40 RUGG ROAD
BOSTON (ALLSTON), MA
PROJECT NOTIFICATION FORM

Submitted to:
Boston Planning and Development Agency

Submitted by:
The Michaels Organization

THE Michaels ORGANIZATION
Together We Build Communities

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1.0 PROJECT SUMMARY

1.1 Project Identification

Project Name: 40 Rugg Road Proposed Mixed-use Development

Address/Location: 28-32 & 40 Rugg Road, 76-78 Braintree Street, and 10-10R & 38-40 Penniman Road, Boston, MA 02134

Assessor's Parcel #s: 2201825000, 2201807000, 2201808000, 2201810010 and 2201821010.

1.2 Project Site

The Michaels Organization (the "Proponent") proposes to construct a new residential complex at 40 Rugg Road (the "Project"), on a 1.89-acre lot, comprised of five parcels (the "Site") located in the Allston/Brighton Neighborhood District. The Site is relatively flat and is currently improved with a surface parking lot containing 45 parking spaces, and four existing industrial buildings: a one-story brick building fronting on Penniman Road, a two-story brick building fronting on Rugg Road, a one and a half-story building fronting on Penniman and Rugg Road, and a one-story brick building adjacent to Braintree Street. The Site is bounded by Penniman Road to the West, Braintree Street to the North, Rugg Road to the East and existing industrial buildings to the South. See Figure 1-1, Locus Map. And Figures 1-2 through 1-5 for Aerial Views of the Existing Site and Existing Conditions Photographs.

Figure 1-1: Aerial Locus Map

Figure 1-2: Aerial Views of Existing Site

AERIAL VIEW OF SITE LOOKING SOUTH-WEST SOURCE: GOOGLE

AERIAL VIEW OF SITE LOOKING SOUTH-EAST SOURCE: GOOGLE

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Figure 1-3: Existing Conditions Photographs

VIEW LOOKING EAST FROM BRAINTREE STREET SOURCE: GOOGLE

VIEW LOOKING WEST FROM BRAINTREE STREET SOURCE: GOOGLE

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Figure 1-4: Existing Conditions Photographs

VIEW LOOKING SOUTH-WEST FROM RUGG ROAD SOURCE: GOOGLE

VIEW LOOKING SOUTH-WEST FROM PENNIMAN ROAD SOURCE: GOOGLE

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Figure 1-5: Existing Conditions Photographs

VIEW LOOKING NORTH-EAST FROM EMERY ROAD SOURCE: GOOGLE

VIEW LOOKING NORTH-EAST FROM PENNIMAN ROAD SOURCE: GOOGLE

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1.3 Project Summary

The Project will include two new 6-story buildings totaling approximately 248,088 square feet that will contain 261 rental apartment units, ground floor retail space, residential amenities and 46,350 square feet of automated valet parking structure. Although described separately, Building A and Building B are physically connected. Building A and B will be located in an "L"-shape configuration along the southern and eastern boundaries of the Site. Building C will be located in a "C"-shape configuration on the northern side of the site, wrapping around the parking structure. The combined footprint of the residential buildings will total approximately 43,100 square feet and the height of each building will be approximately 69-feet. The parking structure footprint will be 8,500 square feet and its height will be approximately 45 feet.

The new parking garage will contain approximately 168 parking spaces and be accessed from Penniman Road. In addition, 12 surface parking spaces will be provided on Emery Road and along the existing driveway accessed from Rugg Road. Loading and delivery will take place between building B and C, accessed through the existing driveway off of Rugg Road. Retail Loading will take place on Penniman Road. Trash and recycling pick-up accessed and residential move-in and move-out loading for Buildings A-B will be off Emery Road and for Building C will be off Penniman Road.

The space between Building A-B and the adjacent 20 and 30 Penniman buildings will be landscaped to provide an attractive open courtyard, which continues the existing green space across Penniman Road, the Penniman Road Playground. Plantings and other landscape features will enhance the overall character of the site, reducing the amount of paved surface and creating a softer, greener environment for residents and the public. See Figure 1-6 Site Plan.

Figure 1-6: Site Plan

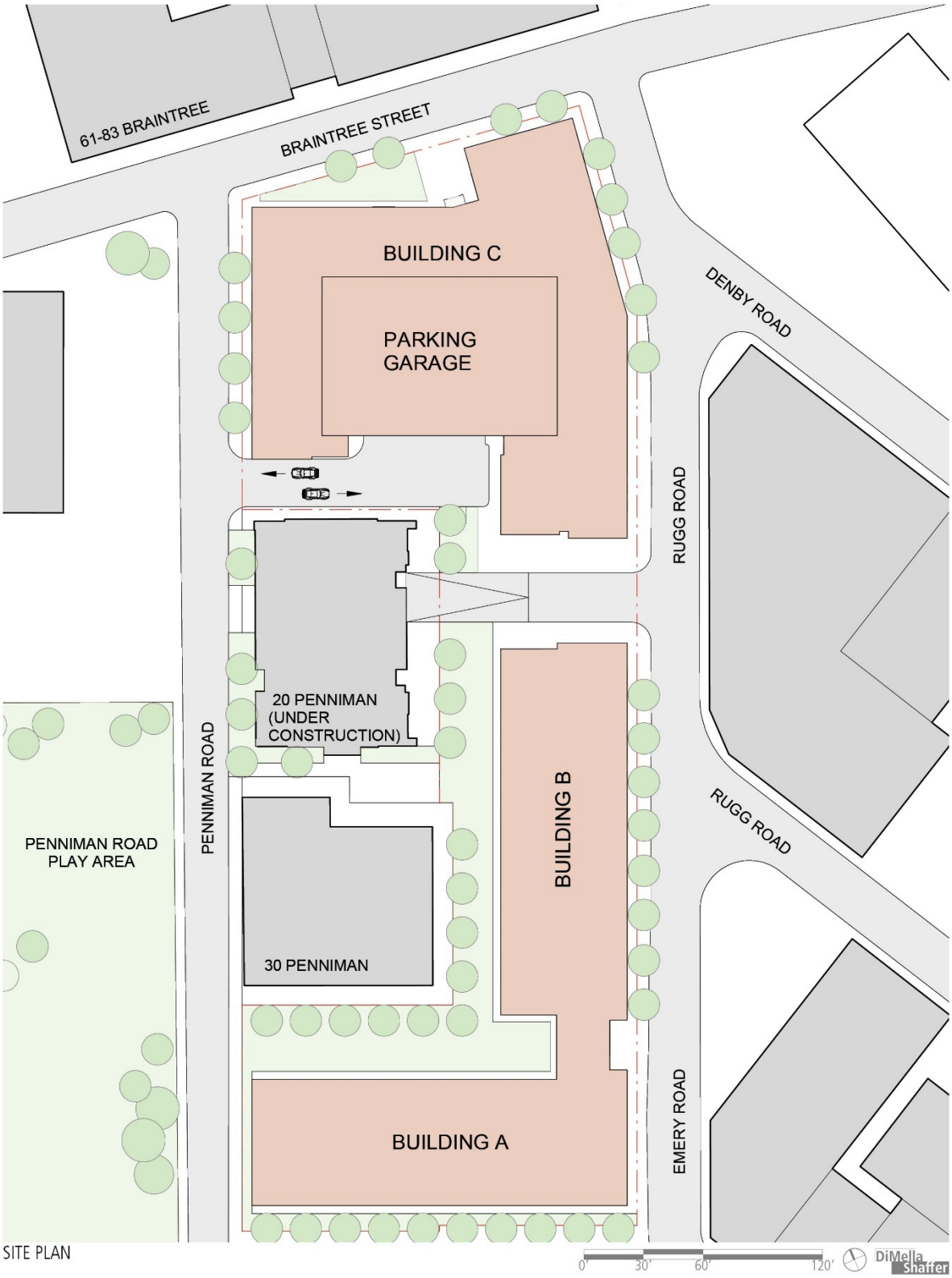
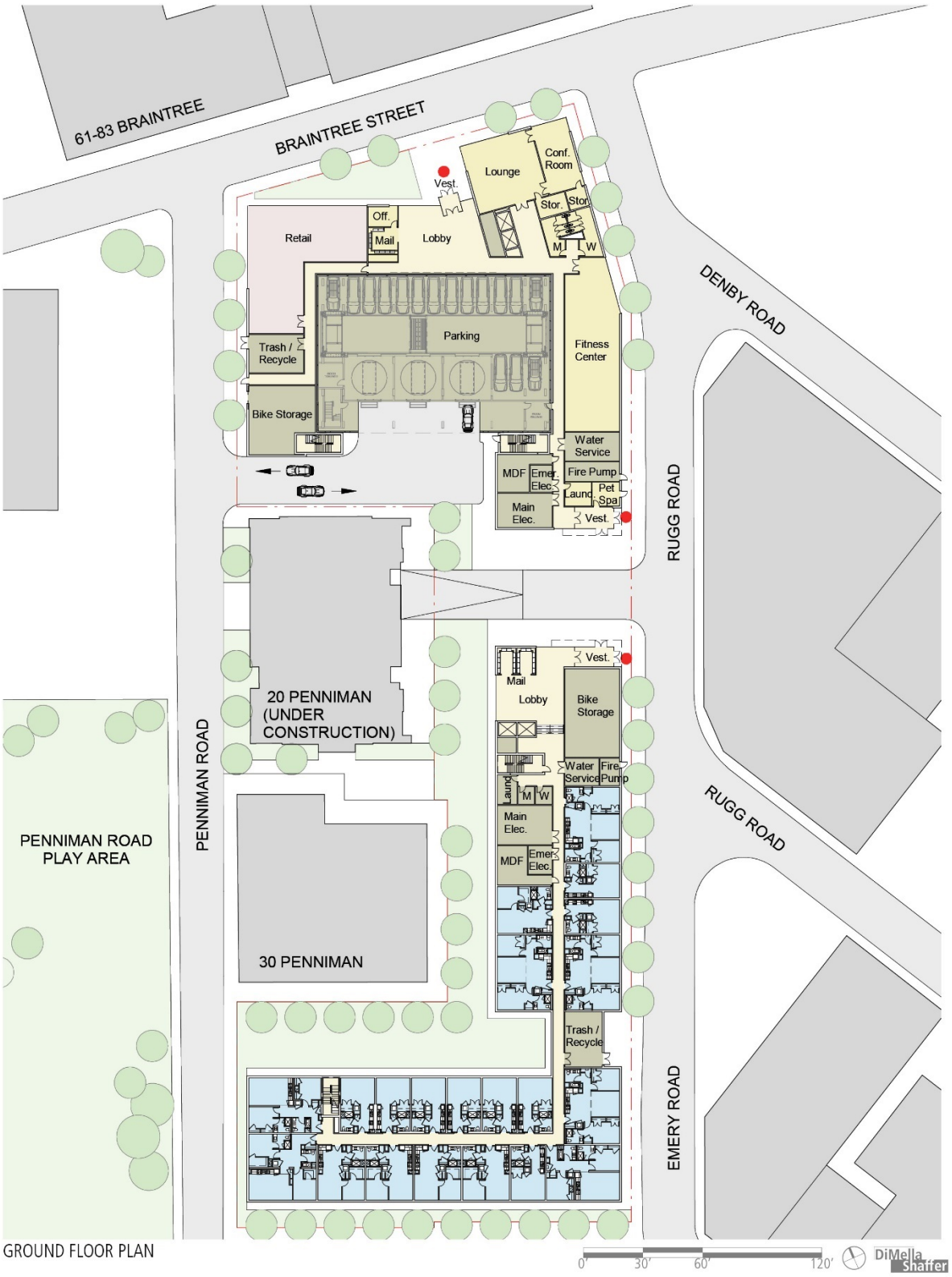


Figure 1-7: Ground Floor Plan



1.4 Community Process

The Project will exceed the 50,000 square feet of gross floor area which is the threshold for developments being subject to Large Project Review under Article 80 of the Boston Zoning Code (the "Code"). As such, this Project Notification Form is being submitted to engage the Boston Planning and Development Agency process.

Subsequent to PNF submission, a scoping session and a community meeting will occur prior to the issuance of a Scoping Determination. The project will also be assigned an Impact Advisory Group (IAG). The IAG is comprised of members of the community who have a vested interest in their neighborhood to provide input on local developments. The Proponent is committed to working closely with the IAG to ensure the project meets the expectations of the surrounding community.

1.5 Community and Public Benefits

The Project will transform an underutilized site into a mixed-use development that will provide numerous community and public benefits. These benefits include the creation of much-need housing and affordable housing units, job creation, improved pedestrian amenities, expanded retail or restaurant options, and additional tax revenue to the City of Boston by increasing the assessed value of the Property.

The Project is expected to bring over 285 residents, whose spending power and economic contribution is expected to support 89 jobs, as well as 234 direct construction and 14 permanent jobs to the Project and within the vicinity of the station and will create corresponding economic development in and around the Boston Landing MBTA Station. Further, the Project is expected to generate an additional 446 transit trips on the Framingham/Worcester Commuter Line, generating an additional $732,550 per year (for trips from Boston Landing to South Station) for the MBTA. This same trip would afford the new residents efficient commutes downtown consistently of only two stops and about a 15-minute ride.

The Project is to be located immediately adjacent, 0.2 miles and less than a 5 minute walk, to the Boston Landing MBTA station, leveraging and enhancing the use of public transportation in the City and the surrounding region to offer direct, economical and environmentally friendly access to the site for tenants, businesses, customers, employees, individuals, and others.

By transforming an underutilized site into a vibrant mixed-use residential and retail location, the Project will contribute substantially to the improvement of the pedestrian environment, the retail and service vitality of the neighborhood, and the urban design and architectural character of the Brighton/Braintree Street area. Specific public benefits include:

1.5.1 *New Market Rate and Affordable Housing Units*

The Project will provide 261 units of much-needed housing and will satisfy the City's Inclusionary Development Policy ("IDP") by designating 13% of the total units as affordable (34 affordable housing units). The affordable housing units will be reserved for low income families in accordance with IDP regulations. The unit sizes and unit mix will be consistent with BPDA Policy of Affordable Housing.

1.5.2 *Job Creation*

As a part of the construction process, the proposed project will provide 234 construction jobs and an additional 4 full time jobs. The proponent is committed to adhering to the Boston Residency Jobs Policy which outlines the minimum number of minorities, women and residents working on the project at any given time. There will be a designated area on the construction site for the posting of job applications so that all local and Boston residents can be aware and apply for any potential employment opportunities. The proponent will work closely with local community leaders to ensure that the project fosters opportunities for employment.

1.5.3 *Improved Pedestrian Amenities*

The Project design team will work closely with the Boston Transportation Department (BTD) and is committed to complying with the Complete Streets Initiative to provide improved pedestrian access around the project site. These improvements will provide ADA/AAB compliant routes, street landscaping and improved pedestrian safety. Public way improvements will adhere to City of Boston standards and the Brighton Street Area Planning Study. The Planning Study envisions Braintree Street as a live/work street with a narrow right of way. The proposed design is consistent with The Planning Study vision with retail and amenity spaces proposed on the ground floor and residential above along Braintree Street. In addition, the proposed buildings along Braintree Street will be setback from the existing sidewalk limits and right of way in order to enhance the walkability and increase the public realm experience as outlined by the Planning Study. Under the Planning Study, the remaining streets surrounding the Project

are considered neighborhood streets. The proposed streetscapes for Rugg Road, Penniman Road, and Emery Road will be consistent with the vision of the neighborhood street which includes on-street parking, trees along the curb, and a setback zone to provide a buffer to residential ground floor units.

1.5.4 *New Retail and Service Development*

The project will provide approximately 2,700 square feet of ground floor retail or restaurant space, which will both create pedestrian activity around the Site and the neighborhood and provided amenities to the neighbors and residents of the Project. As noted above, retail is proposed along Braintree consistent with The Planning Study vision.

1.5.5 *LEED Certifiable Building*

The Project is being designed to achieve a LEED Silver Certifiable Level for Residential Mid Rise (LEED MR). This requires the project team to commit to incorporating environmentally sustainable design elements into the design. These elements will improve the efficiency of the building, help protect the local and global environment, and improve the quality of life for the Project residents as well as the neighborhood. Further discussion of the sustainable design and practices can be found in Chapter 4.0 Sustainability.

