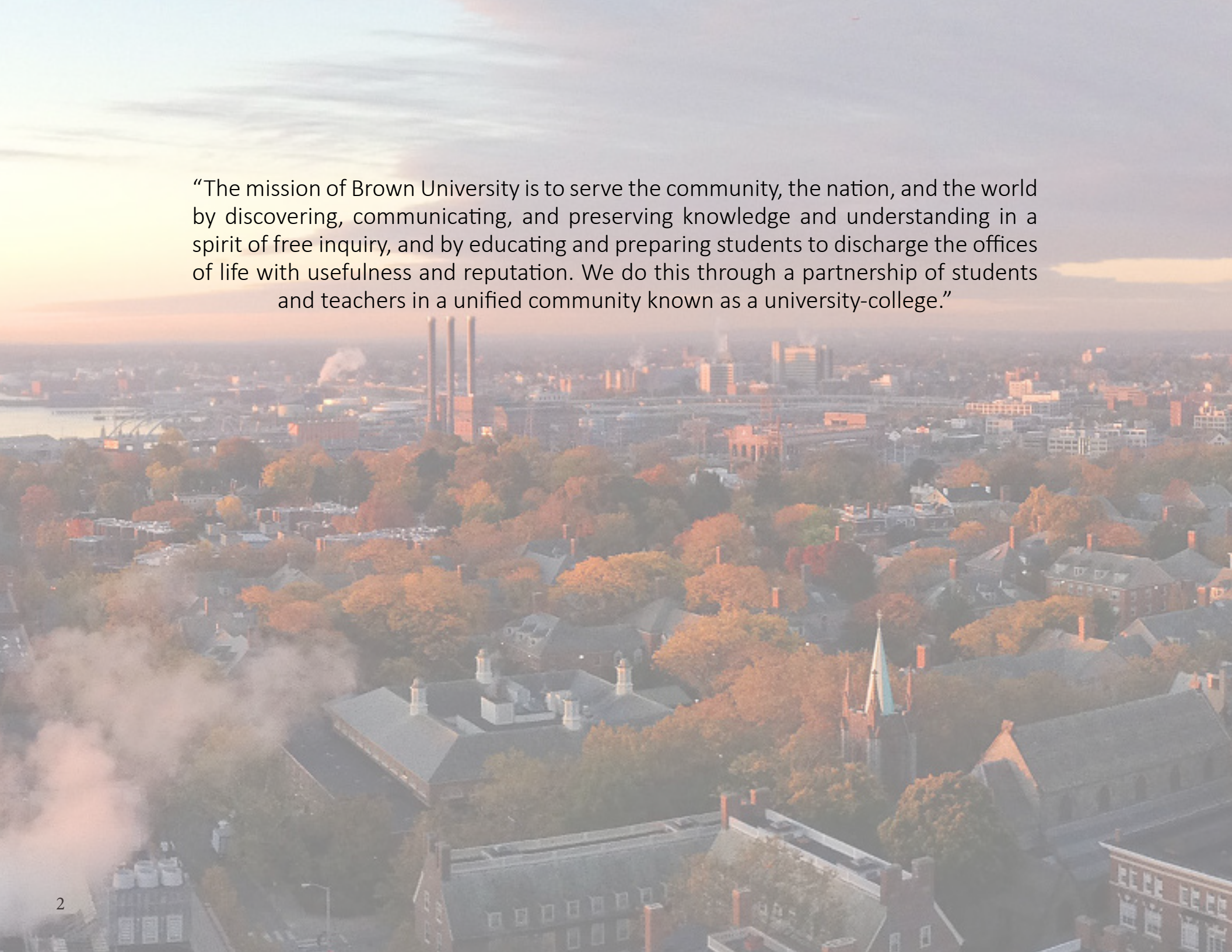
BROWN

INSTITUTIONAL MASTER PLAN 2023

AMENDMENT #1

SUBMITTED OCTOBER 15, 2026



"The mission of Brown University is to serve the community, the nation, and the world by discovering, communicating, and preserving knowledge and understanding in a spirit of free inquiry, and by educating and preparing students to discharge the offices of life with usefulness and reputation. We do this through a partnership of students and teachers in a unified community known as a university-college."



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PLANNING CONTEXT

BUILDING ON DISTINCTION (BROWN'S STRATEGIC PLAN)

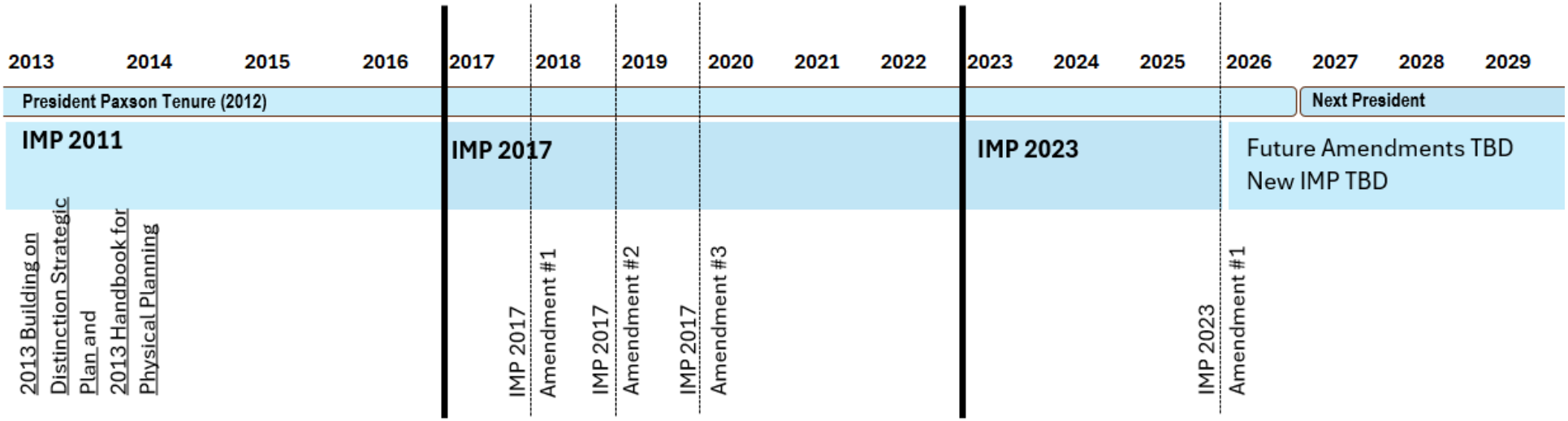
https://distinction.brown.edu/sites/g/files/dprerj561/files/BuildingOnDistinctionOct262013.pdf

In 2013, at the outset of President Christina Paxson's tenure, the Corporation of Brown University approved the Building on Distinction strategic plan, which established a far-reaching set of goals to enhance the quality of our academic and campus environment. This plan is constantly monitored and adjusted, and it continues to focus the University's efforts in its pursuit of excellence.

HANDBOOK FOR PHYSICAL PLANNING

In 2013, the Handbook for Physical Planning was created as a corresponding physical framework for Brown's strategic plan. This handbook serves as a guide for decisions about campus planning and design. It focuses on the following interdependent planning principles, which have provided (and continue to provide) a framework for planning the Brown University campus:

- Strengthen the physical campus as an analog for the Open Curriculum
- Prioritize academic uses in the core
- Celebrate the Brown scale
- Energize the core with a mixture of uses
- Engage Thayer Street
- Connect the campus
- Consolidate landholdings and catalyze partnerships



PLANNING CONTEXT

COMMUNITY ENGAGEMENT

The University's planning process is open and iterative, with regular opportunities for community engagement. Brown staff members meet regularly with neighborhood organizations, elected officials, and allied institutions to share Brown's development plans and solicit feedback.

The public engagement process for this Institutional Master Plan Amendment includes the following meetings:

6/23/26	City of Providence Pre-Application Meeting
9/14/26	City of Providence Planning Department
9/15/26	Benevolent/Brook St neighbors
9/22/26	Ward 1 Community Meeting
9/24/26	Ward 2 Community Meeting
9/30/26	Brown-hosted Community Meeting
10/1/26	Local Elected Officials Meeting
10/5/26	College Hill Neighborhood Association
10/6/26	Thayer St District Management Association
10/13/26	Jewelry District Association
10/14/26	Brown-hosted Community Meeting

CAMPUS FOOTPRINT



Galen V. Henderson Admission Welcome Center


Penner Field House


Sondheim Amphitheater at Ruth J. Simmons Quadrangle

SEEKING APPROVAL
- Central Hub
- Economics Building

PROJECTS RECENTLY COMPLETED
- Haffenreffer Museum of Anthropology Relocation and Renovation
- Penner Field House
- Churchill House Renovation and Addition
- Galen V. Henderson Admission Welcome Center Renovation
- Pembroke Hall Renovation
- Sondheim Amphitheater at Ruth J. Simmons Quadrangle

PROJECTS CURRENTLY UNDER CONSTRUCTION
- Danoff Laboratories
- Barus and Holley Interior Renovation
- Lassonde Innovation and Design Hub

RECENT CHANGES IN REAL ESTATE HOLDINGS

Since the 2023 Institutional Master Plan, the University has made changes in property holdings reflecting the planning principles in the Handbook for Physical Planning:

Acquisitions:
- 58-60 Ship Street
- 350 Eddy Street -- *Brown occupied portion*
- 219 Richmond Street
- 110 Elm Street
- 131 Brown Street -- *Brown to Brown*
- 277 Brook Street -- *Brown to Brown*

Dispositions:
- 20 Olive Street
- 271 Thayer Street
- 200 Hope Street
- 89 Power Street
- 195 Angell Street -- *(early 2027)*
- 126 Power Street -- *Brown to Brown*
- 172 Cushing Street -- *under consideration for potential ground lease*
- 272 Thayer Street -- *under consideration for potential ground lease*

SEEKING APPROVAL

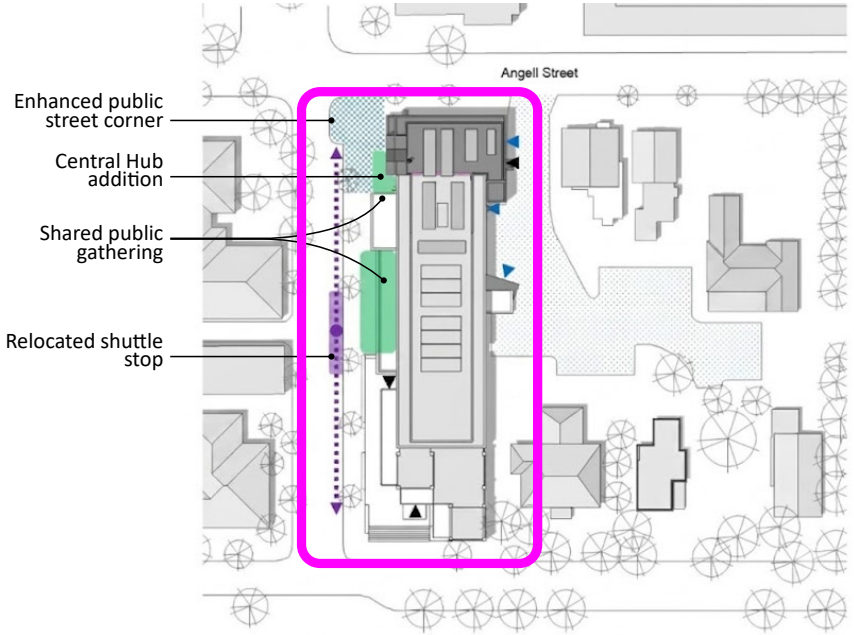
CENTRAL HUB

Brown will advance its in-progress transition away from fossil fuels through a new multi-phase initiative to upgrade how the campus creates and distributes heat. The first phase of the new initiative — the Sustainable Thermal Energy Program — will build on Brown's progress to date and reduce campus greenhouse gas emissions by an additional 8% to 10% while laying the groundwork for future electrification and progress toward the 2040 net-zero goal.

