designs allow to reduce heat gain.
 - *Upgrade HVAC Equipment* – HVAC equipment will be upgraded to improve space cooling and indoor air quality:
 - Air source heat pumps and other electrification projects will provide efficient cooling as well as heating.
 - The main campus chiller plant was upgraded in 2018 and designed with capacity for future expansion. The University will investigate tying in additional buildings based on system capacity, building-level demand, and the proposed route for chilled water (tapping into existing lines or running new ones, if needed, during the Quad renovation).
 - *Support the Campus During Power Outages* – To support the campus during power outages, the following technologies will be explored:
 - Based on cost and feasibility, electrical distribution systems will be studied for microgrid readiness.
 - Battery storage opportunities at existing buildings will be evaluated in conjunction with the campus-wide solar PV assessment.
 - Potential battery locations will be determined according to where/how solar PV is tied in (at a building level or the campus electrical grid/adjacent to the Power Plant).
 - New construction projects may be evaluated for passive survivability and/or battery backup capability where appropriate, such as for residential buildings.

7.2.2(d) Stormwater Management

Wentworth is constructed on land originally functioning as a tidal basin and bisected by the Stony Brook. While the Stony Brook was culverted down Parker Street in the 1800s, the main campus still depends on this infrastructure and the surrounding Muddy River/Fens drainage. In addition, the campus is part of the Groundwater Conservation Overlay District, designed to preserve wood pile foundations and other historic structures in the region through groundwater restoration. Given this history and the vulnerabilities of citywide drainage systems, the University has proposed the following strategies to reduce runoff, enhance groundwater levels, and mitigate potential stormwater and flood impacts:

- Adding a significant amount of stormwater infiltration over time as new construction projects (with retention systems), landscaping, and green infrastructure are added (see **Figure 7.4**).
- Targeting specific areas prone to stormwater flooding for green infrastructure projects that serve a dual purpose of activating open space for recreation and increasing stormwater retention.
- Exploring opportunities for additional rainwater harvesting systems for irrigation, such as blue roofs.
- For new construction in relatively low-lying areas, the first floor of buildings can be raised, and critical mechanical equipment can be placed on upper levels.
- Implementing a preventive maintenance program to ensure building backflow prevention systems remain functional.
- Honoring the historic route of the Stony Brook when planning the placement of stormwater management features and sharing the story of the watershed and its civil engineering systems with students through educational signage.

Figure 7.1 Wentworth’s Campus Master Plan Sustainability Pillars





 Energy & GHG Reduction	 Climate Resiliency & Urban Ecosystem	 Water Resources	 Materials & Waste
<ul style="list-style-type: none"> • Existing Buildings: Energy efficiency and electrification • New Construction: Low carbon design and LEED Gold as the new target • On-Site Renewable Energy: Solar PV & geothermal • Renewable Energy Procurement: Explore options for a virtual power purchase agreement • Transportation: Expand EV charging availability Enhance bicycle and transit connections 	<ul style="list-style-type: none"> • Expand cooling capacity to existing buildings without centralized A/C • Incorporate BPDA resiliency standards for new construction • Design new residence halls for passive survivability • Design new buildings for flood resistance • Explore islanding capability for energy systems • Select reflective hardscape and roofing materials • Expand green space and tree canopy • Install green infrastructure for flood-prone areas • Harden campus infrastructure to prevent future flooding 	<ul style="list-style-type: none"> • Increase water efficiency standards • Native and adaptive plant selection • Minimize synthetic fertilizers and pesticides • Expand rainwater harvesting • Install smart irrigation systems or no irrigation for new construction • Cooling tower optimization 	<ul style="list-style-type: none"> • Minimize construction waste • Reduce life cycle impacts of buildings • Optimize building design to reduce operational waste • Create a new, centrally-located STRIVE recycling hub • Dedicate areas for re-use of academic program materials • Dedicate areas for students experiencing hardship (food pantry and household items) • Adopt healthy materials standards