1.6 Summary of Required Permits and Approvals

Table 1-1 below sets forth a list of federal, state and city agencies which permits or other actions are expected to be required:

Table 1-1: Anticipated Permits and Approvals

Agency Name	Permit / Approval
FEDERAL	
United States Environmental Protection Agency	National Pollution Discharge Elimination System
STATE	
Department of Environmental Protection, Division of Air Quality Control	Air Plans Approval; Pre-Construction Notice
Massachusetts Water Resources Authority	Construction Dewatering Permit
CITY OF BOSTON	
Boston Landmarks Commission	Article 85 Demolition Permit

Boston Civic Design Commission	Review and Approval
Boston Planning and Development Agency	Article 80B, Large Project Review; Cooperation Agreement; Affordable Housing Agreement
Boston Water and Sewer Commission	Sewer Use Discharge Permit; Site Plan Approval; Construction Dewatering Permit; Sewer Extension/Connection Permit; Stormwater Connection
City of Boston Committee on Licenses	Flammable Storage License to Erect a Parking Garage
City of Boston Inspectional Services Department	Building and Occupancy Permits
Boston Public Improvement Commission	Street and Sidewalk Occupation Permits; Specific Repair Plan;
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Boston Board of Appeals	Zoning Code Variances
Boston Parks Commission	Approval of construction within 100 feet of a park

1.7 Project Team

Project Name:	Proposed Mixed Use Development 40 Rugg Road
Location:	The Project is located within the Boston neighborhood of Allston along Rugg Road, Braintree Street and Penniman Street
Proponent:	The Michaels Organization 3 East Stow Road Marlton, NJ 08503 Kristina Vagen Jay Russo
Architect:	DiMella Shaffer 281 Summer Street Boston, MA 02210 617-426-5004

	Frank Valdes, AIA Tal Shifriss
Legal:	Robinson & Cole LLP One Boston Place, 25th Floor Boston, MA 02108 800-762-2678 Timothy Twardowski
Civil Engineering & Permitting Consultant:	Bohler Engineering 75 Federal Street, Suite 620 Boston, MA 02110 617-849-8040 Stephen Martorano, PE Timothy Hayes, PE
Transportation Consultants:	Kittelson & Associates 50 Congress Street, Suite 935 Boston, MA 02109 857-265-2153 Ellen Donohoe-Moshier, PE, ENV SP
Environmental Consultant:	AEI Consultants 112 Water Street Boston, MA 02109 857-350-3519 Stephen Graham, PE, LSP
Geotechnical Consultant:	Northeast Geotechnical, Inc. 6 Hart Circle Georgetown, MA 01833 508-598-3510 Mark Zambernardi, PE
Mechanical, Electrical and Plumbing Systems and Fire Protection:	Consulting Engineering Services 128 Carnegie Row, Suite 204 Norwood, MA 02062 Douglas Lajoie, PE
Landscape Architects:	Bohler Engineering 75 Federal Street, Suite 620 Boston, MA 02110 617-849-8040 Matthew Mrva, RLA
Acoustical, Air Quality & Wind Consultants:	Tech Environmental 303 Wyman Street 295 Waltham, MA 02451 781-890-2220

	Mark C. Wallace, QEP, INCE
LEED Consultants:	New Ecology, Inc. 15 Court Square, Suite 420 Boston, MA 02108 Maciej Konieczny, CEM, CBCP, LEED AP
Public Relations:	Solomon McCown 177 Milk Street Boston, MA 02109 Daniel Cence
Structural Engineer	L.A. Fuess Partners 101 Federal Street, Suite 502 Boston, MA 02110 Aaron Ford, PE

2.0 PROJECT DESCRIPTION

2.1 Project Site and Surroundings

The Proponent proposes to redevelop 82,325 square feet of land area ("the Site") bounded by Braintree Street to the north, Penniman Road to the west, Rugg Road to the East and existing industrial buildings to the South. See Figure 2-1 Existing Conditions Survey.

The site is currently occupied by four existing buildings ranging between one to two stories, including associated surface parking areas, sidewalks and temporary trailers.

Adjacent to the site there are two parcels facing Penniman Road - 30 Penniman contains an existing 4-story masonry building and 20 Penniman, currently under construction, will contain a 5-story 36-unit condominium building. Beyond its border streets, the Site is facing a 5-story 80-unit residential building at 61-83 Braintree Street that is currently under construction; the Penniman Road Play Area park and the Millwright Apprentice & Training Center on Penniman Road; multiple commercial / office buildings on Rugg Road; and Brighton Moving and Storage at its south border with Hano Street beyond.

The Project is located less than one quarter of a mile from the new Boston Landing MBTA Commuter Rail Station and in close proximity to several MBTA bus routes. MBTA bus routes 64 and 66 run along Cambridge Street and MBTA bus routes 57 and 66 run along Brighton Avenue and Harvard Avenue. Additionally, the Site is located approximately 0.5 miles from the Harvard Avenue Station of the MBTA Green light-rail system. The project proximity to these pedestrian amenities is reflected in the "Walk Score" for the Project Neighborhood, which scores a 96 where daily life and errands do not require a car.

All existing sidewalks adjacent to the Site will be reconstructed as part of the construction process and will incorporate design elements recommended in the Boston Complete Streets Guidelines and Brighton Guest Street Area Planning Study.

The Site is located within the area of the Brighton Guest Street Area Planning Study, dated March 2012 (the "Planning study") and has been identified by the Planning Study as an area designated as having "significant capacity" and "immediate potential" for development. The proposed project complies with the Planning Study vision for "an urban mixed use district featuring vibrant community uses and residential development."

2.2 Proposed Project

The proposed Project entails the development of two new, 6-story residential buildings with ground floor retail space and an automated parking structure. The buildings will contain 261 rental apartments, 34 of which will be affordable units. The Project will also include ground floor retail and common spaces for residents. The majority of parking will be provided by a 168-space automated parking garage and 12 additional spaces provided at grade. Building A and B will be located in an "L"-shape configuration along the southern and eastern boundaries of the Site; Building C will be located in a "C"-shape configuration on the northern side of the site, wrapping around the parking structure. Vehicular access will be provided from Penniman Road.

Currently the Site and the existing structures on the property do not provide a street wall or pedestrian-level activity. Consequently, in its current condition the Site is not an inviting environment for the public. However, in the context of new development along Braintree Street and Penniman Road, the Project will provide a much-needed urban revitalization and improved connections to nearby properties and public transportation as well as an enhanced pedestrian experience.

The Site is relatively flat and contains varied soil conditions due to the Site's historical use as a laundry facility. On-site treatment of subsoils and the remediation of contaminants both on site and off site will be performed per Massachusetts Department of Environmental Protection (DEP) regulations. These conditions are discussed further in Section 5.10 Geotechnical.

A new green space will be created within the Site with direct access from each building's ground floor amenity areas for use by its residents.

The combined footprint of the buildings, including the parking garage, is approximately 50,200 square feet, or approximately 60% of the 82,325 square feet site. The total Gross Floor Area (GFA) of the Project is 294,400 square feet, providing a Floor Area Ratio (FAR) of 3.6, for which a variance will be requested from the Zoning Board of Appeal.