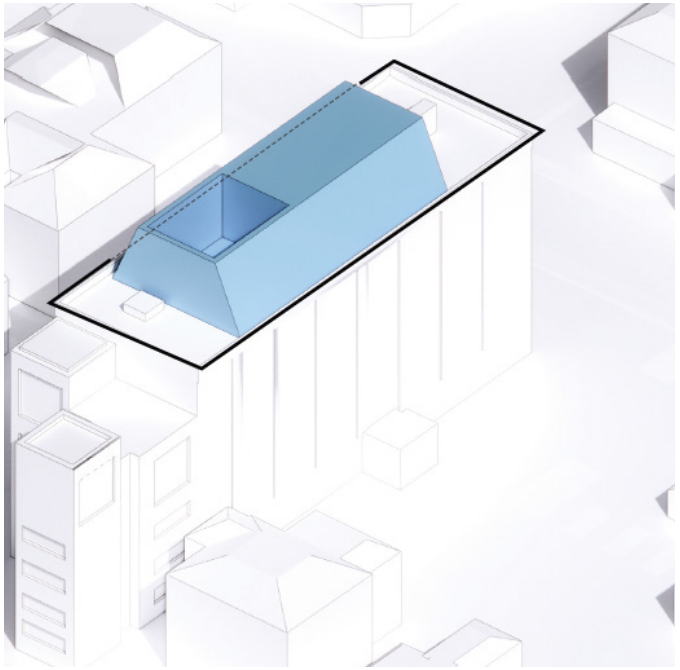
In order to realize the goals outlined as part of the initiative, the campus requires a new central thermal energy hub, which will serve as the centerpiece of Phase I of the Sustainable Thermal Energy Program, a multi-year initiative that will establish a microgrid — a unified, resilient, highly efficient campus heating network — with an eye toward an eventual transition from natural gas to full electrification. The hub will serve as the primary energy generation core and automated control center for the full thermal network.

The new hub will be built as an addition to the existing Page-Robinson Hall. Two options are being considered. One option is an up-to 14,000 gross square foot ground-based addition on the Angell Street side of the existing building. The other option is a rooftop structure. The rooftop structure will require zoning relief in the form of a dimensional variance from some of the setback requirements for rooftop mechanical equipment. Brown requests approval for either option. If the rooftop option is chosen, then a future application will be made to the Zoning Board.

No existing building demolitions or relocations are proposed as part of this project.



Option 1: vertical addition



Option 2: Rooftop structure

SEEKING APPROVAL

ECONOMICS BUILDING

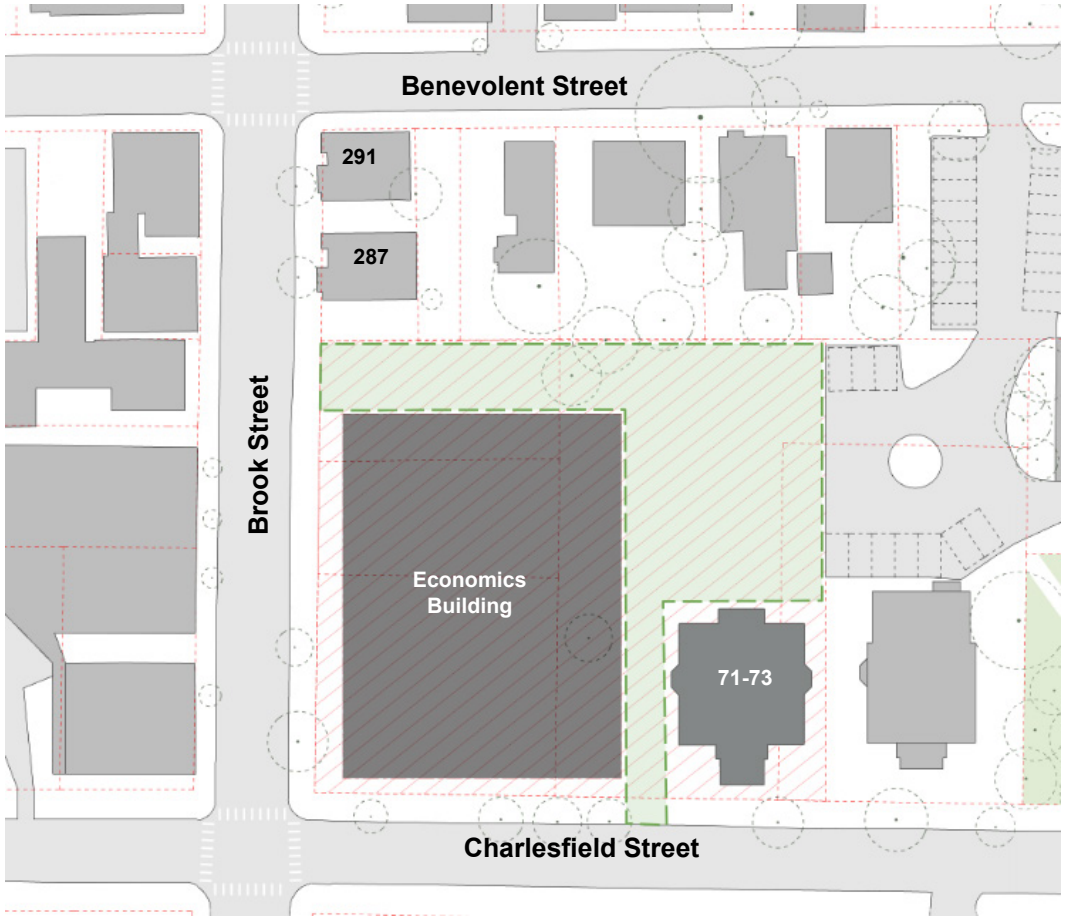
Since 1828, Brown's Department of Economics has been home to scholars, including the winner of the 2025 Nobel Prize in Economics, who have made a global impact on economic theory and policy. Their pioneering work has used data to answer critical questions on topics such as government programs, social mobility, health and medicine, education, politics, media, and infrastructure.

Brown's economics faculty, staff, and students are currently housed in five separate buildings. A dedicated building near other social science units, notably the Watson School of International and Public Affairs and the Department of Political Science, will unify the department's people and activities. It will also position the department to expand its scholarship and teaching and to prepare students for careers with even greater impact.

The new building will be located on the block bounded by Benevolent Street to the north, Hope Street to the east, Charlesfield Street to the south, and Brook Street to the west. After an in-depth analysis, this site was chosen for its proximity to the Watson School, which has foundational connections to the economics program, curriculum, and faculty.

The proposed program will consist of 56,000 gross square feet, occupying up to four stories and will conform with dimensional standards and heights of the I-2 Educational Institutional District.

The development will include sustainable features that contribute to the University's campus-wide energy conservation and carbon reduction goals.



Project site

SEEKING APPROVAL

ECONOMICS BUILDING ENABLING

LOCAL CONTEXT

Brown engaged the Public Archaeology Laboratory (PAL) to research the affected residential properties to HABS Standard I. The research establishes the historic, cultural, and architectural/engineering context for each building and outlines its history, providing a basis for evaluating its significance.

The residential buildings on Brook Street are listed in the National Register of Historic Places as contributing resources to the College Hill National Register Historic District. None of the buildings are listed in the College Hill National Historic Landmark District or within the City of Providence's College Hill Local Historic District.

Based on PAL's evaluation and feasibility, Brown plans to make 277 Brook Street and 281-283 Brook Street available for sale to buyers willing, qualified and able to move the existing structures from their present sites to new locations and continue their use. If those efforts are unsuccessful, both will be offered to organizations for architectural salvage prior to demolition.

PROPOSED RESTORATION:

287 and 291 Brook Street

Both houses are examples of the Second Empire style, built in 1886 by Alexander Gorham, an African-American real estate developer. Gorham, along with his wife Caroline, made significant cultural contributions to Providence. As part of the restoration, these buildings may be set farther back from the street to allow for a more ample sidewalk.

PROPOSED DEMOLITION:

75 Charlesfield Street

The building was erected in 1967 as Memorial Hall for Bryant College. It presently houses Brown's Department of Public Safety and Emergency Management, which will be relocated to two new locations.

PROPOSED RELOCATION:

71-73 Charlesfield Street

This building is situated at the corner of Brook Street and Charlesfield Street. Brown plans to relocate this building to the site currently occupied by 75 Charlesfield Street, once that building has been demolished.

PROPOSED RELOCATION OR DEMOLITION:

277 Brook Street

The house is a two-and-one-half-story, three-bay-by-three-bay, wood-frame, vernacular Italianate-Queen Anne-style dwelling constructed between 1882–1892.

281-283 Brook Street

The house is a two-and-one-half-story, three-bay-by-four-bay, wood-frame, two-family, Second Empire-style residence constructed in 1882–1895.



287 and 291 Brook Street



75 Charlesfield Street



71-73 Charlesfield Street



277, 281-283 Brook Street

CAMPUS INFRASTRUCTURE

TRANSPORTATION AND PARKING

CENTRAL HUB

The new central hub is not expected to affect existing traffic and parking patterns once construction is complete. A minor, temporary shift in traffic is expected during construction.

ECONOMICS BUILDING

The project will result in a net decrease in vehicle traffic on the streets adjacent to the building site, because the reduced parking supply will lower local demand. The spaces being removed are currently assigned to the Department of Public Safety and Emergency Management (DPSEM). DPSEM will relocate, and its staff will be assigned parking at the department's new locations. Overall campus parking demand will continue to be met within the existing supply.

The project will result in a net increase in pedestrians crossing Brook Street at its intersection with Benevolent Street. A new four-way stop at this intersection will accommodate the additional pedestrian traffic and improve vehicle flow, resulting in smoother traffic with less congestion.



APPENDIX

Memorandum

To: City of Providence Planning Department
444 Westminster Street
Providence, RI 02903

Date: 10/07/2026

Project #: 203242.00

From: Robert Clinton, PE
Senior Project Manager - Transportation

Re: Institutional Master Plan
Transportation Report Update
Brown University
Providence, Rhode Island

Institutional Master Plan
Transportation Report Update

As part of the Brown University 2026 Institutional Master Plan Update submission to the City of Providence, Brown University has requested VHB to provide civil engineering services for the associated transportation components. The Institutional Master Plan update includes two new campus projects ("New Projects"), specifically: the Economics Building at Parking Lot 57 (Lot 57) and the Central Hub at Parking Lot 17 (Lot 17). VHB has conducted a traffic and parking assessment to evaluate the potential transportation, traffic, and parking impacts/issues associated with the proposed construction of the two projects listed above. Please note that a Comprehensive Transportation Study was filed with the City of Providence in 2023 as part of Brown's Institutional Master Plan (IMP); therefore, this transportation assessment is an update to the 2023 study. It should also be noted that VHB completed previous Transportation Studies dating back to before the COVID 19 pandemic; therefore, providing comparative data and analysis over time.