Figure 7.2 Permeable vs. Impervious Conditions

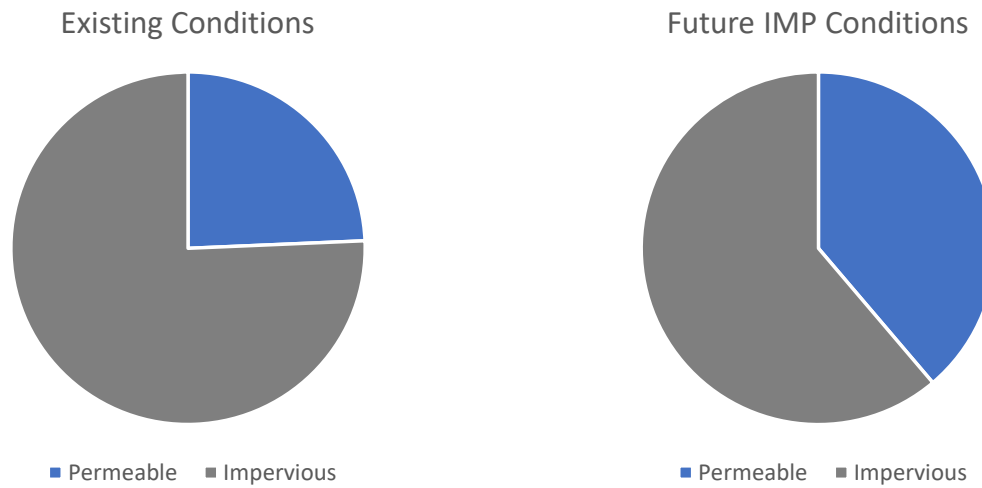


Figure 7.3 Wentworth Tree Canopy versus City Benchmarks

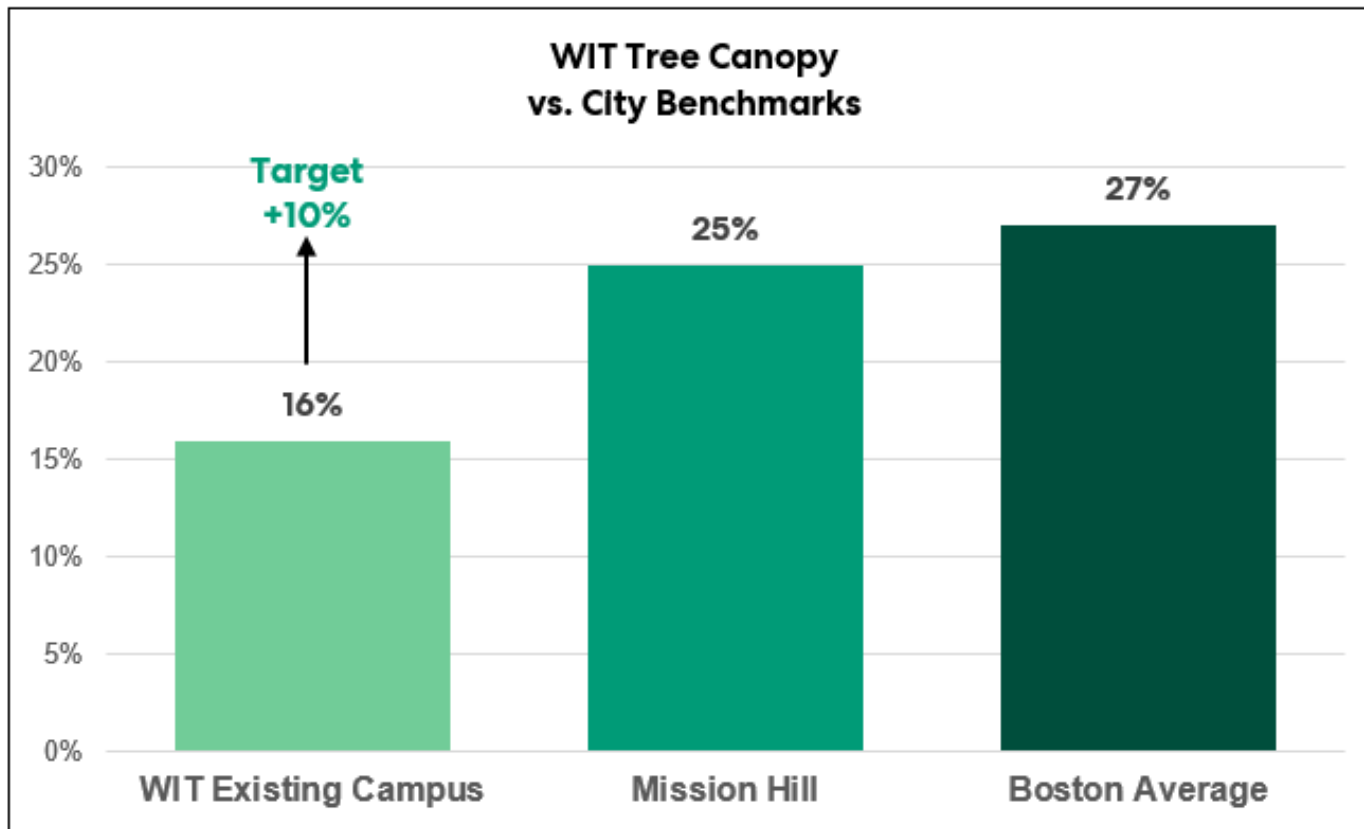


Figure 7.4 Stormwater Management Strategies