Figure 2-1: Existing Conditions Survey

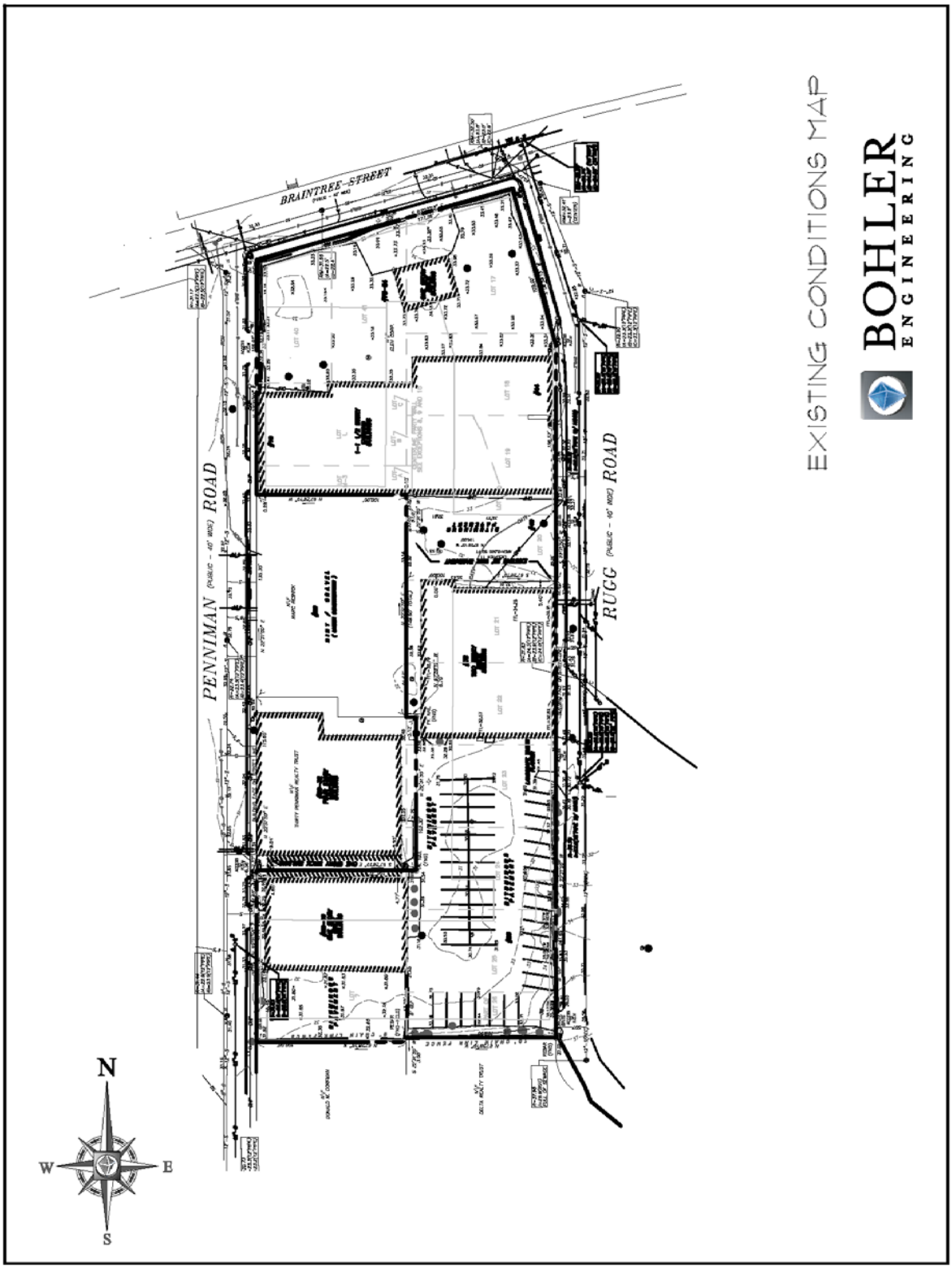


Figure 2-2: Site Plan

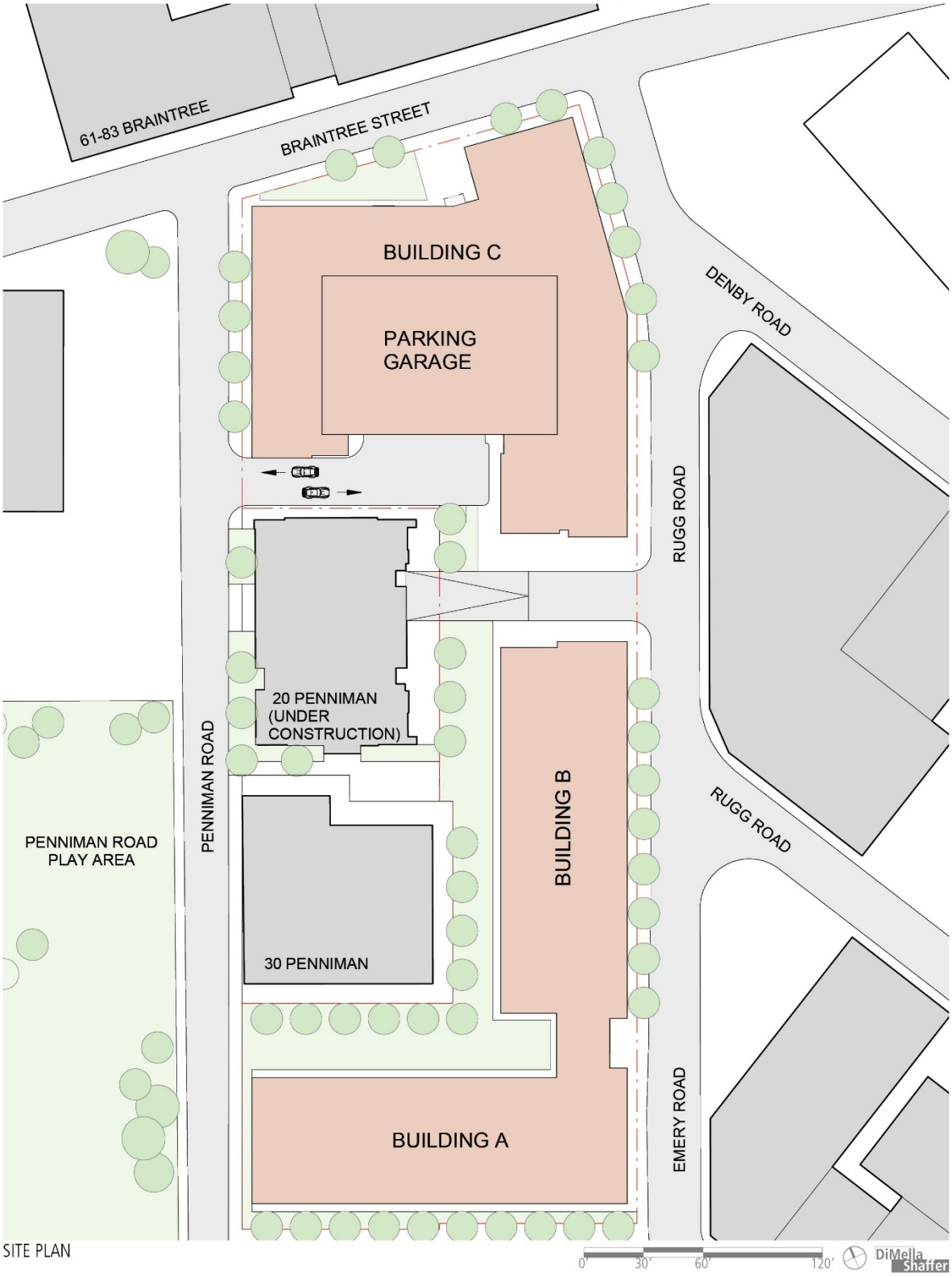


Figure 2-3: Ground Floor Plan

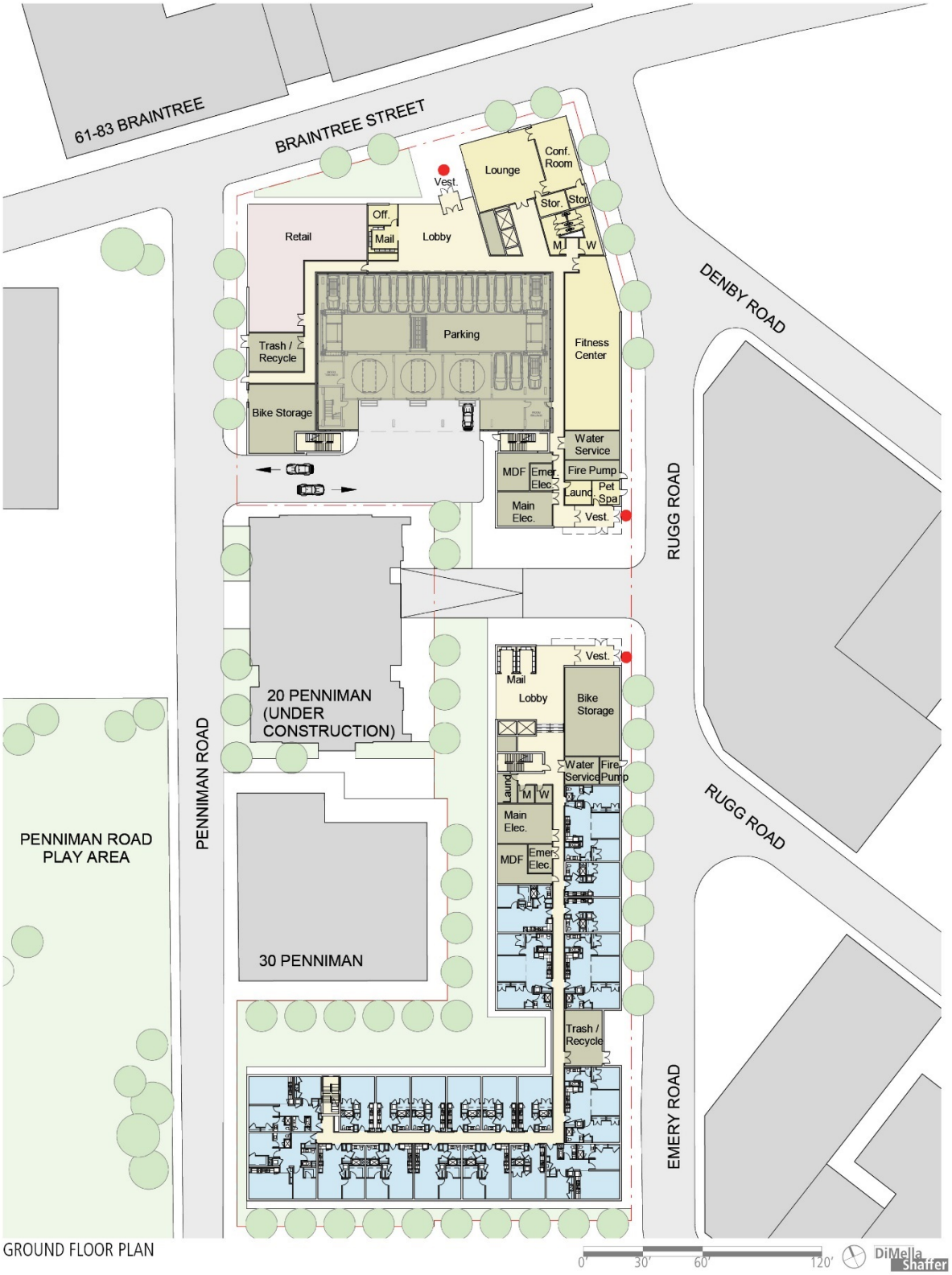


Figure 2-4: Level 2-6 Floor Plans

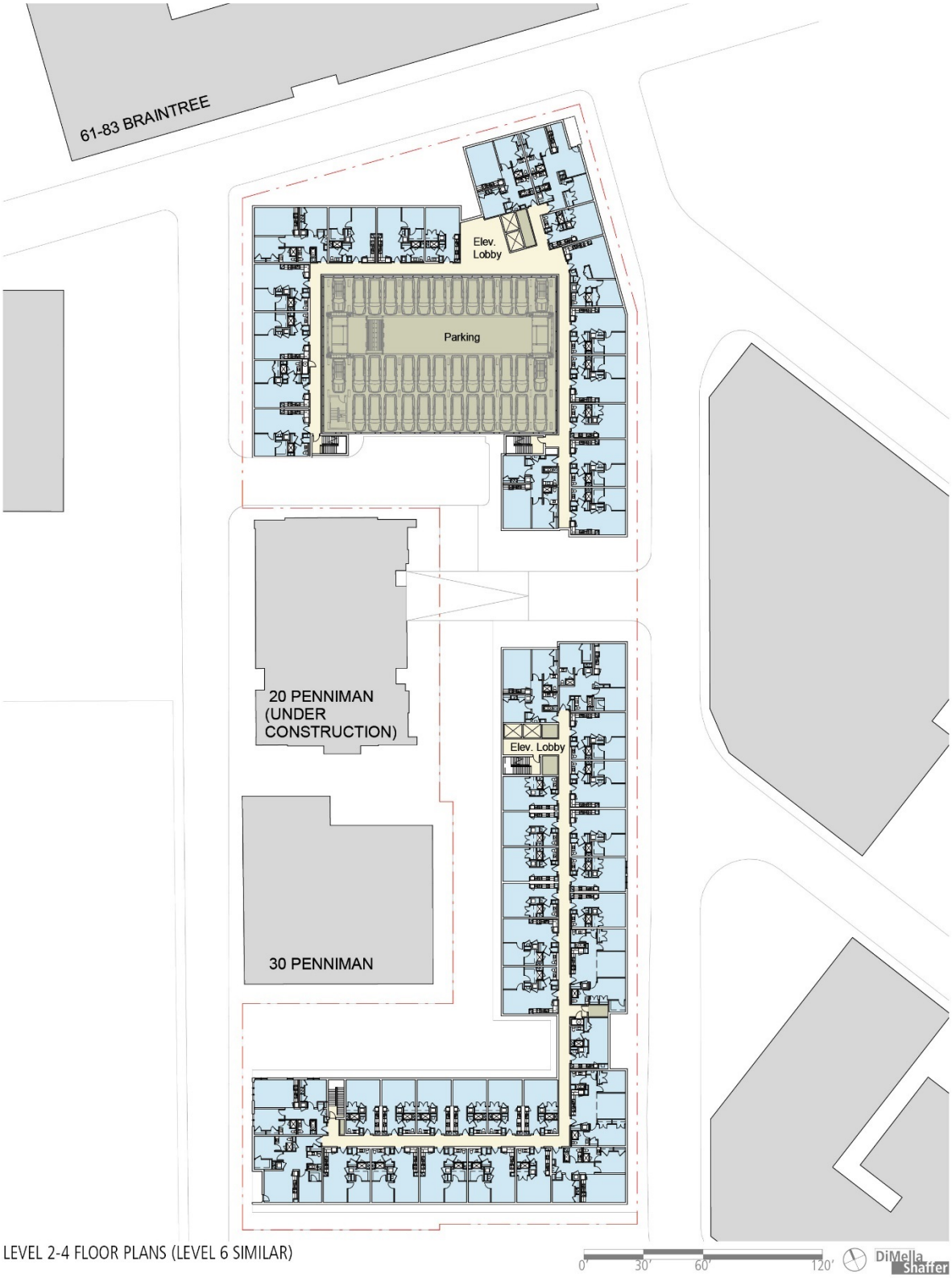


Figure 2-5: Level 5 Floor Plan

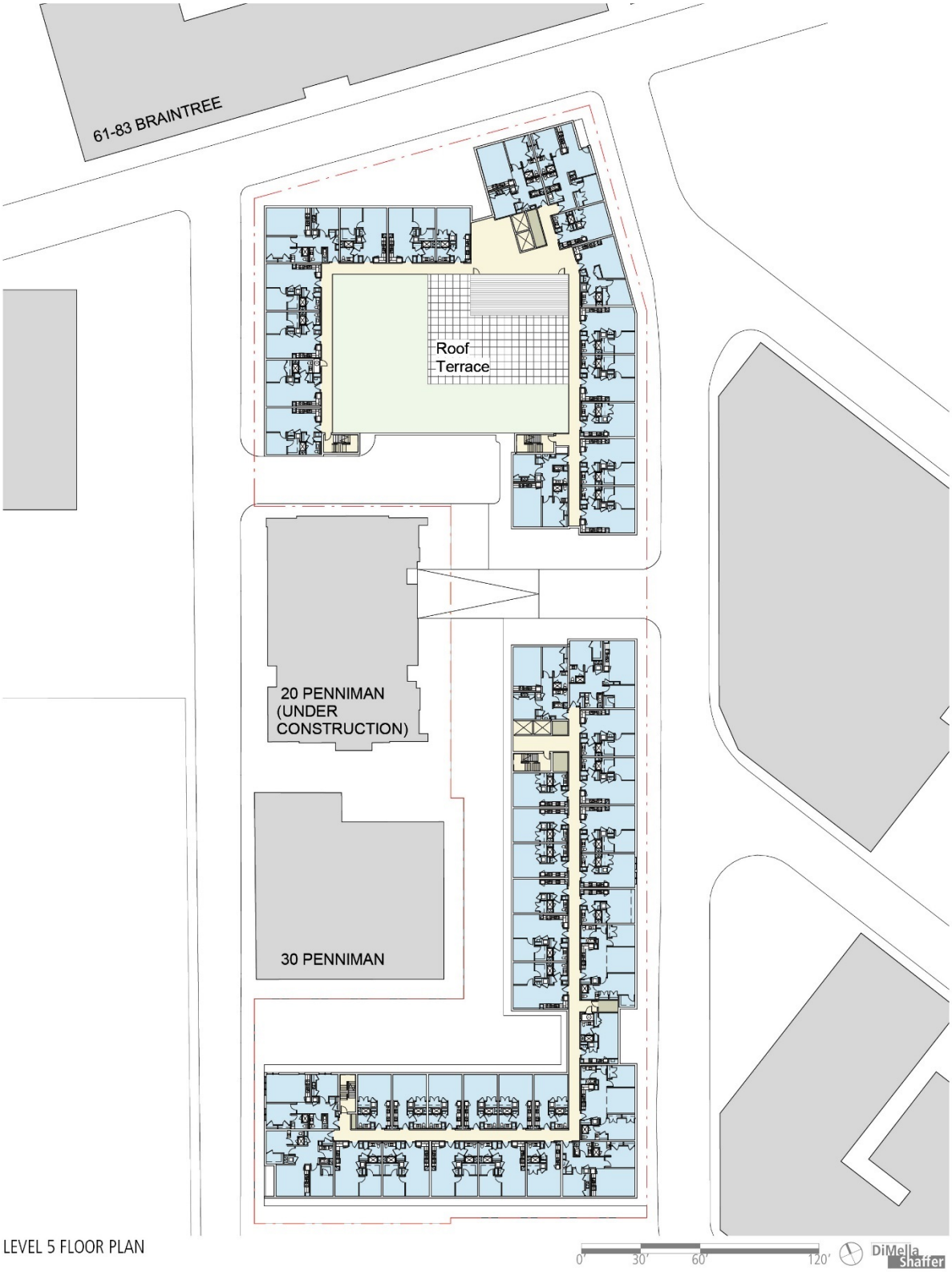


Figure 2-6: Roof Plan

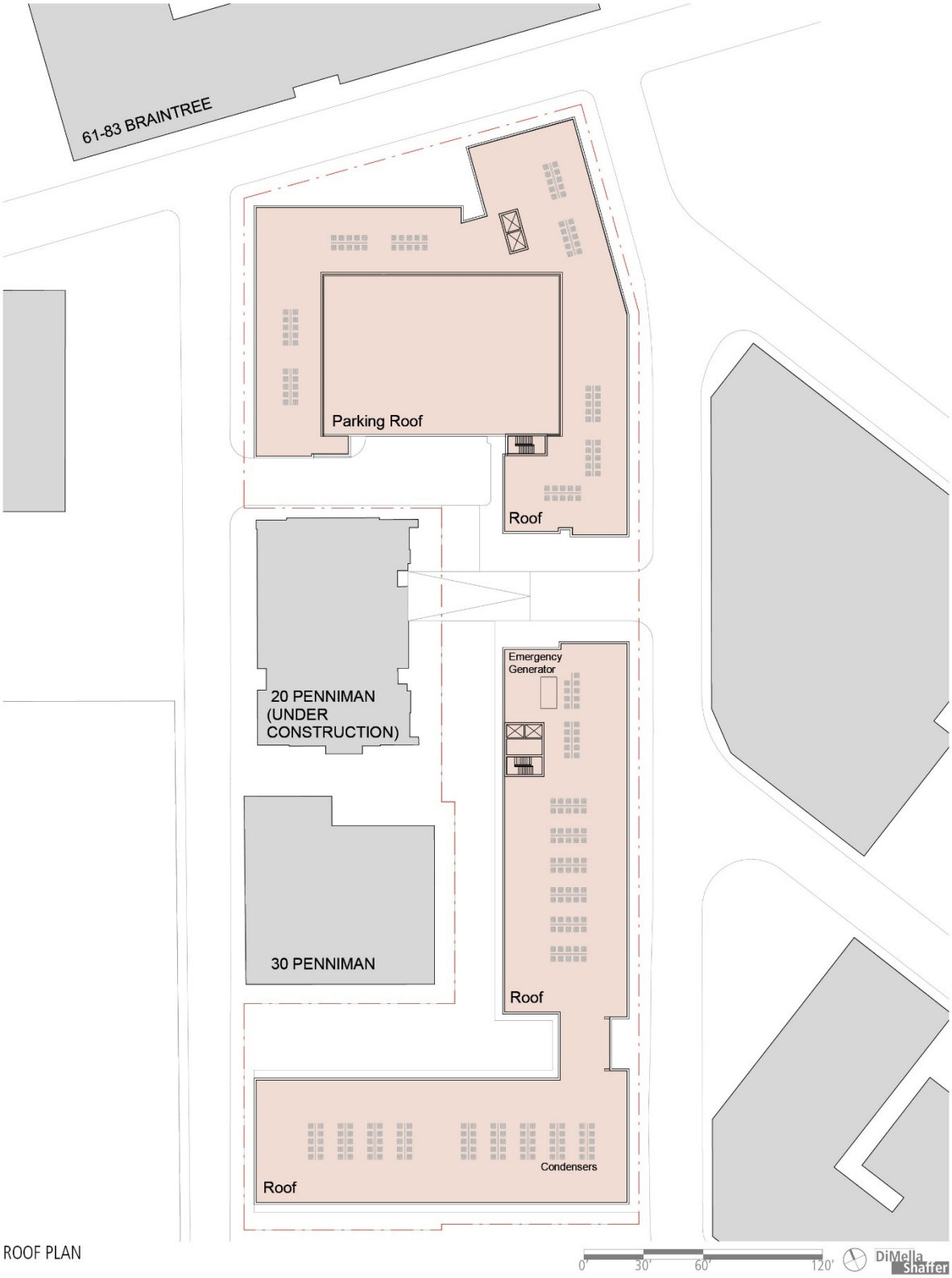


Table 2-1 Project Program

Project Component	Dimensions / Count
Gross Floor Area	294,400 SF
Floor Area Ratio	3.6
Parking	168 garage spaces + 12 surface spaces
Retail	2,700 SF
Ground Floor Amenities	14,000 SF
Residential	188,286 SF

2.2.1 *Ground Floor Uses*

The proposed building footprint for the new residential buildings is 41,700 square feet. Building C contains 2,700 square feet of retail at the ground floor level to the north along Braintree Street to activate the pedestrian realm along this portion of the building. The ground floor will also include a mix of one-bedroom and studio apartments within Buildings A and B, two central lobbies, a leasing office, resident spaces for lounges and community gathering, a fitness center, and common areas including bicycle storage, trash, and service functions. See **Figure2-3** Ground Floor Plan.

The Project will expand the current mix of ground floor uses in the area to activate and enhance the existing streetscape. Principal vehicular access will be provided through a new access driveway off of Penniman Road.

2.2.2 *Residential Units*

The proposed new apartments will provide a diverse mix of housing for the Braintree Street LI Subdistrict. The Project will provide a total of 261 dwelling units comprised of 94 studio apartments with an average of 505 square feet, 105 one-bedroom apartments with an average of 700 square feet, and 62 two-bedroom apartments with an average of 1,050 square feet. In Building A-B the dwelling units will be organized around a central corridor; in Building C, the dwelling units will be organized along a single-loaded corridor, wrapping around the parking structure. The layout and shape of the buildings are intended to provide an efficient footprint that will create an urban edge along the border street while keeping the

parking structure off of the public realm. The sixth floor of Building C will provide a direct access to a residential roof deck on top of the parking structure.

Table 2-2: Project Program

Level	Studio	One-Bedroom	Two-Bedroom	Total Units
01	9	5	7	21
02	17	20	11	48
03	17	20	11	48
04	17	20	11	48
05	17	20	11	48
06	17	20	11	48
Total	94	105	62	261

2.2.3 *Parking and Access*

The Project will be located partially on an existing parking lot that currently contains 45 surface-level parking spaces. The existing parking lot will be removed and replaced with 168 new spaces in a 5-story automated parking garage and 12 surface-level spaces (including 2 handicapped spaces). All of the parking garage spaces will be reserved for use by residential tenants. The surface-level spaces will be available for shared use by retail/commercial patrons, residents and visitors.