Brown University will be removing or reconfiguring the following parking lots (resulting in the elimination of several off-street parking spaces) to construct the following projects as part of this IMP Update.:

- Parking Lot 17 – Central Hub Site
- Parking Lot 57 - Economics Building Site

In addition to these parking lots, the Power Street Garage (Lot 68) was reviewed to assess the current peak occupancy and availability to accommodate the parking demand in the lots being displaced by the proposed projects listed above. The Power Street garage appears to be underutilized and there are available spaces that can be used to accommodate all of the parking spaces being eliminated by the proposed projects combined. While the Central Hub project is further away from the Power Street Garage, other parking lots, and/or on-street parking closer to any lost spaces can be redistributed to make room near the impacted parking lot to better accommodate displaced parking.

VHB has identified the location, amount, designations, and any restrictions of parking in these off-street parking lots serving the Brown University Campus. VHB has also conducted a general parking supply/demand analysis of the lots listed above. VHB has performed occupancy counts for each lot during typical weekday peak periods. The counts were performed on Tuesday, April 28, 2026. In addition to performing these occupancy counts, Brown University has provided information regarding occupancy of these parking lots based on over 300 counts.

Brown University has also added 76 new parking spaces to the campus since the last IMP. These new parking spaces will more than offset the loss of parking due to the proposed projects.

VHB also collected peak hour traffic data at the intersections adjacent to the parking lots that will be impacted by these projects. The parking lots that will be eliminated will experience a reduction in traffic traveling through the adjacent intersections and the Power Street Garage (Lot 68) will experience an increase in traffic traveling through the adjacent intersections from the redistribution of parking to the Power Street Garage.

Existing Traffic and Parking Conditions

VHB has performed an inventory of the existing conditions of the intersections surrounding the proposed development sites. The inventory at the intersections included noting the number of lanes, traffic control, and other appurtenances that impact traffic and pedestrian flow. The inventory also included obtaining existing traffic counts and pedestrian counts during weekday morning and afternoon peak periods at the following intersections:

- Brown Street at Angell Street (Central Hub Project – **Figure 1**)
- Brook Street at Benevolent Street (Econ Project - **Figure 2** and **Figure 3** pedestrian counts)
- Hope Street at Benevolent Street (Econ Project - **Figure 2**)
- Brook Street at Charlesfield Street (Econ Project - **Figure 2** and **Figure 3** pedestrian counts)
- Hope Street at Charlesfield Street (Econ Project - **Figure 2**)
- Thayer Street at Power Street (Relocated Parking to Power Street Garage – **Figure 4**)
- Brook Street at Power Street (Relocated Parking to Power Street Garage – **Figure 4**)
- Thayer Street at Williams Street (Relocated Parking to Power Street Garage – **Figure 4**)
- Brook Street at Williams Street (Relocated Parking to Power Street Garage – **Figure 4**)

Pedestrian counts were performed at all intersections; however, the pedestrian volumes at the Brook Street intersections with Benevolent Street and Charlesfield Street are projected to experience the greatest increase in pedestrian volumes due to the proposed Economics Building Project. The pedestrian volumes at these two intersections are shown in **Figure 3**.

Based on traffic volume information and field observations, VHB analyzed existing traffic operations at the intersections listed above using the latest version of Synchro software (using Highway Capacity Manual methodology). Levels of service and volume-to-capacity rates were assessed for the study area intersection for weekday morning and weekday afternoon peak hours for existing conditions. The extent and nature of any deficiencies have been identified.

Pedestrian counts were also performed at all study area intersections. The Brook Street intersections with Benevolent Street and Charlesfield Street are projected to experience the greatest increase in pedestrian volumes due to the proposed Economics Building Project. The pedestrian volumes at these two intersections are shown in **Figure 3**. The need for proposed mitigation to accommodate the projected increase in pedestrian crossings at these intersections is discussed in the Future Traffic Conditions section.

VHB has also performed a review of the parking lots impacted by the proposed construction of the Central Hub and Economics Building and the proposed lot where lost parking can be accommodated during construction and after occupancy.

Existing Traffic Analysis

The results of the unsignalized intersection capacity analyses for the unsignalized intersections within the study area are summarized in **Table 1**.

Table 1 Unsignalized Intersection Capacity Analysis

Location	Period	Lane Group	Existing Condition			
			Dem [1]	Del [2]	LOS [3]	Q [4]
Brown St at Angell St	AM	All Way	-	10	A	-
	PM	All Way	-	11	B	-
Brook St at Benevolent St	AM	WBLTR	16	11	B	2
	PM	WBLTR	30	10	B	4
Hope St at Benevolent St	AM	All Way	-	8	A	-
	PM	All Way	-	8	A	-
Brook St at Charlesfield St	AM	All Way	-	8	A	-
	PM	All Way	-	8	A	-
Hope St at Charlesfield St	AM	EBLTR	25	11	B	3
	PM	EBLTR	24	11	B	3
Thayer St at Power St	AM	All Way	-	8	A	-
	PM	All Way	-	9	A	-
Brook St at Power St	AM	All Way	-	9	A	-
	PM	All Way	-	10	A	-
Thayer St at Williams St	AM	All Way	-	7	A	-
	PM	All Way	-	7	A	-
Brook St at Williams St	AM	All Way	-	8	A	-
	PM	All Way	-	8	A	-

Source: VHB using Synchro 11 software.
1 Dem- traffic volume by movement
2 Del. - average delay in seconds per vehicle
3 LOS - level of service
4 Q – 95th percentile queue length, feet
EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; R = right; T = thru; L= left

Brown Street at Angell Street

Brown Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Angell Street is a one lane one-way westbound roadway. Brown Street intersects Angell Street from the north and south to form a three-way stop condition (there is no eastbound approach because Angell Street is one-way westbound). The intersection operates at LOS A during the weekday morning peak hour and LOS B during the weekday afternoon peak hour as shown in **Table 1**. The projected 95th percentile queues during the peak hour are projected to be less than one vehicle.

Brook Street at Benevolent Street

Brook Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Benevolent Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. There are stop signs on the Benevolent Street east and west approaches with no traffic control on the Brook Street north and south approaches. The westbound approach operates at LOS B during the weekday morning and afternoon peak hours as shown in **Table 1**. The projected 95th percentile queues during the weekday peak hours are projected to be less than one vehicle.

Hope Street at Benevolent Street

Hope Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Benevolent Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. The Hope Street at Benevolent Street intersection is controlled by stop conditions on all approaches. The intersection operates at LOS A during the weekday morning and afternoon peak hours as shown in **Table 1**.

Brook Street at Charlesfield Street

Brook Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Charlesfield Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. There are stop signs on all approaches. The intersection operates at LOS A during the weekday morning and afternoon peak hours as shown in **Table 1**.

Hope Street at Charlesfield Street

Hope Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Charlesfield Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. There are stop signs on the Charlesfield Street east and west approaches with no traffic control on the Hope Street north and south approaches. The eastbound approach operates at LOS B during the weekday morning and afternoon peak hours as shown in **Table 1**. The projected 95th percentile queues during the weekday peak hours are projected to be less than one vehicle.

Thayer Street at Power Street

On the north side of Power Street, Thayer Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. South of Power Street, Thayer Street is a one-lane, one-way northbound roadway from Arnold Street to Power Street. Power Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. There are stop signs on all approaches. The intersection operates at LOS A during the weekday morning and afternoon peak hours as shown in **Table 1**.

Brook Street at Power Street

Brook Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Power Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. The Brook Street at Power Street intersection is controlled by stop conditions on all approaches. The intersection operates at LOS A during the weekday morning and afternoon peak hours as shown in **Table 1**.

Thayer Street at Williams Street

Thayer Street is a one-lane, one-way northbound roadway from Arnold Street to Power Street. Williams Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. The Brook Street at Power Street intersection is controlled by stop conditions on the eastbound, westbound, and northbound approaches. There is no southbound approach because Thayer Street is one-way northbound at this intersection. The intersection operates at LOS A during the weekday morning and afternoon peak hours as shown in **Table 1**.

Brook Street at Williams Street

Brook Street is a two-lane (one lane in each direction) roadway running in a generally north-south direction within the project area. Williams Street is a two-lane (one lane in each direction) roadway running in a generally east-west direction within the project area. The Brook Street at Power Street intersection is controlled by stop conditions on all approaches. The intersection operates at LOS A during the weekday morning and afternoon peak hours as shown in **Table 1**.

Parking Inventory and Occupancy

In order to perform an assessment of the potential parking impacts and potential issues associated with the proposed construction of the Central Hub and Economics Building, it is necessary to understand the existing parking demands at the existing parking lots impacted (Lot 17 and Lot 57). It is also important to assess the amount of parking available in other lots (Power Street Garage - Lot 68) that are expected to accommodate the lost parking. Brown University has also added 76 parking spaces since the last IMP. This includes adding spaces in the Jewelry District in a parking lot at 218 Chestnut Street, spaces in the Innovation District Garage, and on-street spaces on Richmond Street and Elm Street. This will result in a net increase in parking after the loss in parking from the proposed projects. VHB has performed the following assessment of existing parking conditions.

Parking Lot 68 – Power Street Garage

The Power Street Garage consists of 410 total parking spaces and appears to be underutilized for parking; therefore, VHB performed peak hour occupancy counts to determine the amount of available parking that is available to accommodate the loss of parking spaces projected from the Central Hub project and construction of the new Economics Building. The lot consists of 1 accessible space, 4 electric vehicle spaces, 1 Brown University Police Department CG516 space, 1 Plate Number BV space, 13 Brown University Police Department Spaces, 1 parking Mobile Lab space, and 2–15-minute visitor spaces. The other spaces are not signed. Based on parking occupancy counts, there were 37 vehicles parked in this lot during the morning peak and 46 vehicles parked during the afternoon peak periods observed. This is consistent with the parking occupancy data collected by Brown University.

Parking Lot 17 – Proposed Central Hub

This project includes construction of the new Central Hub, an addition to Page-Robinson Hall. Lot 17 consists of 6 accessible spaces, 2 electric Brown Fleet spaces, 1 Zipcar space, and 5 spaces designated as parking for 86 Waterman only. Based on parking occupancy counts, there were only 5 vehicles parked in this lot during peak periods observed. The Power Street Garage (Lot 68) can easily accommodate any temporarily displaced vehicles during construction. If any parking spaces are eliminated, parking lots and/or on-street parking near Lot 17 can be made available by redistributing parking users to make room closer to the Central Hub Site to better accommodate displaced parking.

The Central Hub project is not projected to have any impact on traffic operations at the adjacent intersections. As stated in the Existing Traffic Conditions section, the Brown Street at Angell Street intersection operates at LOS A during the morning peak hour and LOS B during the afternoon peak hour and is projected to operate at the same levels of service after completion of the Central Hub project.

Parking Lot 57 – Proposed Economics Building

This project includes construction of a new Economics Building. Lot 57 consists of 1 accessible space, 4 electric vehicle spaces, 1 Brown University Police Department CG516 space, 1 Plate Number BV space, 13 Brown University Police Department Spaces, 1 parking Mobile Lab space, and 2–15-minute visitor spaces. Based on parking occupancy counts, there were 37 vehicles parked in this lot during the morning peak and 46 vehicles parked during the afternoon peak periods observed. This is consistent with the parking occupancy data collected by Brown University. The Power Street Garage (Lot 68) can easily accommodate any temporarily displaced vehicles during construction and the permanent loss of parking spaces after construction of the Economics Building.

New Parking – Jewelry District, Innovation District Garage, and On-Street Parking

Since the last IMP Brown University has added the following spaces:

- 45 parking spaces in the Jewelry District in the 218 Chestnut Street parking lot
- 15 parking spaces in the Innovation District Garage
- 16 on-street parking spaces on Richmond Street and Elm Street

The 76 parking spaces acquired since the last IMP will more than offset the spaces lost in the construction of the proposed projects.

Future Traffic and Parking Conditions

VHB has performed an assessment of the impacts that the proposed Central Hub and Economics Building projects will have on traffic and parking. The following is a summary of the findings.

Future Traffic Analysis

As stated in the Existing Traffic Analysis Section, VHB analyzed existing traffic operations at the intersections surrounding the proposed projects using the latest version of Synchro software (using Highway Capacity Manual methodology). Levels of service and volume-to-capacity rates were assessed for the study area intersection for weekday morning and weekday afternoon peak hours for existing conditions. The analysis showed that all study area

intersections currently operate at level of service (LOS) B or better during the morning and afternoon peak periods. The following is a qualitative assessment of the traffic impacts of the proposed projects.

Central Hub

The Central Hub project will result in the temporary loss of parking during construction; however, it is not expected to result in the permanent elimination of any parking spaces located in Lot 17. The Central Hub project will result in a minor shift in traffic during construction and no impact on traffic after the project is completed. As noted in the Existing Conditions section, the Brown Street at Angell Street intersection operates at LOS A during the weekday morning peak hour and LOS B during the weekday afternoon peak hour under existing conditions and the projected 95th percentile queues during the peak hour are less than one vehicle. It is projected that the intersection will continue to operate at the same LOS during construction and after construction.

Economics Building

The construction of the Economics Building will result in the loss of 47 parking spaces located in Lot 57. This will result in a reduction in traffic on the roadways and intersections immediately adjacent to Lot 57. These intersections include the Benevolent Street intersections with Brook Street and Hope Street and the Charlesfield Street intersections with Brook Street and Hope Street. These intersections operate at LOS B or better during the weekday morning and afternoon peak hour under existing conditions and the projected 95th percentile queues during the peak hour are less than one vehicle. It is projected that the intersections will continue to operate at the same LOS after construction.

The construction of the Economics Building is projected to result in a decrease in traffic traveling to and from the site; however, there is projected to be an increase in pedestrian traffic along the adjacent streets. Pedestrian counts were performed at the Brook Street intersections with Benevolent Street and Charlesfield Street. These intersections are projected to experience the greatest increase in pedestrian volumes due to the proposed Economics Building Project. The pedestrian volumes at these two intersections are shown in **Figure 3**. The need for proposed mitigation to accommodate the projected increase in pedestrian crossings at these intersections were considered.

Due to the increase in pedestrian traffic, it is recommended that installation of stop signs be considered on the Brook Street northbound and southbound approaches to the intersection with Benevolent Street, making the intersection an all-way stop. VHB has reviewed the existing peak hour traffic, pedestrian, and bike volumes, and based on the standard criteria for all-way stop sign installation, the Brook Street and Benevolent Street intersection does not currently meet the warrants. The peak hour volumes are near the threshold; therefore, the projected increase in pedestrian and bicycle traffic may meet the threshold. It should also be noted that the intersections on Brook Street located to the north and south (George Street and Charlesfield Street, respectively) are all-way stops and it is inconsistent and confusing that the Brook Street at Benevolent Street intersection is not an all-way stop. If the Brook Street at Benevolent Street intersection is changed to an all-way stop it is projected to operate at LOS A during the morning and afternoon peak periods. It should be noted that the Benevolent Street westbound approach currently operates at LOS B and is projected to operate at LOS A if an all-way stop condition is implemented.

The Brook Street at Charlesfield Street intersection is already a four way stop and is projected to continue to operate at LOS A during the morning and afternoon peak periods.

Parking Lot 68 – Power Street Garage

The Power Street garage was observed to be underutilized and there are available spaces that can be used to accommodate the parking spaces being eliminated by the proposed projects. This will result in a minor increase in traffic traveling through the adjacent intersections. These intersections include the Power Street intersections with Thayer Street and Brook Street and the Williams Street intersections with Thayer Street and Brook Street. These intersections currently operate at LOS A. It is projected that the intersections will continue to operate at the same LOS after construction.

Future Parking Analysis

The Central Hub project will result in the temporary loss of parking during construction in Lot 17; however, it is not expected to result in the permanent elimination of parking spaces. The construction of the Economics Building will result in the loss of approximately 47 parking spaces located in Lot 57.

The 410 space Power Street Garage appears to be underutilized for parking, which was confirmed by peak hour occupancy counts performed by VHB. It was determined that there is an abundance of available parking to easily accommodate the loss of parking projected by the Central Hub project and construction of the new Economics Building. This is consistent with the parking occupancy data collected by Brown University.

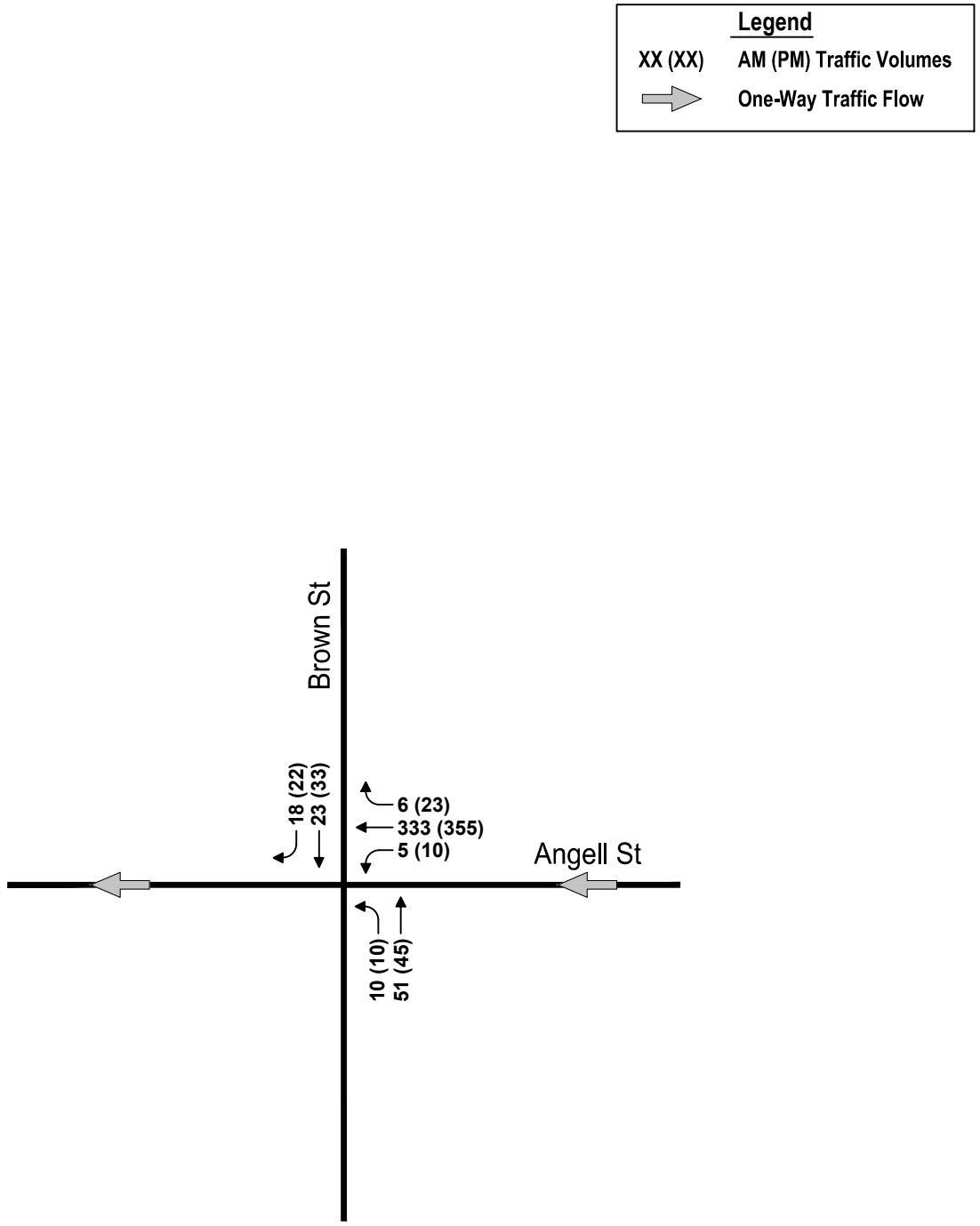
Brown University has also added 76 parking spaces since the last IMP, which will more than offset the spaces lost in the construction of the proposed projects.

Summary

The Central Hub project will result in the temporary loss of a few parking spaces during construction; however, it is not expected to result in the permanent elimination of any parking spaces located in Lot 17. Any temporary loss in parking can easily be accommodated at the Power Street Garage (Lot 68) and/or on-street parking near Lot 17 can be made available by redistributing parking users to make room closer to the Central Hub Site to better accommodate displaced parking. The Central Hub project is not projected to have any impact on traffic operations at the adjacent intersections.

The construction of the Economics Building will result in the loss of 47 parking spaces located in Lot 57. The Power Street Garage (Lot 68) can easily accommodate the permanent loss of parking spaces after construction. Brown University has also acquired 76 parking spaces since the last IMP which will more than offset the spaces lost in the construction of the proposed projects. The construction of the Economics Building is projected to result in a decrease in traffic traveling to and from the site because of the elimination of Lot 57; however, there is projected to be an increase in pedestrian traffic along the adjacent streets. Due to the increase in pedestrian traffic, it is recommended that installation of stop signs be considered on the Brook Street northbound and southbound approaches to the intersection with Benevolent Street, making the intersection an all-way stop. The peak hour volumes are near the threshold; therefore, the projected increase in pedestrian and bicycle traffic may meet the threshold. It should also be noted that the intersections on Brook Street located to the north and south (George Street and Charlesfield Street, respectively) are all-way stops and it is inconsistent and confusing that the Brook Street at Benevolent Street intersection is not an all-way stop. If the Brooks Street at Benevolent Street intersection is changed to an all-way stop the intersection is projected to operate at LOS A.