The automated parking system introduces a green, safe, and convenient parking solution. The system allows vehicles to be stored with a greater density than conventional parking systems and therefore conserves open space. Upon arrival, the driver will park the car in one of the loading turntables and leave the building. A sensor then analyzes the vehicle size and takes it to an empty space. Upon returning, the driver will scan a card or key and the system will bring it to one of the exit bays.

Access to the parking garage will be provided by a new driveway off of Penniman Road. Vehicle pick up and drop off to the buildings, and visitor parking will be accessed from Rugg Road by a driveway that is shared with the property located at 20 Penniman Road, which has access rights via a deeded easement.

2.2.4 *Landscaping*

A new landscape area of approximately 12,500 square feet will be created between Building A-B and the two neighboring residential buildings on Penniman Road. The green courtyard will provide residents of the Project with pedestrian access to nearby recreational and natural amenities across Penniman Road.

To enhance the street scape on Penniman Road, the parking garage is located in the center of Building C. To re-create the ground level open space, the parking structure rooftop will serve the tenants as an outdoor amenity space and include the implementation of both hardscape and softscape elements.

Outdoor seating areas may be provided in front of the retail space and residential entrance on Braintree Street. Streetscape along the public right of ways surrounding the project will be designed per Boston Complete Streets standards.

2.3 Compliance with Boston Zoning

The Project is subject to land use controls contained in the City of Boston Zoning Code. In accordance with Article 80B of the Boston Zoning Code, the project is subject to the requirements of Large Project Review because it exceeds 50,000 square feet of gross floor area. The Project also will be subject to review by the Boston Civic Design Commission under Article 28.

The Project is located within the Allston-Brighton Neighborhood District, governed by Article 51 of Boston Zoning Code and is also located in the Braintree Street Local Industrial Sub District designated LI-1. The Site is also included within the area of the Brighton Guest Street Area Planning Study dated in March 2012, which establishes a long-term vision for the area as an innovative and vibrant mixed use urban destination. The Project has been designed in accordance with this vision.

To the extent possible, the Project has been designed to comply with the applicable zoning requirements. Although the Planning Study identifies "rental residential land uses" as one of the most viable in the area and establishes a long-term vision of the area as an "urban mixed-use destination with vibrant community and residential uses," multifamily dwellings are not permitted under Article 51 of the Zoning Code. Under the current zoning, the applicable dimensional requirements for the Site include a maximum FAR of 1.0 and a maximum building height of 35 feet. However, the Planning study recommends that this area have an increased FAR ranging from 1.25 to 3.25 and a height limit of 60-110 feet (6 to 12 stories). Because the Project will have an FAR of 3.6 and a

building height of 69 feet, the Proponent will request the necessary variance relief from the Zoning Board of Appeal.

The project is subject to Article 37 (Green Building) of the Zoning Code. It will therefore be designed and constructed to be LEED certifiable. See Section 4.0, Sustainable Design for a discussion of LEED credits that the project intends to achieve.

2.4 Alternatives Analysis

This section summarizes the project impacts of a No Build Alternative, an As-of-Right Alternative, and the Preferred Alternative as it has evolved since Preliminary Design.

2.4.1 No Build Alternative

The No Build Alternative would leave the Site as it exists currently – approximately 1.89 acres of underutilized industrial buildings and surface parking lots. The associated housing stock increase would not occur. The creation of new market rate and affordable housing would not exist. Additionally, the redefinition of this part of Braintree Street would not occur, because the retail and residential street wall would not be developed. There would be no improvement to pedestrian access on the surrounding streets. A No Build Alternative would be an underutilized design with uses that are not consistent with the Guest Street Planning Study. In addition, the No Build Alternative would provide no remediation of the onsite contamination. The value of this parcel is not only its individual development, but also in its effect on the community at large.

2.4.1.1 Impact Summary

Under the No Build Alternative, the existing sewer and water generation rates would remain the same with no increase in water, sewer, or inflow and infiltration revenues to the City of Boston.

The stormwater management system would not be improved and would remain the same as it exists today. Currently, Site is covered with a mix of paved parking areas and existing buildings amounting to nearly 100% impervious area. The stormwater runoff from the existing building and parking areas flows untreated toward existing drainage structures within Braintree Street, Penniman Road and Rugg Road. There are currently no modern Stormwater Best Management Practices on site.

Under the No Build Scenario, there is no change to the traffic nor the vehicle trips per day.

Under the No Build Scenario, the Greenhouse Gas Emissions would be unchanged from the current condition.

There are no new land impacts under the no-build alternative.

In summary, the no build alternative would leave the Site as it exists today and would provide none of the added benefits of housing, affordable housing, urban development, community contributions and environmental improvements would be experienced by the Site, the neighborhood, or the City of Boston.

See Figure 2-7: No Build Alternative for an existing conditions plan of the current site.

2.4.2 As-of-Right Alternative

Per BPDA standards an as-of-right alternative design has been considered which included buildings that conform to the dimensional requirements of underlying zoning, i.e. allowed by Article 50 of the Boston Zoning Code.

The underlying zoning for the project site is Allston/Brighton Neighborhood, Braintree Street Local Industrial which allows commercial uses such as light manufacturing and office. An As-of-Right alternative would likely maintain the current lot layout and not combine the lots into a cohesive parcel. Additionally, proposed developments would be restricted to a maximum floor area ratio of 1.0 and a building height of 35 feet under current zoning. As such, the As-of-Right alternative would likely consist of five 1-2 story light industrial, retail and/or office uses.

Due to the decrease in program density and height, the resulting project would have decreased traffic and shadow impacts. However, such a development with the reduced scale and program would not meet the expectations of the community and the Planning Study for the area, which, as noted previously, envisions “an urban mixed use district featuring vibrant community uses and residential development.” As detailed below, without this Project as it is proposed in the preferred development scenario, the many associated benefits, including the full level of creation of construction and full time jobs, additional housing and retail space would not be realized. Additionally, a reduced scale

project would not be able to undertake the significant contamination remediation efforts outlined in the Preferred Alternative.

2.4.2.1 Impact Summary

To analyze the As-of-Right Alternative, a conceptual development was considered that adheres to the underlying zoning bylaws. As such, an As-of-Right Alternative would generate an estimated 6,200 gpd of sewer discharge and use approximately 6,820 gpd of water depending on building use as industrial, retail or office. Under this alternative the Proponent would pay substantially less in water and sewer fees to the City, as well as contribute less inflow and infiltration fee as compared to the Preferred Alternative.

Under the As-of-Right development alternative the traffic would increase over the No-Build Alternative and be less than the Preferred Alternative. Although the increase will be less than the Preferred Alternative, the As-of-Right Alternative would not include the proposed mitigation, the surrounding streets would not experience pedestrian improvements and enhanced accessibility.

The overall land would be impacted under this scenario by developing the site into an assumed 95% impervious area. Current zoning does not require minimum setbacks while the preferred alternative proposes 10' setbacks. The site layout would not lend itself to any plaza space and gathering areas and the only vegetated areas would come from minimal site vegetation and potential street trees.

The As-of-Right alternative would not conform to the Planning Study and would not provide any added benefits to help establish a vibrant community.

As stated above, under the current zoning bylaws the project would have very little density, minimal open space, and would not adhere to the use or density goals as outlined by the Planning Study. A likely development would contain individual buildings with parking lots as a leveled parking structure would not be economically feasible based on the industrial uses. Additionally, with a decreased program, the job creation and the community benefits would not be possible.

2.4.3 Preferred Project Alternative

As detailed in the project summary the Proponent proposes to redevelop the existing site with a vibrant, economically feasible mixed-use residential and retail development. The Project will include two new 6-story buildings with a combined total of approximately 294,400 square feet, that will contain 261 rental apartment units, 2,700 square feet ground floor retail space, residential amenities, and a 168-parking space automated valet parking structure.

In addition, the retail and residential elements of the Project contribute to the City's vision for this neighborhood as outlined in the recent Planning Study. This Project will enhance this section of Braintree Street and act as a catalyst for future development and encourage more projects to invest in the surrounding area.

The Project will also provide other benefits to the City of Boston including enhancements to the neighborhood, increased local, state, and federal tax revenues, construction and permanent jobs.

The Proponent will continue to work with the Boston Transportation Department (BTD) and BPDA in an effort to achieve a comprehensive design that is integrated with the surrounding community. The preliminary design called for the parking structure to have frontage and access along Penniman Road. After conversations with the BTD and BPDA, it was determined that this design would have less favorable traffic impacts and would not provide the pedestrian friendly use along Penniman Road consistent with the Complete Streets Initiative and Guest Street the Planning Study. Additionally, the community seeks to preserve the residential feel of Penniman Road which could not be realized with the parking structure's original location. The Proponent in receipt of these comments has developed the preferred alternative with the parking structure set back within the property allowing for improved traffic patterns and more pedestrian accessible routes around the project. See figure 2-8 for the Original Design and figure 2-9 for the Revised Preferred Alternative.

Figure 2-7: No Build Alternative

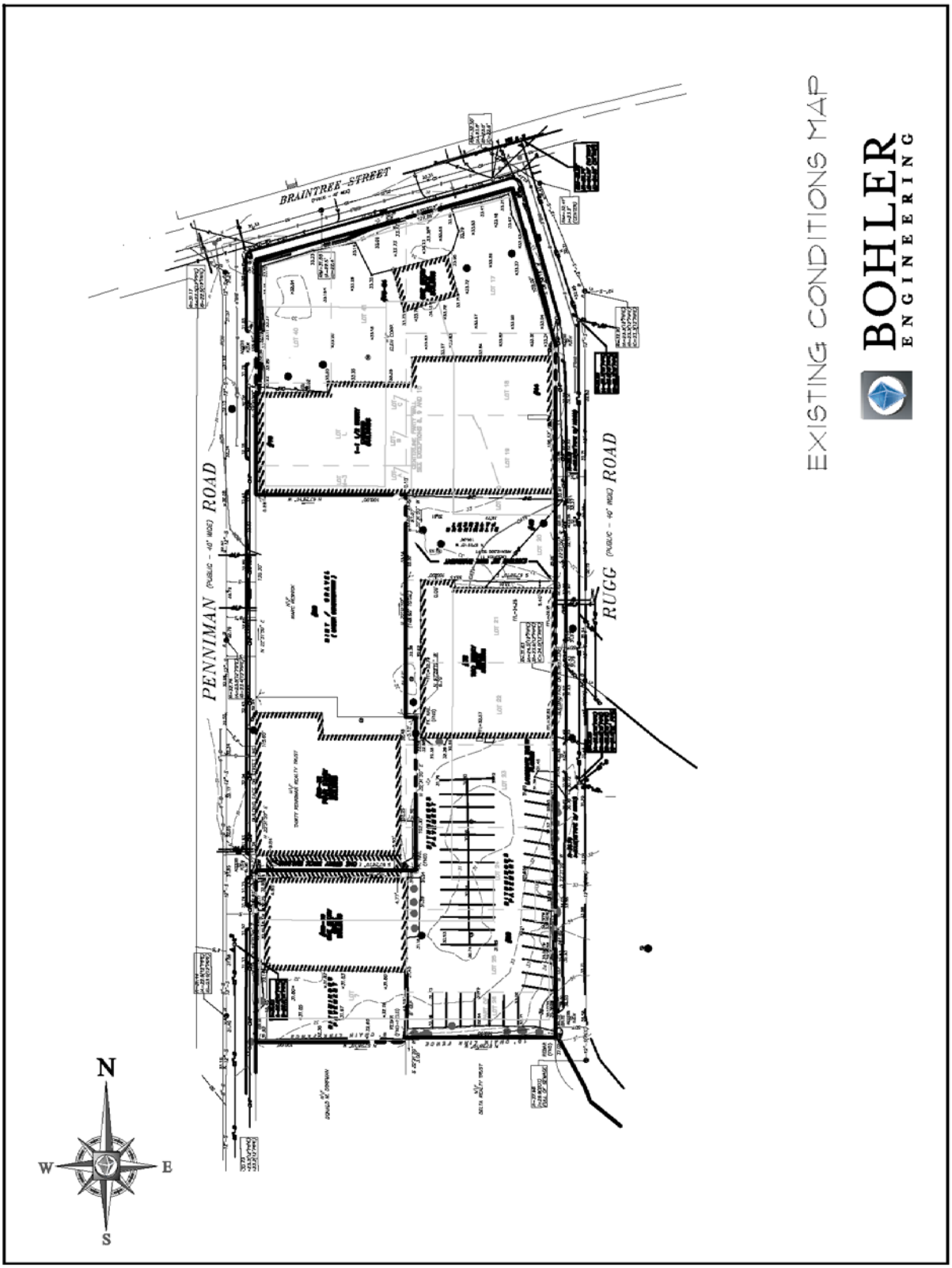
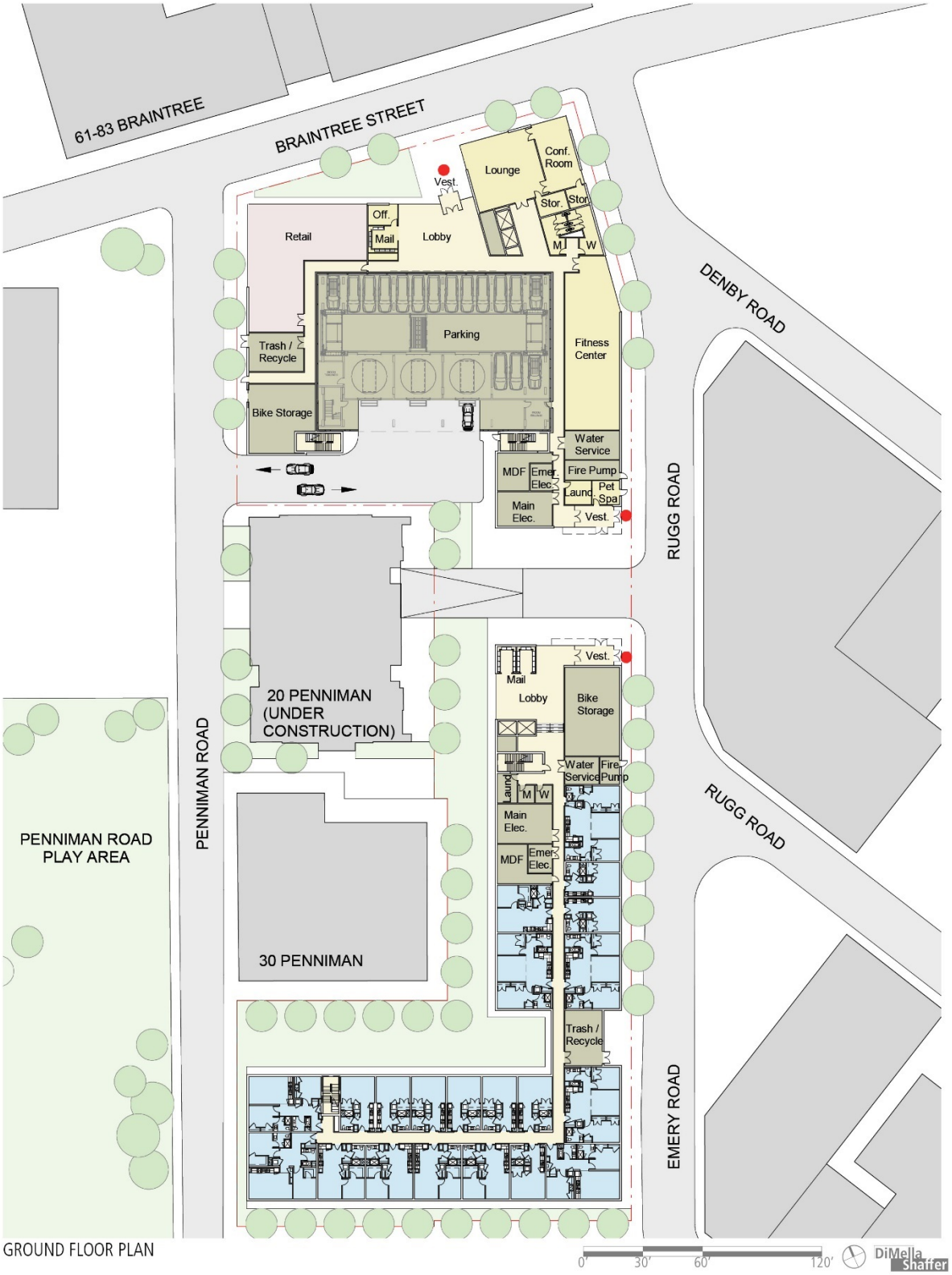


Figure 2-8: Original Design – Ground Floor Plan

Figure 2-9: Revised Preferred Alternative - Ground Floor Plan



Currently, the Project Site is an untested area for commercial activity. There is little retail and pedestrian activity surrounding the site. No new market rate housing has yet to emerge. Taking these leasing dynamics into consideration, and the vision outlined by the Planning Study, the Proponent identified a ground floor retail component, residential lobby, and amenity space along with upper floor residential as the best use group to economically drive the development of the Site. The Site's adequate frontage along Braintree Street and unique location within the Guest Street Planning Study area will help to revitalize the area, provide a complementary use to the surrounding developments happening in the area, and help to promote future growth in the neighborhood and Braintree Street LI Subdistrict.

2.4.3.1 Impact Summary

The Preferred Alternative will generate an estimated 38,030 gpd of sewer discharge and use approximately 38,850 gpd of water. Per conversations with the Boston Water and Sewer Commission (BWSC), the City's infrastructure has the capacity to meet the water and sewer needs of the Preferred Alternative. The Proponent will pay the City additional water and sewer fees, as well as a substantial inflow and infiltration fee to upgrade the infrastructure.

The Preferred Alternative will dramatically improve the existing stormwater management system by utilizing Stormwater Best Management Practices to meet current stormwater quality standards, emulate groundwater recharge, and control the peak flow of stormwater runoff over existing conditions.

The Preferred Alternative will include necessary mitigation for traffic impacts including Traffic Demand Management (TDM) measures, bicycle amenities, real-time transit information in building's lobby, guaranteed ride home program, car sharing and discounted ZipCar rates, transportation awareness events and transportation information and material.

The Preferred Alternative will meet the State Stretch Code requirements and Boston's Article 37 – Green Buildings and Climate Resiliency Guidelines. Section 5.6 fully describes the greenhouse gas analysis of the Preferred Alternative.

The Site will incorporate Boston Complete Street Initiatives, open plaza areas, and various vegetated areas to create a vibrant community space.

Additionally, the Preferred Alternative achieves the goals of the Guest Street Planning Study by providing vibrant community mixed-uses and residential development. The development will also provide economic benefit in the form of construction and permanent jobs.

2.4.4 *Alternatives Analysis Conclusion*

After thorough analysis of possible project alternatives, it was determined that the Preferred Alternative provides an economically feasible project that best achieved the goals of providing job and wealth creation, meeting the intent of the Guest Street Planning Study, and economic benefit to the area. Other alternatives were found to hinder the Proponent's ability to provide ample job creation, economic benefit, and community benefits while still being a practical venture. The Preferred Alternative generates the greatest benefits to the local community, provides a harmonious project to the other developments in the area, and meets the goals of the Planning Study.

3.0 URBAN DESIGN

3.1 Intro

40 Rugg Road ("the Project") is being designed to provide a much-needed urban revitalization and enhanced pedestrian experience in the Braintree Street District and its surrounding area. The project is a substantial contributor to the vision of the Guest Street Planning Study completed in March 2012, initiating an innovative and mixed-use urban destination in the Allston Brighton Neighborhood District. A key aspect of the Planning Study is connecting the Guest Street area to its adjacent neighborhood and public transportation. Aligned with this goal is the recommendation for a denser mixed-use fabric with live/work, residential, retail and active/recreational uses along the primary streets.

The site is an 82,325-square foot lot bound by Braintree Street to the north, Penniman Road and Rugg Road to west and east, and existing industrial buildings to the south. The parcel is currently subdivided into five parcels and occupied by four existing buildings and associated parking areas, various utilities and landscaping. With two new multi-family developments, currently under construction adjacent to the site, there is the opportunity of enhancing the evolving neighborhood community. The Project will be an important component in activating Braintree Street and improving the overall pedestrian experience between Guest Street and the new Commuter Rail Station and Cambridge Street.

Buildings in the immediate area have varied scale and use, from residential to industrial, providing a promising setting for a diverse, creative urban fabric. The Project will be an important link connecting pedestrians approaching from the busy Cambridge-Brighton intersection to the new Braintree / Guest Street corridor.

The Project will be built along the street edges at the perimeter of the site, providing a green internal courtyard for the tenants to enjoy while providing a visual link to Penniman Road Park across the street. Retail space, entrance lobbies for residents, a transparent first floor façade that displays the interior community and amenity spaces and the landscaped courtyard, will all work together to further activate the public realm within precinct.

3.2 Massing

The immediate area is characterized by different scaled, mixed-use buildings surrounded by surface parking lots enclosed with chain-linked fences, effectively making the streetscape uninviting to pedestrians. The Guest Street Planning Study provides height

and density guidelines for new developments to promote a rich range of building forms and massings appropriate to the proposed new hierarchic street network system nearby. The largest and tallest structures are proposed along the Turnpike, having a Floor Area Ratio (FAR) range of 3.0 to 4.0 and a height limit of 150' (10 to 13 stories) - gradually stepping down in height and density to merge into the adjacent neighborhoods. Included in this zone, the Project Site is an important edge to the current low-profile, industrial blocks between it and Cambridge Street that over time will become a denser setting as roadway and pedestrian path improvements are implemented, as adjacent sites are redeveloped and as the area ultimately takes form and becoming its own destination.

While the Planning Study provides guidelines for masses of 60 to 110 feet height on the Site, an intermediate building height of 69 feet is most suitable to the current demand and economics of the marketplace. The project approach is to break the mass into three 6-stories buildings – A, B and C (two of which are connected), placed along the perimeter of the Site, to define the southeast edge of the gateway to the upcoming residential neighborhood; to activate the south edge of Braintree Street; to wrap around an internal 5-level automated parking structure hidden from street; and to provide a green corridor between the new buildings and their neighbors.

Building C, located on the northern part of the Site, is the prominent element for pedestrians and vehicles approaching the site from Braintree Street. The building is configured as a "broken" C-shape, wrapping around the internal parking structure which is completely non-visible from the street. Instead of holding the Braintree Street edge, the massing follows the geometry of the parking structure. This results in a triangular pocket park outside the retail area and residential entrance and also diminishes the canyon effect with the new residential development underway on the north side of Braintree Street.

Buildings A and B, located on the southern part of the Site, are providing a visual residential edge for pedestrians and vehicles approaching the Site from Cambridge Street. The buildings are configured in L shape with central connector which breaks the mass into 2 structures. The buildings are organized with residential units facing both street and the new green space. See figure 3-1 through 3-2 for Architectural Elevations.