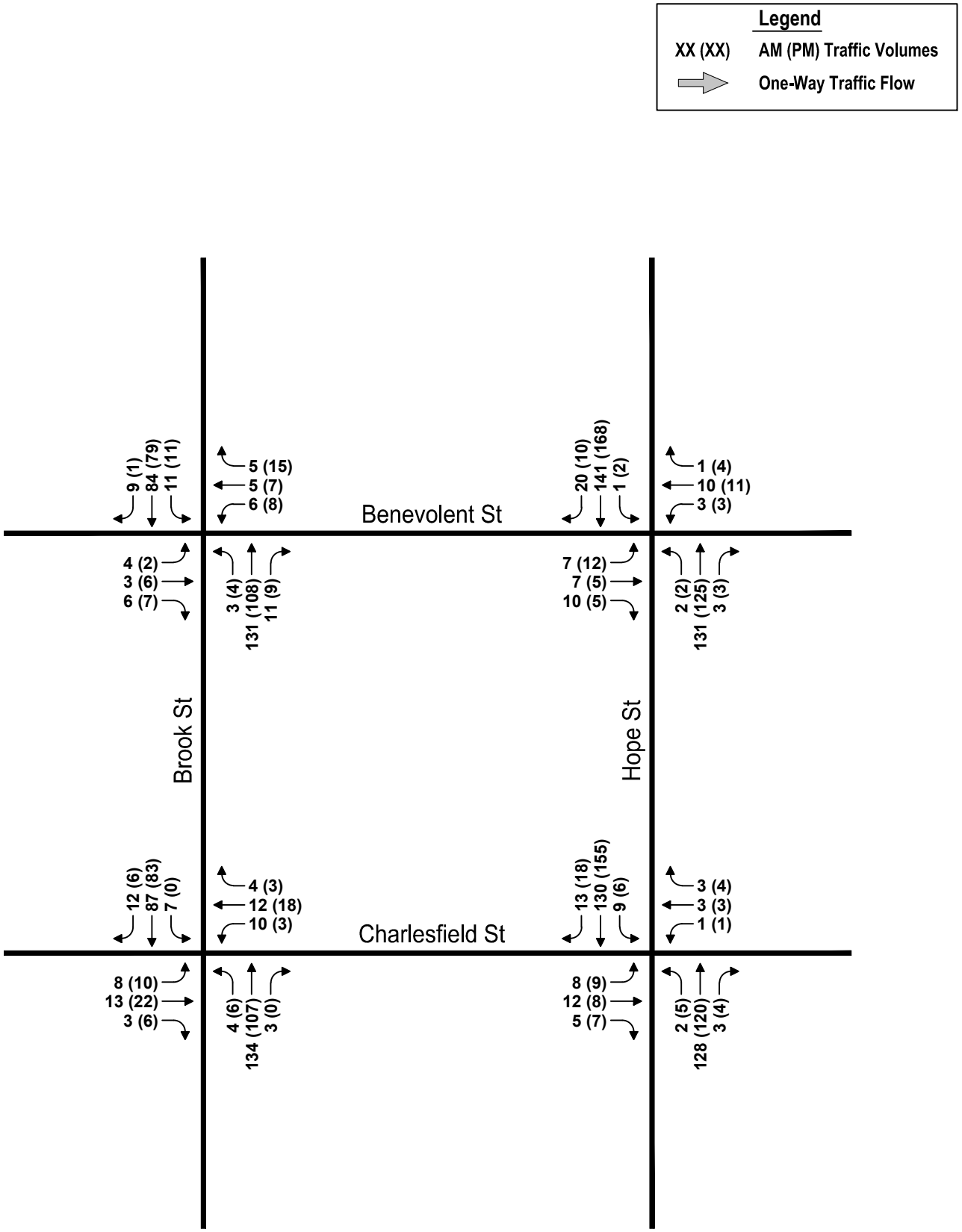
In summary, traffic operations at all intersections are projected to operate comparable to existing conditions (LOS B or better) and any lost parking spaces can be accommodated at the Power Street Garage (Lot 68).



Not to Scale

2026 Existing Morning and Afternoon Peak Hour Traffic Volumes
Central Hub Project
Brown University
Providence, Rhode Island

Figure 1

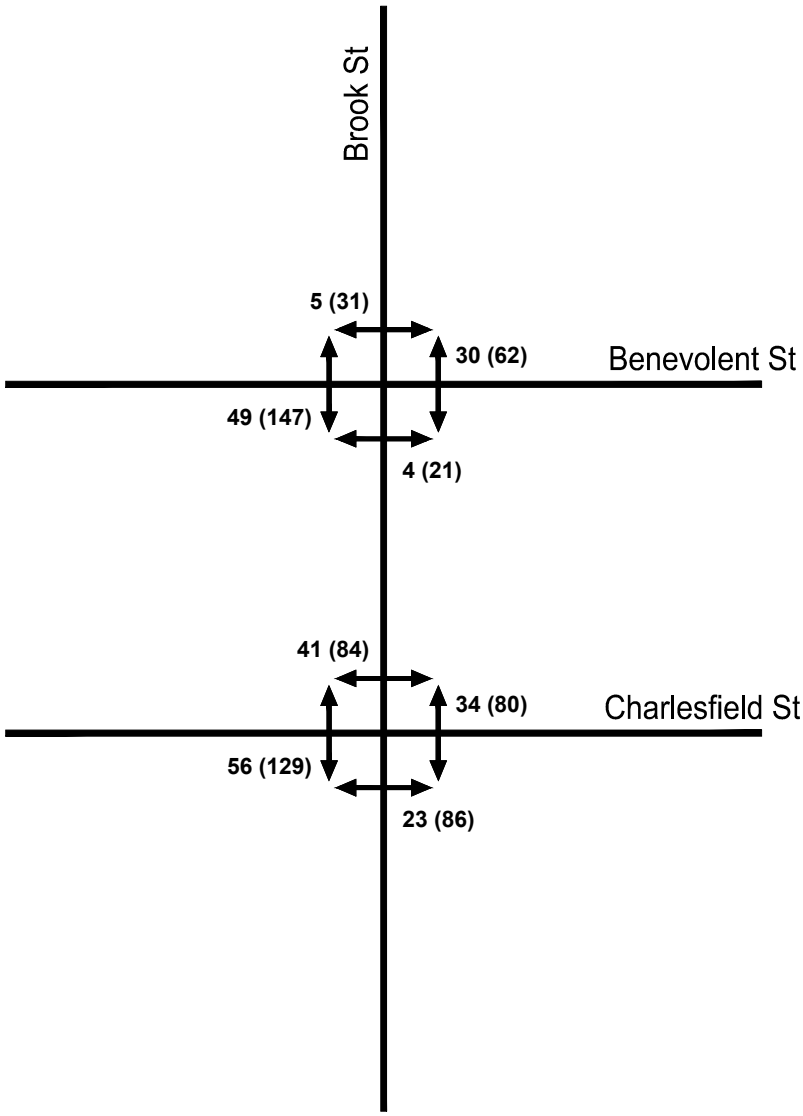


Not to Scale

2026 Existing Morning and Afternoon Peak Hour Traffic Volumes
Economics Project
Brown University
Providence, Rhode Island

Figure 2

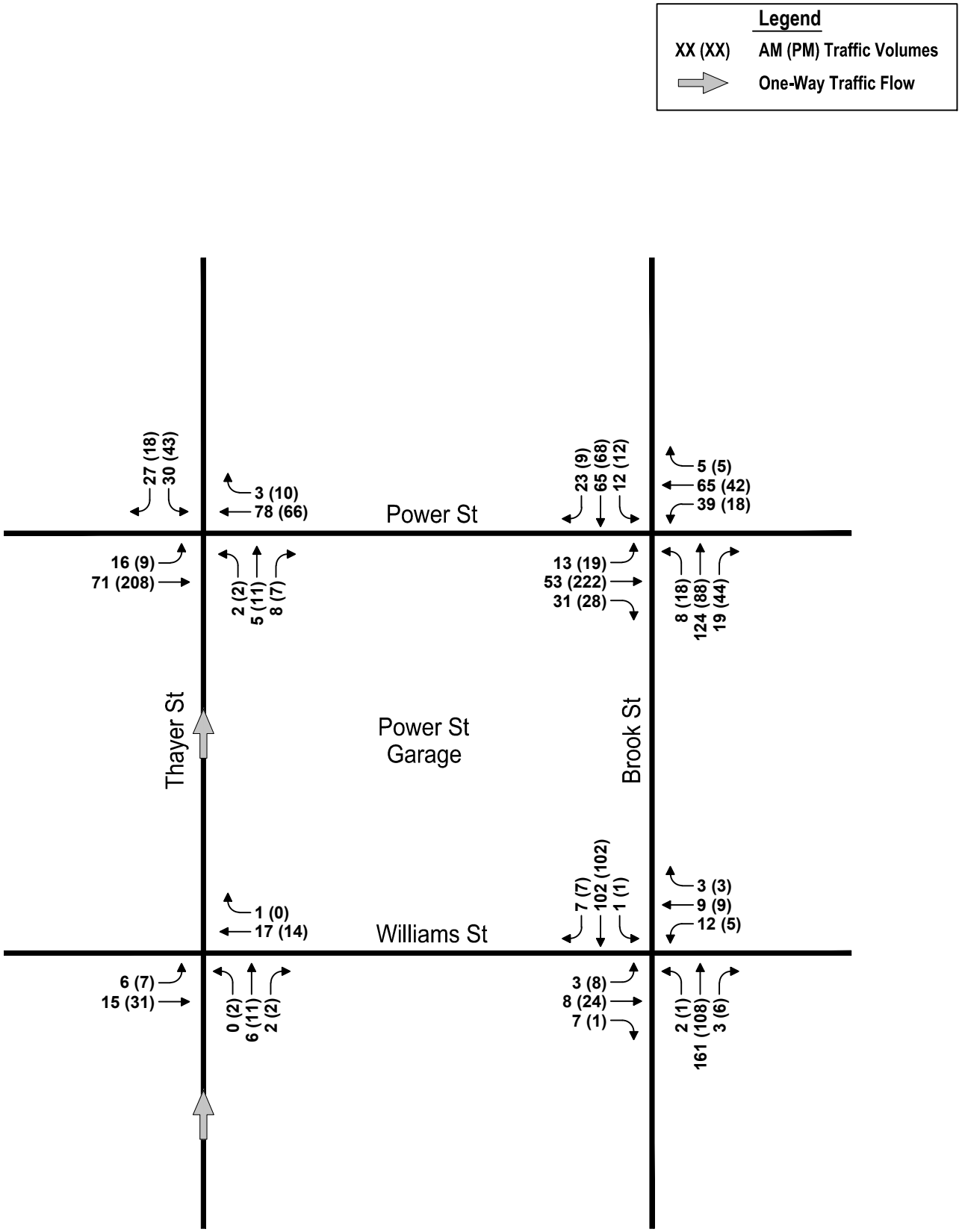
Legend	
XX (XX)	AM (PM) Pedestrian Volumes



Not to Scale

2026 Existing Morning and Afternoon Peak Hour Pedestrian Volumes
Economics Project
Brown University
Providence, Rhode Island

Figure 3



Not to Scale

2026 Existing Morning and Afternoon Peak Hour Traffic Volumes
Power Street Garage
Brown University
Providence, Rhode Island

Figure 4

Institutional Master Plan Stormwater Component Update
Brown University

Providence, Rhode Island

PREPARED FOR

Brown University
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Providence, RI

PREPARED BY

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OCTOBER 7, 2026

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Institutional Master Plan Stormwater Component Update

As part of Brown University's 2026 Institutional Master Plan (IMP) Update submission to the City of Providence, Brown University retained VHB to provide civil engineering services to update the Stormwater Master Plan (SMP), which comprises a portion of the overall IMP.

The 2026 SMP update documents stormwater management improvements that have been completed or are in the process of being implemented since the previous 2023 SMP update. In addition, the update incorporates two planned campus development projects: the proposed Economics Building and the Central Hub project.

New Stormwater Management Improvements

Since the 2023 SMP update, Brown University has implemented a variety of stormwater control and Best Management Practices (BMPs) to reduce stormwater discharges to the Narragansett Bay Commission (NBC) owned combined sewer system (CSS) and to provide improved stormwater quality. Brown University has undertaken six projects that included stormwater management improvements.