Figure 3-1: North and South Elevations

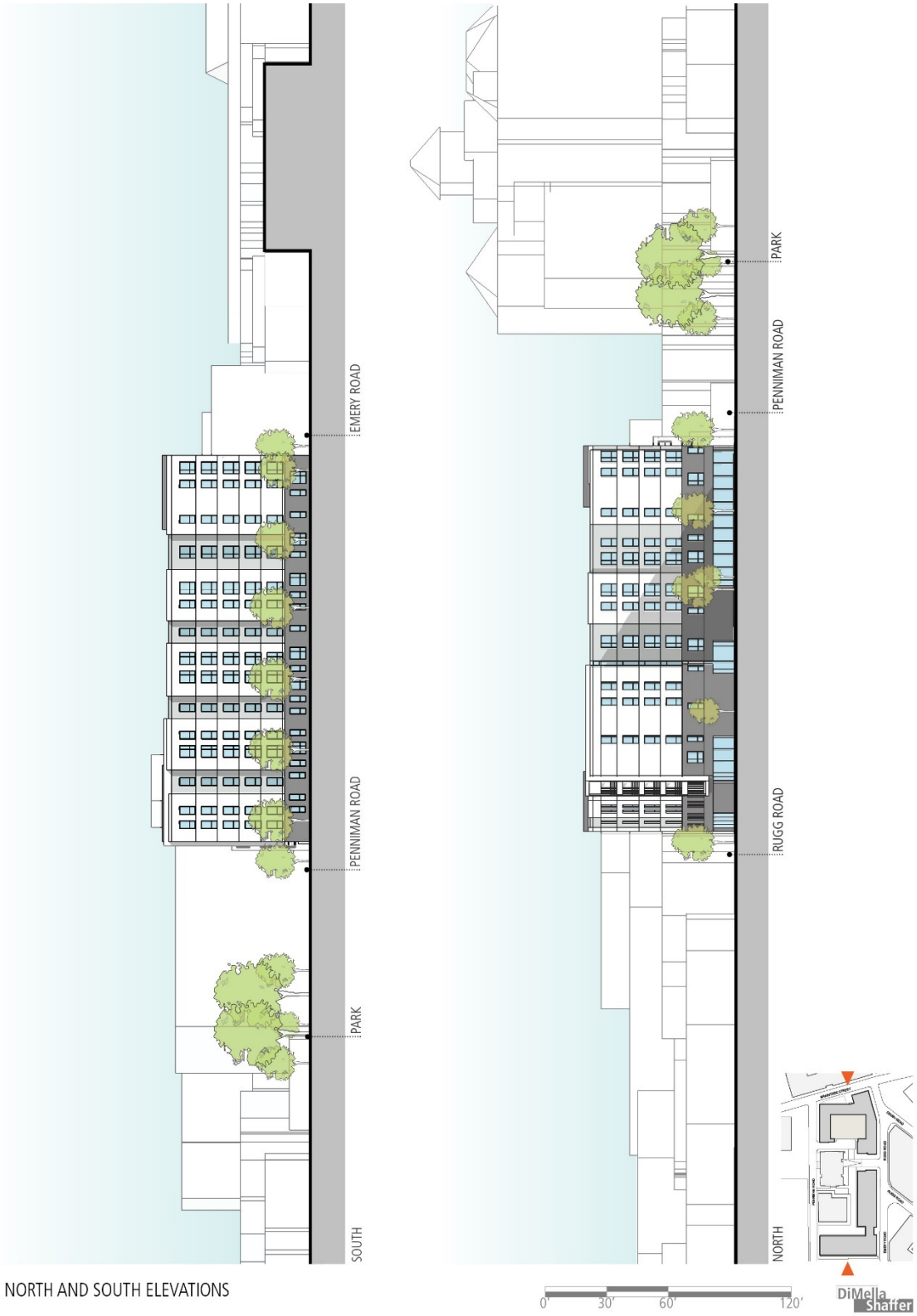


Figure 3-2: East and West Elevations

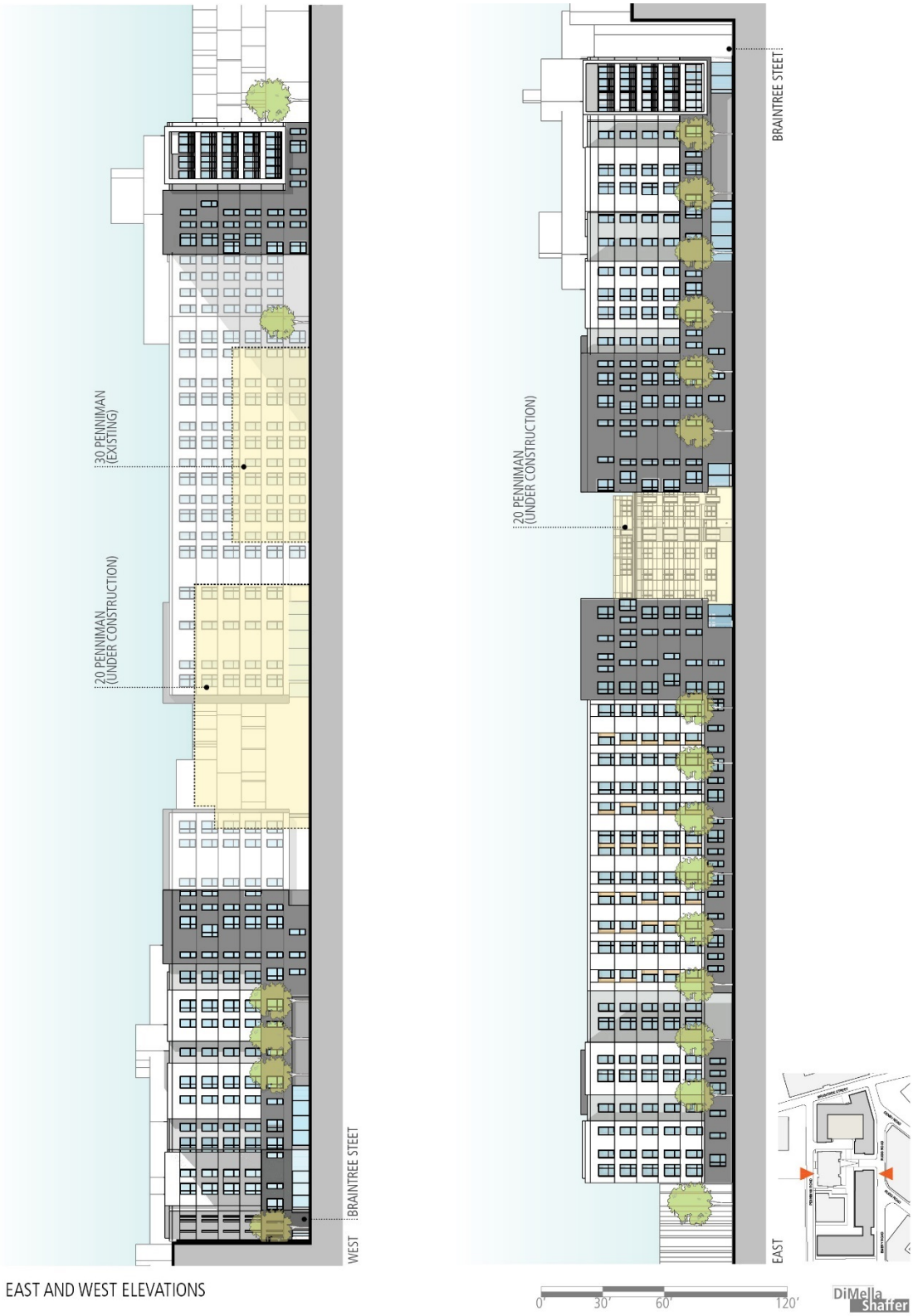


Figure 3-3: Aerial Views Looking East and West

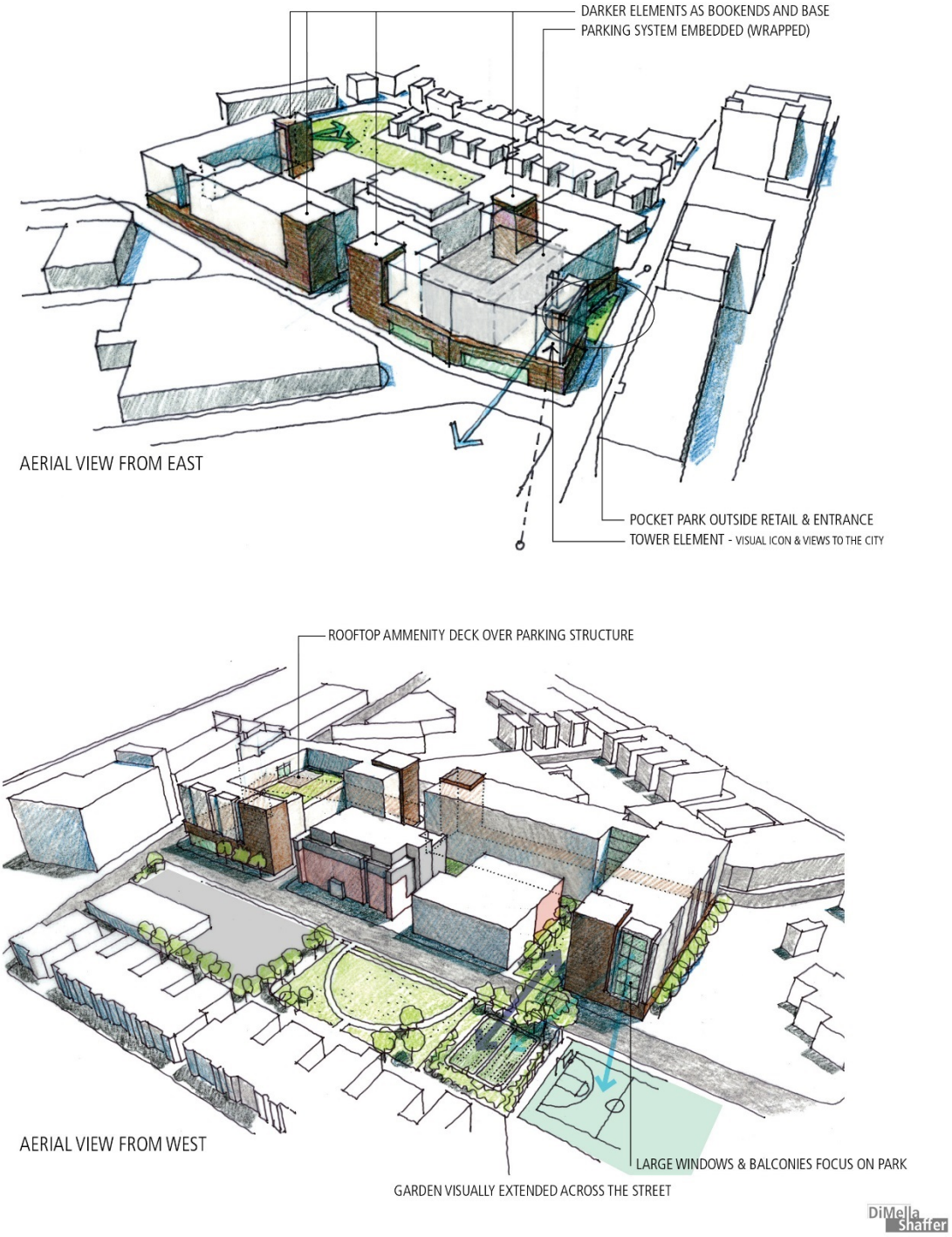


Figure 3-4: Views Looking East and West from Braintree St

VIEW LOOKING EAST FROM BRAINTREE ST

VIEW LOOKING WEST FROM BRAINTREE ST

DiMella Shaffer

Figure 3-5: Views Looking North from Rugg Rd and North-East from Penniamn Rd

VIEW LOOKING NORTH FROM RUGG RD

VIEW LOOKING NORTH-EAST FROM PENNIMAN RD

DiMella Shaffer

3.3 Character and Materials

The new buildings will provide diverse expressions, broken into primary and secondary components in a scale appropriate for a residential street. The design palette is proposed to be a combination of masonry, corrugated metal, fiber cement panels and EIFS, in reaction to the industrial vibe of the surrounding context. Balconies will be proposed in key locations where units can enjoy long views. Glazed retail space and residential amenities at ground floor will enhance pedestrian activity.

3.4 Landscape and Streetscape

The Project will reinforce the Braintree Street Corridor vision and pedestrian-oriented character by providing street level retail and active uses, streetscape improvements and landscaping. Pedestrian activity will be both enhanced and generated by retail at the street level and by residents who will live in the apartments above. The streetscape will include two vehicular travel lanes, parallel parking alternate with street trees, and wide pedestrian friendly sidewalks along both sides of the street. A pocket urban plaza is proposed in front of the retail space to allow outdoor seating.

Penniman Road will provide pedestrian linkage to the neighborhood to the west. The green courtyard will be visible from Penniman Road, enhancing the green open space across the street.

3.5 Consistency with Area Plans

The Site is located within the boundaries of the Brighton Guest Street Area Planning Study (the "Planning Study"), which was adopted by the BRA in March 2012. The Planning Study calls for future development in the area to create "an urban mixed use district featuring vibrant community uses and residential development." The Planning Study envisions Braintree Street as a live/work street with active as well as residential uses.

The Project is consistent with the vision established by the Planning Study by providing an active mix of residential housing and ground floor retail or restaurant space, which will both create pedestrian activity around the Site and the neighborhood and provide amenities to the neighbors and residents of the Project. By providing much needed urban revitalization and an enhanced pedestrian experience along Braintree Street, Rugg Road, and the surrounding area, the Project will be a substantial contributor to the Planning Study's vision of the area as an innovative and mixed use urban destination in the Allston-Brighton Neighborhood District.

4.0 SUSTAINABLE DESIGN

4.1 Sustainable Design Intro

This section provides an overview of the sustainable design elements proposed as part of the Project at this time of preliminary design to demonstrate that the Project will meet the requirements of Article 37 of the Boston Zoning Code relative to the City's Green Building policies and procedures. The Design team for the Project includes several LEED Accredited Professionals (AP), including Maciej Konieczny, (New Ecology, Inc.) and Douglas Lajoie (CES).

40 Rugg Road will incorporate sustainable principles into its design, construction, and continued operation activities. Each building will pursue a minimum of Silver level certifiability through the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design and Construction (BD+C) Multifamily Midrise rating system (LEED MR V4).

The project design includes the following sustainable principles:

- An integrated team, members of which will collaborate throughout the design and construction process;
- Environmentally friendly site design and consideration of landscaping to benefit both residents and the surrounding neighborhood;
- Efficient water use that minimizes waste and maximizes available technology;
- Energy efficiency through installation of high-efficiency equipment and a right-sized system design;
- Healthy materials and finishes throughout all interior spaces, reducing health risks for residents; and
- Effective ventilation and exhaust systems, designed to ensure continued health and air quality throughout the life of each building.

Regulatory Context

4.2 Massachusetts Stretch Energy Code

As part of the Green Communities Act of 2008, Massachusetts developed an optional building code that gives cities and towns the ability to choose stronger energy performance in buildings than the state building code (the "Stretch Energy Code"). The Stretch Energy Code increases the energy efficiency code requirements for new construction and major renovations or additions in municipalities that adopt it. Building typology includes multi-family residential buildings over three (3) stories.

In 2010, the City of Boston was designated a Green Community under the Green Communities Designation and Grant Program—an initiative of the Massachusetts Department of Energy Resources. In order to be designated a Green Community and, therefore, eligible for grant money available annually, communities are required to meet five rigorous qualification criteria one of which includes minimizing life-cycle costs, such as adopt and implement the Stretch Energy Code. The goal of the grant program is for a municipality to use grant money to assist residents, businesses, and the municipality departments/facilities reduce energy use or install renewable energy systems. For the City of Boston, the Stretch Energy Code was adopted and became mandatory on July 1, 2011.

The current Stretch Energy Code requires projects to achieve at minimum a 10 percent energy efficiency compared to the state's Base Energy Code by either meeting the performance standard of 10 percent better than ASHRAE 90.1-2013, or using a prescriptive energy code depending on building type. 40 Rugg Road development will comply with the Stretch Energy Code by exceeding the 10% threshold beyond ASHRAE 90.1-2013.

4.3 Article 37

Through Article 37 – Green Buildings, the City of Boston encourages buildings to decrease energy and water use and cost, improve the efficiency and useful life of building systems and infrastructure, and reduce the burdens imposed by buildings on city services, the environment, and public health. The stated purposes of the article are as follows:

> *"The purposes of this article are to ensure that major building projects are planned, designed, constructed, and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston."*

Any project that is subject to Article 80B, Large Project Review is also subject to the requirements of Article 37, which includes demonstrating that a project would meet the minimum requirements to achieve a LEED Certified level (all LEED Pre-requisites and achieve at least 40 points) without registering the project with the USGBC, or "LEED certifiable."

4.3.1 *Compliance with Article 37*

40 Rugg Road development intends to incorporate sustainable design and construction principles and practices into the Project, in compliance with the requirements of Article 37 of the Boston Zoning Code relative to the City's Green

Building policies and procedures. The development intends to take the appropriate measures to achieve a LEED Silver building. The preliminary LEED Scorecard is tracking 62 'yes' points and 9 'maybe' credits for a preliminary Gold rating. The 'maybe' points represent credits that will continue to be evaluated as design progresses. This represents a noteworthy increase in LEED points compared to 40 'yes' points for a Certified rating, as required by Article 37. 40 Rugg Rd building project will adhere to the LEED MR rating system. A preliminary checklist is included at the end of this Chapter.

4.4 LEED Overview

The following is a summary of LEED compliance for the proposed 40 Rugg Rd development.

4.4.1 *Integrative Process*

The Integrative Process (IP) category ensures the integration of sustainable principles throughout the design and construction phase, while also addressing growing concerns of building durability and longevity. The credit's intent is to maximize opportunities for cost effective adoption of integrative green design and construction strategies.

The Project will include team members from all related occupations including architectural, mechanical engineering, building science specialist, civil engineering and, energy and efficiency expertise. At least one LEED Accredited Professional will be on the team. Furthermore, the team will ensure that the selected contractor is knowledgeable and capable of implementing green features by completing a trades training session as dictated by the LEED system.

4.4.2 *Location and Transportation*

The Location and Transportation (LT) category addresses reduction of urban sprawl and rewards development on and near existing infrastructure, public transportation, and previously developed land.

The Project is a redevelopment of an existing, urban infill parcel, requiring no undeveloped land for its construction, providing access to existing utility lines and public transportation, as well as accessible open space for occupant recreation. The project location is outside of the 100 and 500 year floods as demonstrated by current FEMA maps.

The Rugg Rd location also provides its residents with walkable (within ½ mile) access to numerous neighborhood amenities, including restaurants, grocery stores, pharmacies, religious institutions, laundry services, and recreation facilities. For more distant trips, on-site bicycle storage will promote resident biking by maximizing available secure, covered storage spaces.

4.4.3 *Sustainable Sites*

The Sustainable Sites (SS) category addresses environmental issues related to landscape and site design, ensuring a seamless co-existence between the built environment and the natural environment.

The Project will ensure that installed landscaping includes only non-invasive plantings, maximizes drought-tolerance, and minimizes the need for irrigation.

Both the site design and building roofing will seek to reduce heat island effects by increasing reflectivity of installed materials, where feasible and appropriate.

Stormwater will be managed throughout construction, as well as the life of the project. During construction, the site design will include a National Pollution Discharge Elimination System (NPDES) approved erosion and sediment control plan. Additional Best Management Practices will minimize both run-off and possible wind erosion. Once completed, the site will retain and infiltrate all stormwater from a design storm, per city of Boston requirements.

Vehicular parking will be provided on-site, but will not exceed the Boston zoning requirements.

4.4.4 *Water Efficiency*

The Water Efficiency (WE) category addresses environmental degradation related to overuse of potable water within residential buildings and irrigation systems.

The site will utilize efficient irrigation methodology to ensure minimal water waste. Plants will be native and non-invasive, zoned according to watering needs, and classified as drought-tolerant where feasible; spray heads will be efficient and only installed as needed, no hardscape or building foundations will be watered, and drip irrigation will be used in the majority of planting beds.

Residential units in the Project will utilize high-efficiency, low-flow fixtures for water closets, lavatory faucets, showers, and kitchen faucets.

4.4.5 *Energy and Atmosphere*

The Energy and Atmosphere (EA) category addresses ongoing energy usage and continued building performance. At a minimum, the Project will meet the Massachusetts's Stretch Energy Code, providing a 10% reduction in energy usage annually over ASHRAE 90.1-2013. The Project will also utilize high-efficiency heating and cooling equipment and will include an effective thermal barrier at the exterior envelope, reducing thermal losses to the exterior.

All installed systems will be commissioned prior to building occupancy, according to LEED Fundamental Commissioning requirements and ASHRAE Guideline 0: Commissioning Process for Buildings and Systems.

Occupants will be provided with a green guide to assure that green living strategies are used. Each unit will be metered separately in addition to the central master meter that will report the total building consumption.

4.4.6 *Materials and Resources*

The Materials and Resources (MR) category addresses all installed materials, including framing and interior finishes, as well as diversion of waste from landfills.

The project will meet the requirements of the Energy Star for Homes version 3, water management system builder checklist as appropriate including implementation of all moisture control measures listed in the LEED manual.

Where available, the Project will utilize panelized construction methodology-minimizing construction time and conditions variation. This will result in an efficient and effective exterior building envelope.

The Project will also utilize non-tropical wood products or Forestry Stewardship Council certification for necessary wood from tropical countries. Additionally, wood materials will be reviewed for reduction in added urea-formaldehyde resins.

All finish materials will be chosen for environmental benefits such as regionally sourced, low-Volatile Organic Compound (VOC) release, and green certifications for health benefits. Concrete mixture: aggregate materials will be sourced within 100-miles of the project site; paints, primers, adhesives, sealants will comply with the South Coast Air Quality Management District Rule #1113 and #1168; and, all flooring materials will include Green Label Plus certification (rugs) or FloorScore certification (resilient flooring), as applicable.

During demolition and construction on-site, all waste produced will be tracked to maximize diversion from landfills. The project will seek to achieve a minimum diversion rate of 50% during demolition and 75% during construction.

4.4.7 *Indoor Environmental Quality*

The Indoor Environmental Quality (EQ) category addresses the exhaust and ventilation of all interior spaces within the building, ensuring a consistent healthy environment for building residents. The Project will design all residential areas to meet the ASHRAE 62.2-2013 ventilation standard and all common spaces areas to meet the ASHRAE 62.1-2013 ventilation standard. All ductwork will be designed in accordance with the ACCA Manual J Heating and Cooling Loads, and Manual D Duct Sizing standards.

All installed combustion equipment will be directly vented to the exterior; and, each floor of each unit, as well as all common spaces, will be equipped with combination smoke and carbon dioxide detectors.

All installed mechanical equipment will include minimum MERV 8 filtration media to ensure that harmful particulates are filtered out of the air stream, prior to entry into the interior spaces. The building will be completely smoke free, further improving the indoor air quality and overall health of the residents.

During construction, all installed ductwork will be protected from contamination, starting at delivery on-site and continuing until final cleaning and occupancy.

Finally, each residential unit will be sealed for compartmentalization, per the Energy Star Multifamily High Rise Program Testing and Verification Protocols with an allowable maximum leakage rate of 0.23 cfm50 per square foot of enclosure.

4.4.8 *Innovation*

The Innovation (IN) category ensures that as sustainable design strategies and measures are evolving and improving and as new technologies are introduced to the market place, LEED provides a way for the project to take advantage of opportunities that may not be codified in the LEED system. As practical, the Project will review opportunities for incorporating innovative technologies in the design and construction.

4.4.9 *Climate Change Preparedness and Resiliency*

As required by the BRA for all Large Project Review projects, the project team has considered anticipated changes in climate by completing the BRA Climate Change

Resiliency and Preparedness Checklist, which is provided in Appendix 2 of this EPNF. Climate change is expected to result in rising sea levels, more frequent extreme storms, and more extreme weather events. The following sections describe what has been considered as it relates to climate change impacts as part of the early stages of project design.

4.4.10 *Addressing Anticipated Sea Level Rise and Flooding*

Rising sea levels and more frequent extreme storms as a potential result of climate change increase the probability of coastal and riverine flooding and enlarging of the 100 Year flood plain. As stated previously, the Project Site is not located in a special flood hazard area, floodway area, or other flood area. The Project area is not within 500-year flood zone. While sea level rise and extreme flooding is not expected to impact the Project, the Project's stormwater management system will provide for on-site infiltration, which will help accommodate heavy rain events.

4.4.11 *Addressing Extreme Weather and Heat Events*

Climate change is expected to result in more extreme weather events, including higher year-round average temperatures, higher peak temperatures, and more periods of extended peak temperatures.

To minimize the Project's susceptibility to drought, the landscape design is anticipated to incorporate regionally appropriate robust native and adaptive vegetation that will require minimal irrigation. The Project will also incorporate low-flow fixtures to conserve potable water.

To minimize the Project's impact on climate change, the Project's energy performance is anticipated to be 10 percent more efficient at minimum, in compliance with the current Stretch Energy Code, which will help reduce GHG emissions associated with building energy sources that contribute to global warming.

5.0 ENVIRONMENTAL PROTECTION

5.1 Intro

This section focuses on how the proposed Project will impact the surrounding environment. This review focuses on potential environmental impacts and how the Project will mitigate and manage those impacts. The following is a list of environmental areas of concern:

- Wind
- Shadow
- Daylight
- Solar Glare
- Air Quality
- Noise
- Flood Zones
- Water Quality
- Geotechnical
- Sold and Hazardous Waste
- Construction Impacts / Construction Management Plan

5.2 Wind

5.2.1 *Introduction*

A qualitative wind study was performed to assess the potential pedestrian wind conditions for the proposed 78 Braintree Street Project (the "Project"). The project consists of 261 residential rental units in three buildings that will be six stories tall. The project also includes a five-story parking garage. The objective of this assessment is therefore to provide a qualitative evaluation of wind comfort conditions and recommend mitigation measures, if necessary.

This qualitative assessment is based on the following:

- A review of regional long-term meteorological data;
- Preliminary building design drawings, and
- Our engineering judgment and knowledge of wind flow patterns.

This qualitative approach provides a screening-level estimation of potential wind conditions.

5.2.2 *Project Layout*

As shown in **Appendix 5-A**, Figure 1, the Project is located on the south side of Braintree Street in Allston, MA. It is a U-shaped site that surrounds the existing and future buildings at 20 and 30 Penniman Street, respectively. Both buildings are not part of the Project. Building A is six-story residential building on the south side of the site. Building B is also a six-story residential building on the east side of the site and Building C is a six-story residential building that is located on the northeast corner of the site. A five-story parking garage is adjacent to Building C on the northwest corner of the site on Penniman Street. These buildings shelter the interior part of the site from the prevailing northwest winds in the winter, east winds in the spring and southwest winds in the summer. Surroundings in the remaining directions are low residential and commercial buildings.

5.2.3 *Meteorological Wind Conditions*

The most recent five years of wind direction and speed data measured at Boston-Logan International Airport between 2012 and 2016 were analyzed for the spring (March to May), summer (June to August), fall (September to November) and winter (December to February) seasons. **Appendix 5-A**, Figure 2 graphically depict the distributions of wind frequency and directionality for these four seasons and for the annual period. The predominant wind directions are from the northwest and southwest. The northeasterly winds are also frequent, especially in the spring. Strong winds with mean speeds greater than 10 meters per second (22 mph) (red bands) measured at the airport are prevalently from the northwesterly directions throughout the year, while the southwesterly and northeasterly winds are also frequent. Therefore, winds from the northwest, southwest and northeast directions are considered most relevant for this qualitative analysis, while winds from other directions are also considered in this analysis.

5.2.4 *BPDA Wind Criteria*

The BPDA wind comfort criteria include two standards for assessing the relative wind comfort of pedestrians. The first criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root mean square wind speed) of 31 mph should not be exceeded more than one percent of the time. The second set of criteria used by the BPDA to determine the acceptability of specific locations. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of point of reference for the 1-hour mean wind speed exceeded 1% of the time (i.e., the 99-percentile mean wind speed) are presented in Table 5.2-1.

Table 5-1: BPDA Wind Comfort Criteria

Criteria Description	Wind Speed (mph)
Dangerous	>27
Uncomfortable for Walking	>19 and ≤ 27
Comfortable for Walking	>15 and ≤ 19
Comfortable for Standing	>12 and ≤ 15
Comfortable for Sitting	<12

Pedestrians on sidewalks will be active and wind speeds comfortable for walking are appropriate. Lower wind speeds comfortable for standing are desired for building main entrances where people tend to remain. For outdoor terraces, low wind speeds comfortable for sitting are desired during the summer. In other seasons, wind conditions in these areas may not be of a serious concern due to limited usage.

5.2.5 *Potential Wind Conditions*

As discussed in Section 5.2.3, winds are mostly from the northwest, southwest and northeast directions (**Appendix 5-A**, Figure 2). Winds from the northwest will generally be reduced by parking garage and Building C. Winds from the Southwest will generally be reduced by Building A with some funneling of the wind between Building A and 30 Penniman Street. Northeast winds will typically be reduced by

Building C. The Project will include a line of trees along the perimeter of the site, which will help to reduce wind conditions at the pedestrian level. **Appendix 5-A**, Figure 3 shows the general wind flow patterns for the Project site.

Vertical wind flows can also cause increased wind conditions at the ground due to "downwash effect" which could impact the court yard areas between Project buildings and the Penniman Street buildings.

Building Passageways and Entrances

The local wind climate and, existing surroundings and passageway orientation, it we expected the wind conditions within the passageway between buildings are generally comfortable for walking, with the potential for uncomfortable conditions at building corners during the winter and spring seasons. Lower wind conditions are likely for the Project site in the summer, but it may not be comfortable for sitting, especially around the exposed building corners.

Since the buildings are only 6 stories in height, the wind criterion are anticipated to be met. The main entrance to Buildings A and B faces east and the main entrance to Building C faces north. They are largely sheltered by each building from the prevailing northwest and northeast winds, and designed with large vestibules where patrons can wait indoor on windy and cold days.

As a result, suitable wind conditions are predicted around these entrances throughout the year. Trees are planned at each of the corners of the entrances of the buildings that will lower wind conditions.

Sidewalks

Pedestrians using the sidewalks are typically active in this area. Wind speeds for comfortable walking is expected to be met on all sidewalks. Periodic wind gusts may occur around building corners. The resultant wind conditions may be uncomfortable during the winter and spring seasons near Building C. (As discussed above, coniferous or deciduous trees will be planted along the perimeter of the site, which will reduce the wind conditions.) Trees that keep their leaves reasonably well in the winter and spring will absorb wind energy throughout the year.

5.2.6 *Conclusions*

A qualitative wind study was performed to assess the potential pedestrian wind conditions for the Project. The results of the study predict that there will be

suitable wind conditions for pedestrians using adjacent sidewalks and accessing the main entrances to the buildings. Increased wind conditions may increase around exposed building corners. This condition will be mitigated by the introduction of continuous rows of street trees along the project frontage.

5.3 Shadow

A shadow analysis was conducted for the Project to ensure that the proposed new buildings would not create adverse shadow impacts. Table 5-1 identifies the dates and times for which shadow conditions have been simulated.

Table 5-2: Shadow Study Dates and Times

Date	Time
Vernal Equinox – March 21st	9:00 AM, 12:00 noon, 3:00 PM
Summer Solstice – June 21st	9:00 AM, 12:00 noon, 3:00 PM
Autumnal Equinox – September 21st, EDT	9:00 AM, 12:00 noon, 3:00 PM
Winter Solstice – December 21st, EST	9:00 AM, 12:00 noon, 3:00 PM

The study presents both the existing conditions and the proposed conditions. The following is in reference to the shadow study images shown in Figures 5-1 through 5-6.

Figure 5-1: Shadow Studies, June 21st – Existing Context

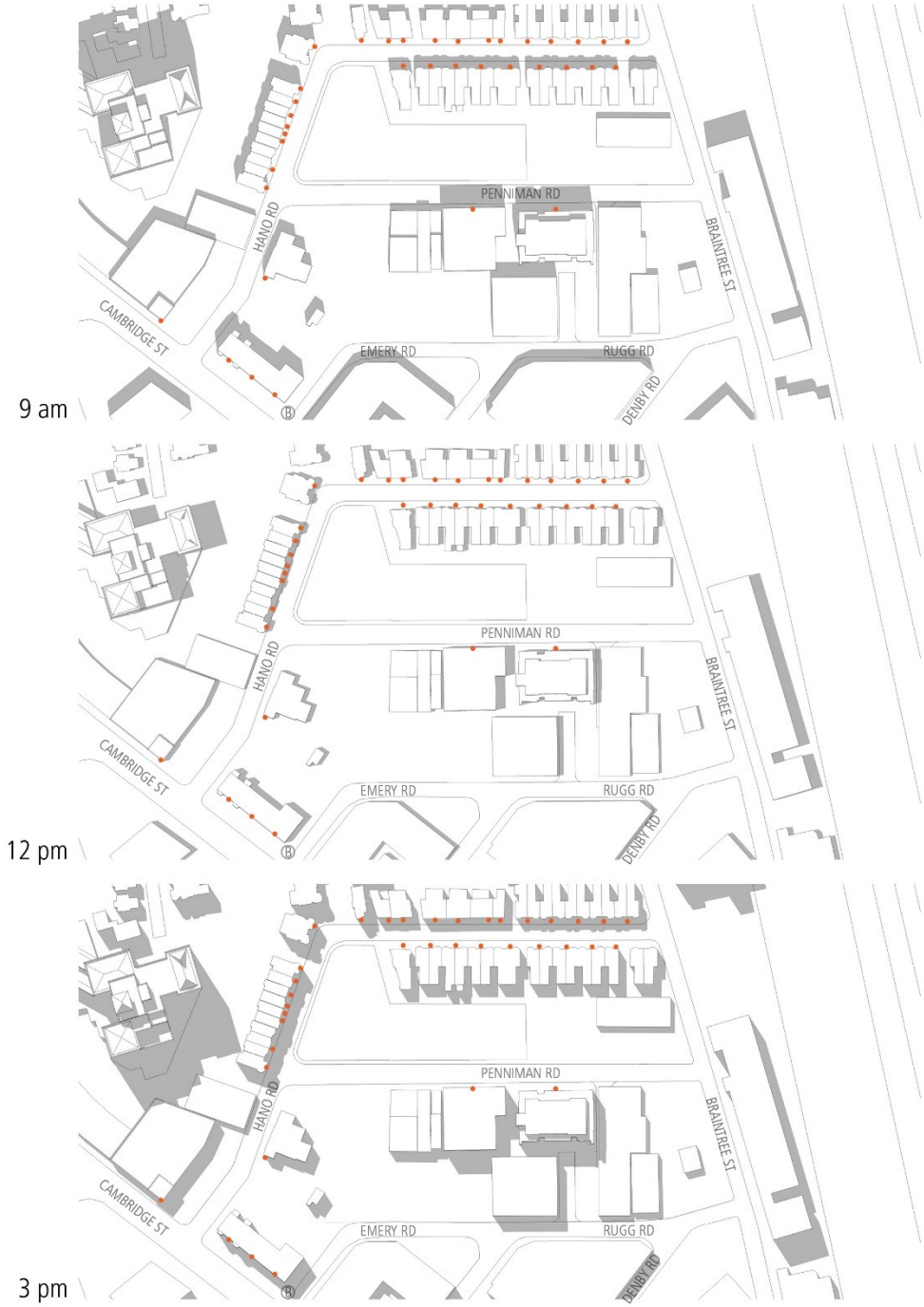


Figure 5-2: Shadow Studies, June 21st – New Proposal

Figure 5-3: Shadow Studies, September/March 21st – Existing Context

Figure 5-4: Shadow Studies, September/March 21st – New Proposal

Figure 5-5: Shadow Studies, December 21st – Existing Context

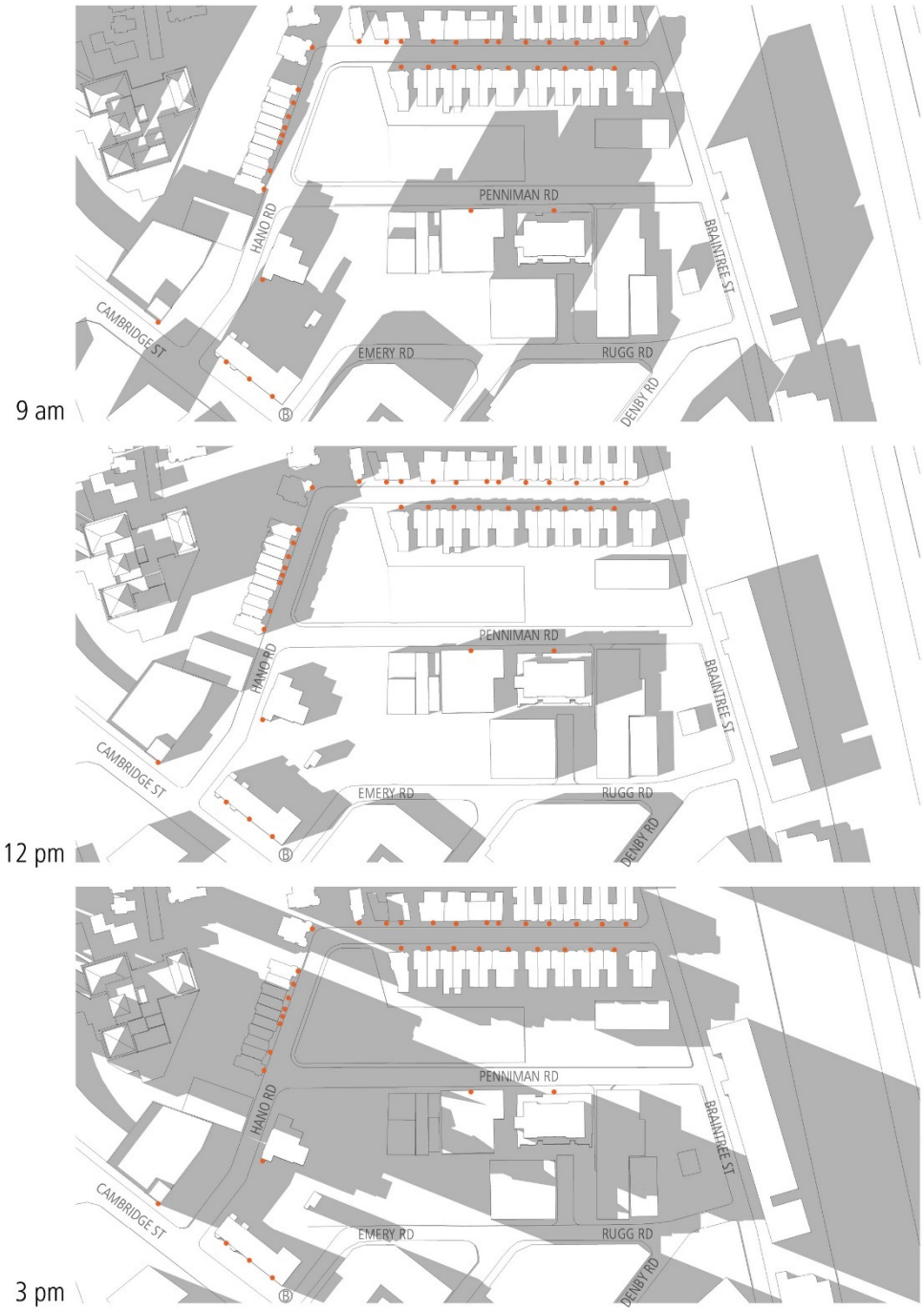
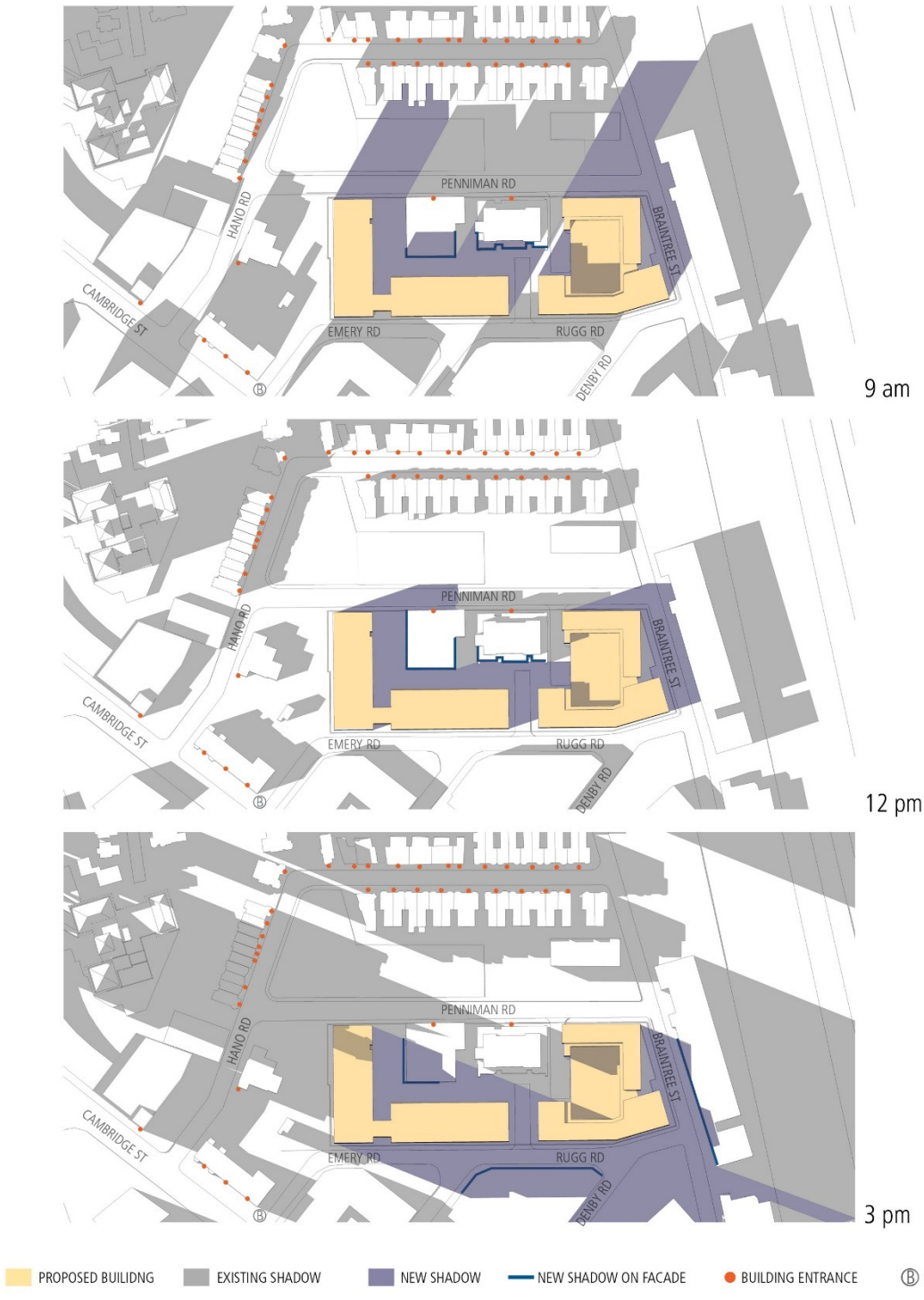


Figure 5-6: Shadow Studies, December 21st – New Proposal



5.4 Daylight Analysis

This section describes the daylight coverage analysis at the Project Site based on a comparison of existing and proposed conditions. The analysis is a requirement of the Article 80 Large Project Review (Section 80B-2(c) of the City of Boston Zoning Code). The daylight analysis was prepared using the BRA's Daylight Analysis Program (BRADA) and the architectural plans for the proposed Project.