Danoff Laboratory

The construction of Danoff Laboratory, a 60,000 square foot life science building on Richmond Street is ongoing and is anticipated to be completed in 2027.

A primary goal for this project was to eliminate as much stormwater as possible from the CSS and to redirect runoff to the dedicated storm drain line in Ship Street while not surcharging the drain line. The project will incorporate a variety of stormwater management practices including:

- Bioretention areas
- Proprietary water quality unit (Contech Jellyfish)
- Underground infiltration/detention systems

Marston Boathouse

Construction at the Marston Boathouse was completed in 2025 and included a range of exterior site improvements to enhance overall site functionality, accessibility, and user

experience. Upgrades included pavement, driveway, and parking improvements in addition to other site features to support more efficient use of the facility.

As part of the project, stormwater quality improvements were incorporated into the site design to support water quality objectives and to align the site with Brown University's long-term sustainability objectives. Stormwater runoff from the Site discharges directly to the Seekonk River.

Stormwater BMPs implemented with this project include:

- Porous pavement
- Bioretention areas

Penner Fieldhouse

The new Penner Fieldhouse facility includes an indoor training facility with associated support spaces. This project also includes new bleachers and a press box at Goldberger Field, along with upgraded landscaping and pedestrian walkways surrounding the facility. Site improvements reduced impervious surface areas by about 5,000 square feet as part of the overall redevelopment.

Stormwater runoff from the site is collected and conveyed to an existing underground detention system located between the Berylson Family Fields and the Terrence Murray Baseball Stadium, which ultimately discharges to the municipal separate storm system (MS4) located in Arlington Ave. Peak discharge rates were slightly reduced as a result of the reduced impervious area.

Stormwater BMPs implemented with this project include:

- Proprietary water quality units (2 Contech Jellyfish units)

Andrews House

The Andrews House renovation included improvements to the building, surrounding site, and landscape features. Site enhancements included replacing the former rear parking area with landscaped areas and pedestrian walkways and installing associated stormwater enhancements.

The project incorporated stormwater management improvements, including reduced impervious surface area and installation of infiltrating drywells, resulting in reduced peak flow rates and reduced stormwater discharge volumes to the NBC-owned CSS.

Fleet Vehicle Parking at 295 Lloyd Avenue

An existing grass field was converted to a new parking lot with EV charging stations and walkways to be utilized by Brown University's Facilities Management and to serve as overflow parking for sporting events. Landscaping berms and plantings were provided as part of the project to mitigate noise and visual disturbances to abutting properties.

Structural stormwater BMPs were installed to provide stormwater quality and quantity mitigation for the increased impervious areas. Stormwater management practices implemented with this project include:

- Above ground detention pond
- Subsurface sand filter
- Detention pipe

Simmons Quadrangle

The project included construction of an outdoor amphitheater and ADA accessibility upgrades with associated stormwater and utility improvements. Completed in 2025, a goal of the project was to divert stormwater discharges from the CSS to the dedicated storm drain in Thayer Street. Stormwater management practices implemented to mitigate impacts to the separate storm system include:

- Underground detention system
- Sand filter

Summary conclusion of constructed projects

As a result of these constructed projects, there has been a net benefit with improvements water quality, reduction in volume of stormwater discharges to CSS, and generally a reduced rate of stormwater runoff for events up to and including the 100-year storm.

Planned Development Projects

Brown University is planning two new development projects which will be incorporated into the IMP, specifically a new Economics Building and the Central Hub. The new developments will adhere to stormwater management practices that align with the University's SMP objectives and satisfy local and state regulatory requirements.

Economics Building

The new economics building is planned to be located at the intersection of Charlesfield Street and Brook Street. Construction for this project is anticipated to begin in the summer of 2027. The planned site for the Economics Building contains existing impervious surfaces that drain to both the NBC owned CSS in Charlesfield Street and Brook Street as well as the dedicated storm drain in Brook Street. The Site is part of the Providence River Watershed which ultimately discharges to the Providence River. The Providence River is listed on the RIDEM 404d list of impaired water bodies with impairments for fecal coliform, total nitrogen, and dissolved oxygen. Nitrogen impairment is a pollutant of concern and will require targeted treatment practice.

This site improvements will result in a small increase in impervious areas, requiring mitigation and treatment. The project will need to provide water quality treatment through

the use of BMPs and Low Impact Development (LID) techniques. Treatment practices will need to target nitrogen removal. The project will utilize underground storage facilities to manage and mitigate peak flow rates to the dedicated storm drain in Brook Street, which is considered to have limited capacity. Stormwater management practices will need to meet the requirements for Stormwater Management, Design, and Installation Rules (250-RICR-150-10-8). Permits will likely be required from RI DEM, the Providence DPW, and NBC.

Central Hub

The Central Sustainable Thermal Energy Plant is planned as an addition to the north side of Page-Robinson Hall along Angell Street in the northwest portion of the College Hill campus. The Site is part of the Providence River Watershed which ultimately discharges to the Providence River. The Providence River is listed on the RIDEM 404d list of impaired water bodies with impairments for fecal coliform, total nitrogen, and dissolved oxygen. Nitrogen impairment is a pollutant of concern and will require targeted treatment practice.

The existing site contains impervious surfaces that drain primarily toward the CSS system in Waterman Street while some of the northern paved area and building roof discharge to the dedicated storm drainage system in Angell Street. There are drainage pipe connections to the storm drain in Angell Street from the northern portion of Page-Robinson Hall as well as the driveway and stairwell areaway on the east side of Page-Robinson Hall. The majority of the stormwater collected in parking Lot 17 is conveyed toward the “Walk” prior to discharge to the 12-inch clay CSS in Waterman Street.

A reduction in impervious area is anticipated as part of the development, which will reduce peak discharge rates and volumes to the CSS and dedicated storm drain systems. The stormwater management system for the Central Hub is anticipated to incorporate Low Impact Development (LID) site planning and design strategies which may include green roofs, rain gardens, sand filters, pervious pavers, and pervious pavement to address water quality requirements, and required volume reductions to the CSS. The LID systems and/or alternative proprietary treatment systems must be designed to treat the first inch of stormwater runoff produced by the site's impervious surfaces.

Table 1 Existing Best Management Practices (BMPs)

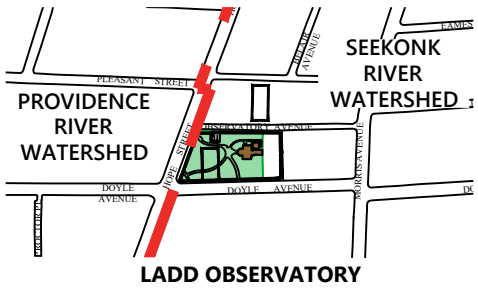
Designation	Location	BMP	Year Constructed	Receiving System
A	Benevolent St. Parking Lot #65	Underground Infiltration 1	Before 2000	Combined Sewer
B	Benevolent St. Parking Lot #65	Underground Infiltration 2	Before 2000	Combined Sewer
~~C~~	~~Charlesfield St. Parking Lot #64~~	~~Underground Infiltration~~	~~Before 2000~~	~~Combined Sewer~~
D	Starr Plaza at Watson Institute	Drywell 1	2001	Combined Sewer
E	Starr Plaza at Watson Institute	Drywell 2	2001	Combined Sewer
F	Starr Plaza at Watson Institute	Drywell 3	2001	Combined Sewer
G	Starr Plaza at Watson Institute	Green Roof	2001	Combined Sewer
H	Starr Plaza at Watson Institute	Underground Infiltration 1	2001	Combined Sewer
~~I~~	~~Starr Plaza at Watson Institute~~	~~Underground Infiltration 2~~	~~2001~~	~~Combined Sewer~~
J	Starr Plaza at Watson Institute	Underground Infiltration 3	2001	Combined Sewer
K	Starr Plaza at Watson Institute	Underground Infiltration 4	2001	Combined Sewer
L	Sidney Frank Hall 185 Meeting Street	Water Reuse	2005	Providence River
M	Sciences Library 201 Thayer St.	Green Roof	2007	Providence River
N	Granoff Creative Arts Center 154 Angell Street	Green Roof	2010	Providence River
O	Granoff Creative Arts Center 154 Angell Street	Rain Garden (Infiltration)	2010	Providence River
P	Alpert Medical School 222 Richmond St.	Redirect Stormwater from CS to Separate Storm	2010	Providence River
Q	Alpert Medical School 222 Richmond St.	Green Roof	2012	Providence River
1	85 Waterman St.	Greening	2014	Providence River
2	85 Waterman St.	Water Reuse	2014	Providence River
~~3~~	~~450 BrookSt. Parking Lot~~	~~Sand Filter 1(with 2 Sediment Forebaysand Grass Swale)~~	~~2016~~	~~Providence River~~
4	~~450 BrookSt. Parking Lot~~	~~Sand Filter 2(with Sediment Forebay)~~	~~2016~~	~~Providence River~~
5	School of Engineering 345 Brook St.	Rain Garden(with Grass Swale)	2016	Providence River
6	School of Engineering 345 Brook St.	Sand Filter	2016	Providence River
7	Ittleson Quad	Greening	2012	Seekonk River
~~8~~	~~Tockwotten~~	~~Greening~~	~~2013~~	~~Combined Sewer~~

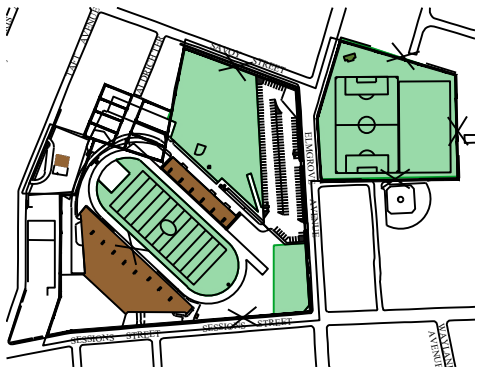
Designation	Location	BMP	Year Constructed	Receiving System
9	Watson Institute	Underground Infiltration,Jellyfish Filter, Stormceptor Unit	2017	N/A - Groundwater
10	Performing Arts Center 130-132 Angell St	Jellyfish Filter, Underground Detention	2021	Providence River
11	450 Brook St. Wellness Center	Jellyfish Filter	2021	Providence River
12	Brook St. Housing	Enhanced Biofiltration	2022	Providence River
13	Applied Math 170 Hope Street	Sand Filter, Rain Garden (2)	2015	Providence River
14	Lacrosse & Soccer 235 Hope Street	Sand Filter Trench	2020	Seekonk River
15	Nelson Fitness Center	Hydrodynamic Separator	2012	Providence River
16	Marston Boathouse	Pervious Pavement, Bioretention Area (2)	2025	Seekonk River
17	Penner Fieldhouse (Indoor Turf Facility)	Jellyfish Filter	2026	Seekonk River
18	Integrated Life Sciences Building (Danoff Labs)	Underground Infiltration, Bioretention Areas (5), Jellyfish Filter	2027	Providence River
19	Andrews House	Drywells	2024	Providence River
20	295 Lloyd Avenue	Sand Filter, Detention	2024	Seekonk River
21	Simmons Quadrangle	Underground Detention, Sand Filter	2025	Providence River

Appendix B

DESIGNATION	LOCATION	BMP
A	BENEVOLENT ST. PARKING LOT #65	UNDERGROUND INFILTRATION 1
B	BENEVOLENT ST. PARKING LOT #65	UNDERGROUND INFILTRATION 2
D	STARR PLAZA AT WATSON INSTITUTE	DRYWELL 1
E	STARR PLAZA AT WATSON INSTITUTE	DRYWELL 2
F	STARR PLAZA AT WATSON INSTITUTE	DRYWELL 3
G	STARR PLAZA AT WATSON INSTITUTE	GREEN ROOF
H	STARR PLAZA AT WATSON INSTITUTE	UNDERGROUND INFILTRATION 1
J	STARR PLAZA AT WATSON INSTITUTE	UNDERGROUND INFILTRATION 3
K	STARR PLAZA AT WATSON INSTITUTE	UNDERGROUND INFILTRATION 4
L	185 MEETING ST. SIDNEY FRANK HALL	WATER REUSE
M	201 THAYER ST. SCIENCES LIBRARY	GREEN ROOF
N	154 ANGELL ST. GRANOFF CREATIVE ARTS CENTER	GREEN ROOF
O	154 ANGELL ST. GRANOFF CREATIVE ARTS CENTER	RAIN GARDEN (INFILTRATION)
P	222 RICHMOND ST. ALPERT MEDICAL SCHOOL	REDIRECT STORMWATER FROM CS TO SEPERATE STORM
Q	222 RICHMOND ST. ALPERT MEDICAL SCHOOL	GREEN ROOF
1	85 WATERMAN ST.	GREENING
2	85 WATERMAN ST.	WATER REUSE
5	345 BROOK ST. SCHOOL OF ENGINEERING	RAIN GARDEN WITH GRASS SWALE
6	345 BROOK ST. SCHOOL OF ENGINEERING	SAND FILTER
7	ITTLESON QUAD	GREENING
9	WATSON INSTITUTE	UNDERGROUND INFILITRATION, JELLYFISH FILTER, STORMCEPTOR UNIT

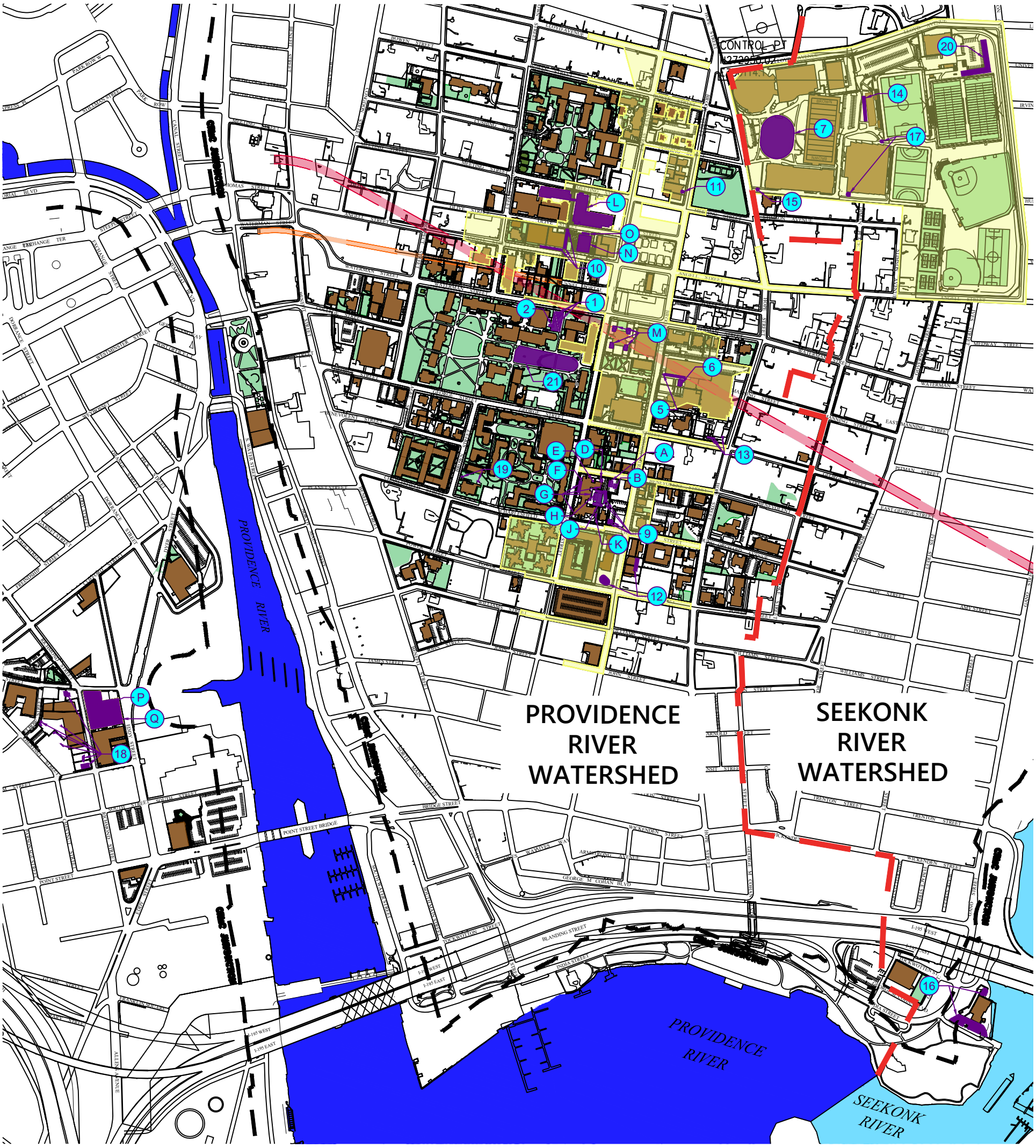
DESIGNATION	LOCATION	BMP
10	130-132 ANGELL ST. PERFORMING ARTS CENTER	JELLYFISH FILTER, UNDERGROUND DETENTION
11	450 BROOK ST. WELLNESS CENTER	JELLYFISH FILTER
12	BROOK ST. HOUSING	ENHANCED BIOFILTRATION
13	170 HOPE ST. APPLIED MATCH	SAND FILTER, RAIN GARDEN (2)
14	235 HOPE ST. LACROSSE & SOCCER	SAND FILTER TRENCH
15	NELSON FITNESS CENTER	HYDRODYNAMIC SEPARATOR
16	MARSTON BOATHOUSE	PERVIOUS PAVEMENT, BIORETENTION AREA (2)
17	PENNER FIELDHOUSE (INDOOR TURF FACILITY)	JELLYFISH FILTER
18	INTEGRATED LIFE SCIENCES BUILDING (DANOFF LABS)	UNDERGROUND INFILTRATION, BIORETENTION AREA (5). JELLYFISH FILTER
19	ANDREWS HOUSE	DRYWELL (3)
20	295 LLOYD AVE	SAND FILTER, DETENTION
21	SIMMONS QUAD	UNDERGROUND DETENTION, SAND FILTER





LEGEND:

- WATERSHED BOUNDARY
- SEPARATE STORMWATER
- BROWN UNIVERSITY BUILDINGS
- BROWN UNIVERSITY GREEN SPACE
- 200' CRMC JURISDICTION
- BUS TUNNEL
- RAILROAD TUNNEL
- BROWN OWNED PARCEL LIMITS
- EXISTING BMPS



0 300 600 Feet

Existing BMPs

Brown University
Providence, RI

Figure 1

September 2026

Table 2A: Stormwater Treatment Summary – Providence River Watershed

Designation	Location	BMP	Year Constructed	Disturbed [1] Impervious Area (ac)	New [2] Impervious Area (ac)	Redirected [3] Impervious Area (ac)	Required Treatment Area (ac)	Area Treated (ac)	Treatment Credit (ac)
1	85 Waterman St.	Greening	2014	0.26	0	N/A	0.13	0.13	0.00
2		Water Reuse		0.24	0	N/A	0.12	0.24	+0.12
~~3~~	~~450 Brook St. Parking Lot~~	~~Sand Filter 1(with 2 Sediment Forebays and Grass Swale)~~	~~2016~~	~~0.46~~	~~0.06~~	~~N/A~~	~~0.30~~	~~0.32~~	~~+0.02~~
4		~~Sand Filter 2(with Sediment Forebay)~~				~~N/A~~			
5	School of Engineering 345 Brook St.	Rain Garden (with Grass Swale)	2016	0.46	0.16	N/A	0.39	0.53	+0.13
6		Sand Filter				N/A			
10	Performing Arts Center 130-132 Angell St	Jellyfish Filter, Underground Detention	2021	0.18	0.54	0.47	0.98	0.74	-0.24
11	450 Brook St. Wellness Center	Jellyfish Filter	2021	0.52	0.17	N/A	0.42	0.58	+0.16
12	Brook St. Housing	Enhanced Biofiltration	2022	0.98	0.33	0.16	0.94	0.92	-0.02
18	Integrated Life Sciences Building (Danoff Labs)	Underground Infiltration, Bioretention Area (5), Jellyfish Filter	2027	0.00	0.00	1.50	1.12	0.67	-0.45
21	Simmons Quadrangle	Underground Detention, Sand Filter	2025	1.1	1.2	1.10	0.6	0.71	+0.11
								TOTAL	-0.19

Notes:

1 Disturbed Impervious Area requires 50% treatment

2 New Impervious Area requires 100% treatment

3 Redirected Impervious Area from combined sewer to separate storm requires 75% treatment

The sand filters listed as Designation 3 and 4 were replaced by the Wellness Center jellyfish filter, Designation 11. Therefore, their credit has been removed. Tockwotten (Designation 8) has been removed from the tables, as it is no longer a Brown University owned parcel.

Table 2B: Stormwater Treatment Summary – Seekonk River Watershed

Designation	Location	BMP	Year Constructed	Disturbed [1] Impervious Area (ac)	New [2] Impervious Area (ac)	Redirected [3] Impervious Area (ac)	Required Treatment Area (ac)	Area Treated (ac)	Treatment Credit (ac)
7	Ittleson Quad	Greening	2012	0	0		0	1.98	+1.98
16	Marston Boathouse	Pervious Pavement, Bioretention Area (2)	2025	0.69	0.55		0.3	0.36	+0.06
17	Penner Fieldhouse (Indoor Turf Facility)	Jellyfish Filter	2026	2.76	2.56		1.2	1.51	+0.31
20	295 Lloyd Ave	Sand Filter, Detention	2024	0.50	0.90		0.56	0.62	+0.06

Notes:
1 Disturbed Impervious Area requires 50% treatment
2 New Impervious Area requires 100% treatment
3 Redirected Impervious Area from combined sewer to separate storm requires 75% treatment
The sand filters listed as Designation 3 and 4 were replaced by the Wellness Center jellyfish filter, Designation 11. Therefore, their credit has been removed. Tockwotten (Designation 8) has been removed from the tables, as it is no longer a Brown University owned parcel.

Table 3A: Nitrogen Removal Summary – Providence River Watershed

Designation	Location	BMP	Year Constructed	Nitrogen Loading (lbs/yr)			
				Pre	Post	Δ	% Removed
1	85 Waterman St.	Greening	2014	7.27	5.00	-2.27	31%
2		Water Reuse		4.58	0.00	-4.58	100%
~~3~~	~~450 Brook St. Parking Lot~~	~~Sand Filter 1(with 2 Sediment Forebays and Grass Swale)~~	~~2016~~	~~9.09~~	~~6.94~~	~~-2.15~~	~~24%~~
~~4~~		~~Sand Filter 2 (with Sediment Forebay)~~					
5	School of Engineering 345 Brook St.	Rain Garden(with Grass Swale)	2016	15.63	15.54	-0.09	0.6%
6		Sand Filter					
10	Performing Arts Center 130-132 Angell St	Jellyfish Filter, Underground Detention	2021	11.19	18.27	+7.08	-63%
11	450 Brook St. Wellness Center	Jellyfish Filter	2021	9.09	6.57	-2.52	27%
12	Brook St. Housing	Enhanced Biofiltration (2)	2022	22.27	21.21	-1.07	4%
					Total Nitrogen Removed (lbs/yr):	3.45	

Note:
The sand filters listed as Designation 3 and 4 were replaced by the Wellness Center jellyfish filter, Designation 11. Therefore, their credit has been removed.

Table 3B: Nitrogen Removal Summary – Seekonk River Watershed

Designation	Location	BMP	Year Constructed	Nitrogen Loading (lbs/yr)			
				Pre	Post	Δ	% Removed
7	Ittleson Quad	Greening	2012	173.27	137.39	-35.88	21%
20	295 Lloyd Ave	Sand Filter, Detention	2024	10	7.5	-2.5	25%
					Total Nitrogen Removed (lbs/yr):	38.4	

Table 4A.C: Stormwater Diverted from the Combined Sewer: NBC Sewer Basin C – Volume Summary

Designation	Location	BMP	Year Constructed	Runoff Volume (ac-ft)														
				3-month[1]			2-year			10-year			50-year			100-year		
				Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
9	Watson Institute	Underground Infiltration	2017	0.01	0.00	-0.01	0.02	0.00	-0.02	0.03	0.00	-0.03	0.06	0.00	-0.06	0.07	0.00	-0.07
10	Performing Arts Center	Jellyfish Filter, Underground Detention	2021	0.06	0.00	-0.06	0.12	0.00	-0.12	0.18	0.00	-0.18	0.27	0.21	-0.06	0.33	0.26	-0.07
11	Brook Street Housing	Enhanced Biofiltration with ISR (2)	2022	0.02	0.00	-0.02	0.04	0.00	-0.04	0.06	0.00	-0.06	0.09	0.00	-0.09	0.11	0.00	-0.11
21	Simmons Quadrangle	Underground Detention, Sand Filter	2025	0.09	0.01	-0.08	0.26	0.02	-0.24	0.46	0.03	-0.43	0.79	0.07	-0.72	0.99	0.16	-0.83
Total Stormwater Volume Removed (ac-ft):				0.17			0.42			0.7			0.93			1.08		
Total Stormwater Volume Removed (gallons):				55,400			136,860			228,100			303,040			351,920		

Notes:
April 2023 revision: NBC 3 month rain event added to tracking tables.
April 2023 revision: New projects to be added and tracked in table per correct NBC sewer basin.

Table 4A.E: Stormwater Diverted from the Combined Sewer: NBC Sewer Basin E – Volume Summary

Designation	Location	BMP	Year Constructed	Runoff Volume (ac-ft)														
				3-month[1]			2-year			10-year			50-year			100-year		
				Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
18	Integrated Life Sciences Building (Danoff Labs)	Underground Infiltration, Bioretention Areas (5), Jellyfish Filter	2027	0.29	0.17	-0.12	0.66	0.47	-0.19	1.00	0.78	-0.22	-	-	-	1.82	1.57	-0.25
Total Stormwater Volume Removed (ac-ft):				0.12			0.19			0.22			-			0.25		
Total Stormwater Volume Removed (gallons):				39,100			61,910			71,690			-			81,460		

Notes:
April 2023 revision: NBC 3 month rain event added to tracking tables.
April 2023 revision: New projects to be added and tracked in table per correct NBC sewer basin.

Table 4B.C: Stormwater Diverted from the Combined Sewer: NBC Sewer Basin C – Peak Flow Summary

				Peak Flow																	
				3-month[1]				2-year				10-year				50-year				100-year			
Designation	Location	BMP	Year Constructed	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)
9	Watson Institute	Underground Infiltration	2017	0.04	0.00	- 0.04	-18	0.27	0.00	-0.27	-121	0.46	0.00	-0.46	-206	0.75	0.00	-0.75	-336	0.92	0.00	-0.92	-412
10	Performing Arts Center	Jellyfish Filter, Underground Detention	2021	0.29	0.00	- 0.29	-130	0.91	0.00	-0.91	-408	1.42	0.00	-1.42	-637	2.18	1.5	-0.68	-305	2.62	1.81	-0.81	-364
11	Brook Street Housing	Enhanced Biofiltration with ISR (2)	2022	0.09	0.00	- 0.09	-40	0.51	0.00	-0.51	-228	0.76	0.00	-0.76	-341	1.13	0.00	-1.13	-507	1.35	0.00	-1.35	-605
21	Simmons Quadrangle	Underground Detention, Sand Filter	2025	1.33	0.11	- 1.22	-550	3.14	0.24	-2.90	-1300	5.69	0.42	-5.27	- 2370	9.81	1.61	-8.20	- 3680	12.26	4.19	-8.07	-3620
Total Stormwater Peak Flow Diverted				-1.64		738		4.59		2057		7.91		3554		10.76		4828		11.15		5001	

Notes:
April 2023 revision: NBC 3 Month rain event added to tracking tables.
April 2023 revision: New projects to be added and tracked in table per correct NBC sewer basin.

Table 4B.E: Stormwater Diverted from the Combined Sewer: NBC Sewer Basin E – Peak Flow Summary

Designation	Location	BMP	Year Constructed	Peak Flow																	
				3-month[1]				2-year				10-year				50-year				100-year			
				Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)	Pre (cfs)	Post (cfs)	Δ (cfs)	Δ (gpm)
18	Integrated Life Sciences Building (Danoff Labs)	Underground Infiltration, Bioretention Areas (5), Jellyfish Filter	2027	5.27	0.78	-4.49	2020	8.05	2.05	6.00	2690	12.08	3.22	8.86	3980	-	-	-	-	21.65	5.12	16.53	7420
Total Stormwater Peak Flow Diverted				4.49			2020	6.00			2690	3.22			3980	-			-	16.53			7420

Notes:
April 2023 revision: NBC 3 Month rain event added to tracking tables.
April 2023 revision: New projects to be added and tracked in table per correct NBC sewer basin.

Table 5: Potential Stormwater Project Locations

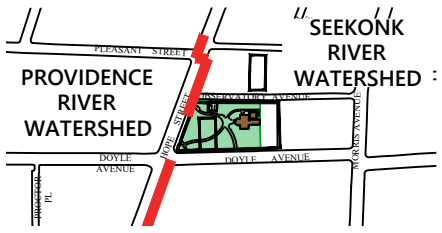
Designation	Address (Location)	Existing Surface	Receiving System	Potential BMP Type
12	84 Prospect Street (Northwest of Rochambeau House)	Parking Lot	Combined Sewer	A, D
13	87 Prospect Street (South of Machado House)	Green Space	Combined Sewer	A
14	131-133 Brown Street (East of Building)	Parking Lot	Combined Sewer/ Providence River	A, B, C, D, E
15	211 Bowen Street (West of Andrews Common)	Green Space	Combined Sewer/ Providence River	A, B, E
16	211 Bowen Street (West of Metcalf Hall)	Parking Lot	Providence River	A, C, D, E
17	187 Cushing Street (New Pembroke)	Parking Lot	Providence River	A, C, D, E
18	Ittleson Quad	Green Space	Seekonk River	A, E
19	194 Meeting Street (South of Alumnae Hall)	Green Space	Providence River	A, E
~~20~~	~~79 Brown Street (North of Peter Green House)~~	~~Green Space~~	~~Providence River~~	~~A, E~~
21	21 Prospect Street (West of Manning Hall)	Green Space	Combined Sewer/ Providence River	A, E
22	21 Prospect Street (East of Manning Hall)	Green Space	Combined Sewer/ Providence River	A, E
23	Simmons Quadrangle (South of Lyman Hall)	Green Space	Providence River	A, E
24	Sciences Park & RI Granite (West and South of Marston Hall)	Green Space	Providence River	A, E
25	150 Hope Street (West of Fox Point Day Care Center)	Parking Lot	Providence River	A, B, C, D, E
26	1 Young Orchard Avenue (East of Orwig Music Hall)	Parking Lot	Combined Sewer/ Providence River	A, B, C, D, E
27	10 Young Orchard Avenue (West Parking Lot)	Parking Lot	Combined Sewer/ Providence River	A, B, C, D, E
28	2 Young Orchard Avenue (South Community Garden)	Green Space	Combined Sewer/ Providence River	A, B, E
29	103 Thayer Street (Vartan Gregorian Quad)	Green Space	Providence River	A, B, C, E
30	101 Power Street (West and East of Power Street Parking Garage)	Gravel Area	Providence River	B, E
~~31~~	~~383 Benefit Street (East of Hoppin House)~~	~~Parking Lot~~	~~Combined Sewer~~	~~A, E~~
32	64 College Street (West of List Art Building)	Green Space	Combined Sewer	A
33*	200 Meeting Street (South of Emery Hall)	Green Space	Providence River	A, E
34*	200 Meeting Street (East of Emery Hall)	Parking Lot	Providence River	A, C, D, E
35*	315 Thayer Street (Parking Lot)	Parking Lot	Providence River	A, C, D, E
36	Integrated Life Sciences Building	Buildings & Parking Lot	Combined Sewer	A, B, C, E
37	Athletics Field & Complex	Green Space	Seekonk River	A, B, C, E
38	Page Robinson Hall (Central Hub)	Buildings & Parking Lot	Combined Sewer/ Providence River	B, C, D, E
39	75 Charlesfield St/Lot 57 (Economics Building)	Buildings and Parking Lot	Combined Sewer/ Providence River	A, B, C, D, E

*Secondary Location Potential BMP Type Legend:
A – Subsurface Infiltration
B – Bioretention Basin / Rain Garden
C – Tree Box Filter
D – Porous Pavement
E – Subsurface Proprietary Structure

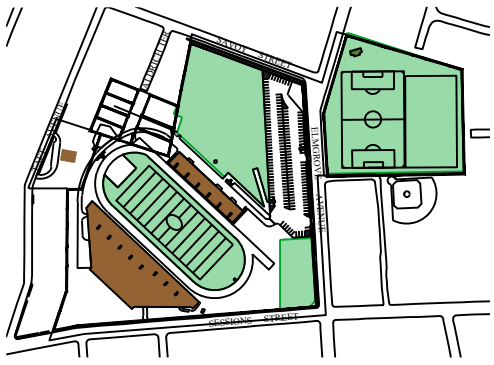
Appendix B

LEGEND:

- WATERSHED BOUNDARY
- SEPARATE STORMWATER
- BROWN UNIVERSITY BUILDINGS
- BROWN UNIVERSITY GREEN SPACE
- 200' CRMC JURISDICTION
- BUS TUNNEL
- RAILROAD TUNNEL
- BROWN OWNED PARCEL LIMITS
- EXISTING BMPS (L)
- PROPOSED BMPS (8)



LADD OBSERVATORY



BROWN STADIUM