5.4.1 *Summary*

The analysis was completed at five locations along the perimeter of the site on Rugg Road, Braintree Street and Penniman Road. At each location, there will be an increase in "skyplane" obstruction under the Build Condition. The results were expected and cannot be avoided when replacing parking lots and small buildings with larger buildings.

The building heights and massing of the proposed Project are consistent with the area master plan. As well as the other projects under construction in the neighborhood. The results of the analysis are presented in Figures 5-7 through 5-13.

5.4.2 *Analysis*

The analysis was completed using the BRADA software provided by the BPDA, which was developed in 1985 by the Massachusetts Institute of Technology to evaluate the effects of building massing and materials on pedestrians on the public right of way. The analysis includes a calculation of the percentage of the skyplane that is obstructed for the existing and proposed conditions. The output of the model includes a numerical percentage of the daylight blockage, a block drawing of the faces that are modelled and a graphic that visually represents the obstructed skyplane.

The modelling is based on plans and elevations from DiMella Shaffer. Based on a discussion with the BPDA, the model was set up with non-reflective building materials, which simplifies the models and is more conservative.

The following views were analyzed and are shown in Figures "Existing Daylight Analysis Views" and "Proposed Daylight Analysis Views":

- View 1 – Braintree Street – Existing Condition – Existing Building
- View 2 – Rugg Road – Existing Condition – Existing Building

- View 3 – Rugg Road – Existing Building
- View 4 – Penniman Road – Existing Building
- View 5 – Penniman Road – Existing Building
- View 6 – Braintree Street – Proposed Building C
- View 7 – Rugg Road – Proposed Building C
- View 8 – Rugg Road – Proposed Building B
- View 9 – Penniman Road – Proposed Building A
- View 10 – Penniman Road – Proposed Building C

5.4.3 *Existing Condition*

The site is approximately 1.89 acres occupied by four existing buildings ranging between one and two stories, including associated parking areas with very little structure to obstruct the skyplane.

View 1 represents the area along Braintree Street with an existing one-story building and 1.5-story building in the background. The resulting skyplane blockage is 8.4%.

View 2 represents the area along the north end of Rugg Road with an existing one-story building and 1.5istory building. The resulting skyplane blockage is 24.1%.

View 3 represents the area along the south end of Rugg Road with an existing two-story building and one-story building in the background. The resulting skyplane blockage is 6.8%.

View 4 represents the area along the south end of Penniman Road with an existing one-story building. The resulting skyplane blockage is 14.5%.

View 5 represents the area along the north end of Penniman Road with an existing 1.5-story building and one-story building. The resulting skyplane blockage is 9.9%.

5.4.4 *Proposed Condition*

The proposed condition consists of two six-story buildings and associated green space. The proposed modelling includes five views of the site from the Braintree Street, Rugg Road and Penniman Road.

View 6 represents the area along Braintree Street with the proposed six-story Building C. The resulting skyplane blockage is 69.5%.

View 7 represents the area along the north end of Rugg Road with the proposed six-story Building C. The resulting skyplane blockage is 69.8%.

View 8 represents the area along the south end of Rugg Road with the proposed six-story Building B. The resulting skyplane blockage is 71.2%.

View 9 represents the area along the south end of Penniman Road with the proposed six-story Building A. The resulting skyplane blockage is 50.3%.

View 10 represents the area along the north end of Penniman Road with the proposed six-story Building C. The resulting skyplane blockage is 67.2%.

5.4.5 *Conclusion*

As previously stated, constructing a building where smaller buildings or no buildings exist will increase the skyplane blockage, which is the case in each of the studied views above. The project minimizes the skyplane blockage by maintaining building heights at 6 stories or 70 feet where the master plan calls for up to 12 stories or 110 feet.

In conclusion, the proposed project is similar in size and scale to the other projects in the neighborhood, as well as some of the existing buildings in the area which range from 4-7 stories, and will therefore have similar skyplane obstructions. The project has mitigated the impacts by proposing building heights of 6 stories (roughly 70 feet) where the area master plan calls for heights of up to 12 stories (110 feet). Additionally, the daylight impacts will be further reduced when factoring in this project's, as well as the adjacent projects', building materials and glazing, which will provide a level of reflectance and improve the overall daylight experience.

Figure 5-7: Existing BRADA Views

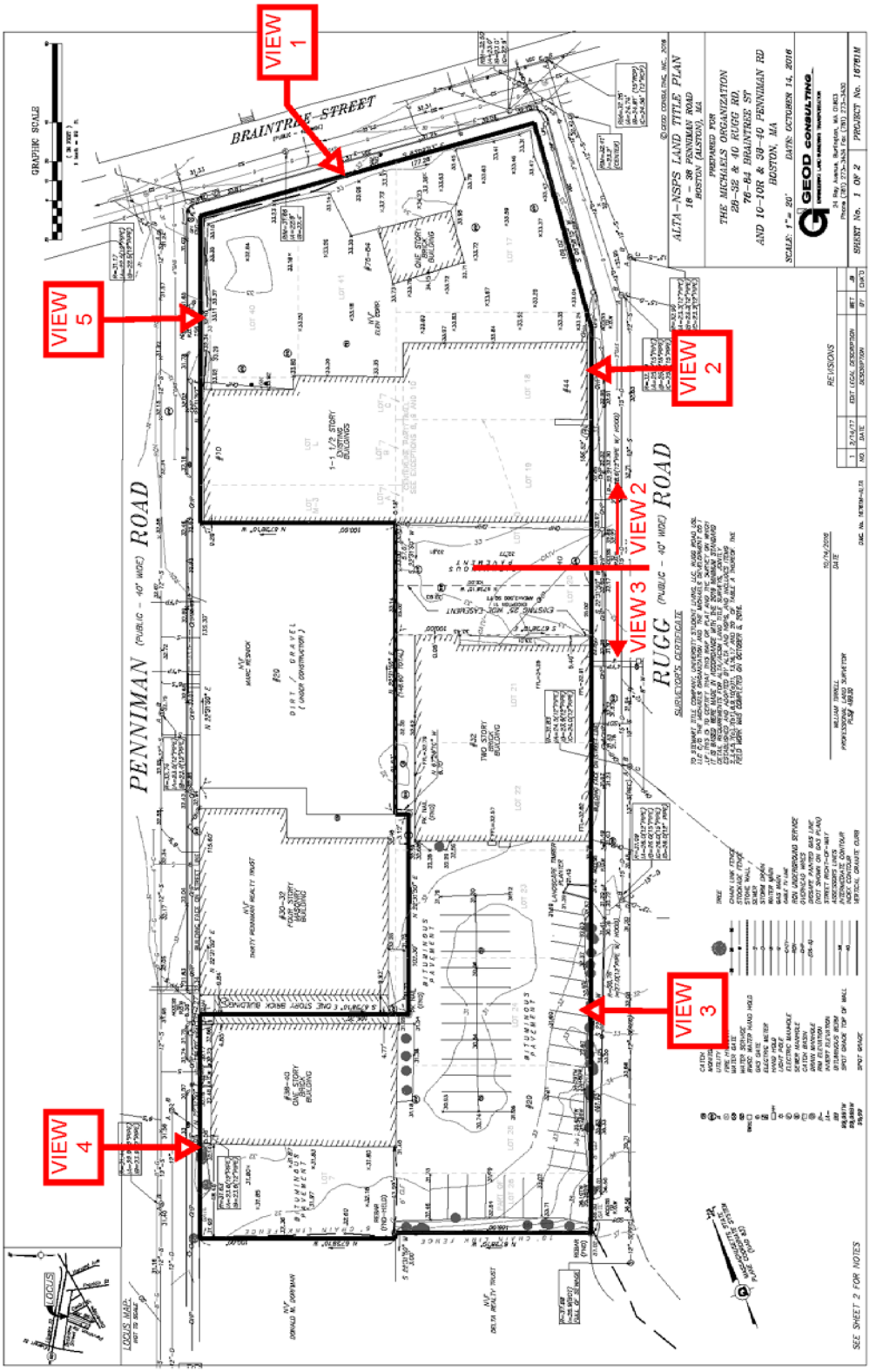
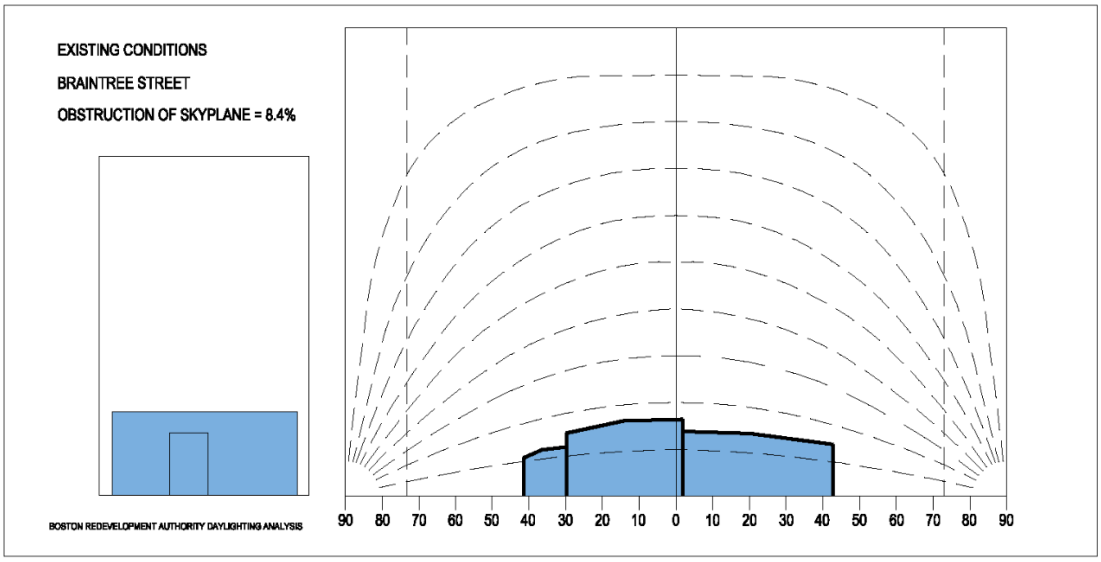
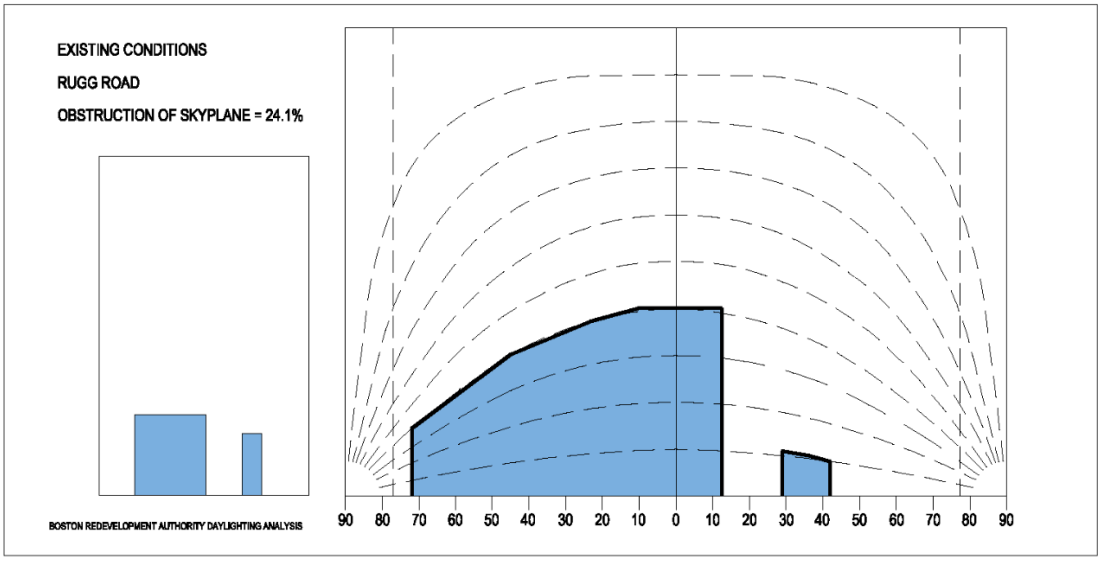


Figure 5-8: Existing Conditions View 1 and View 2

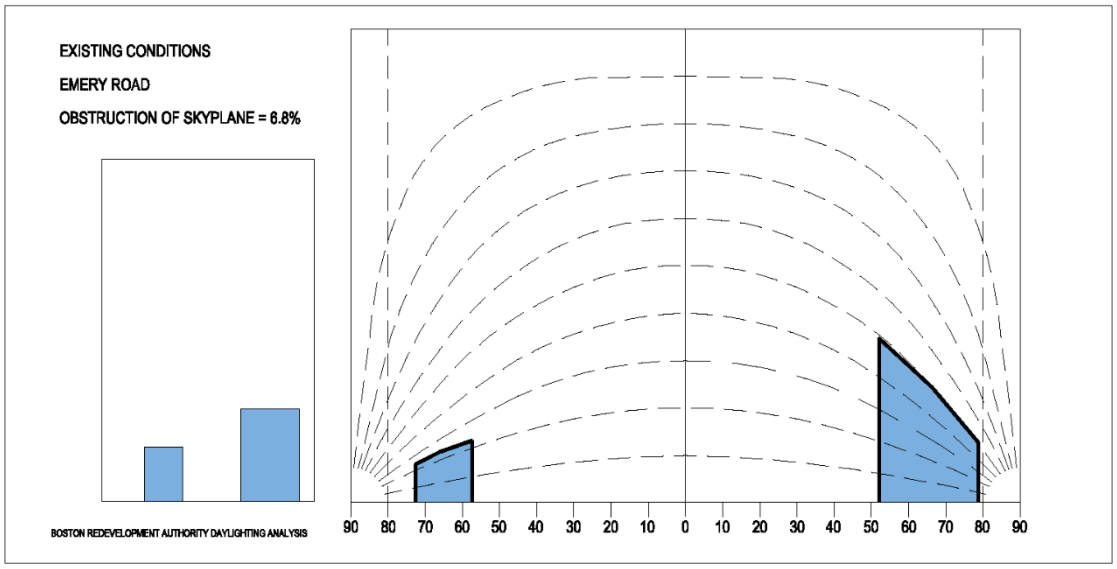


VIEW 1

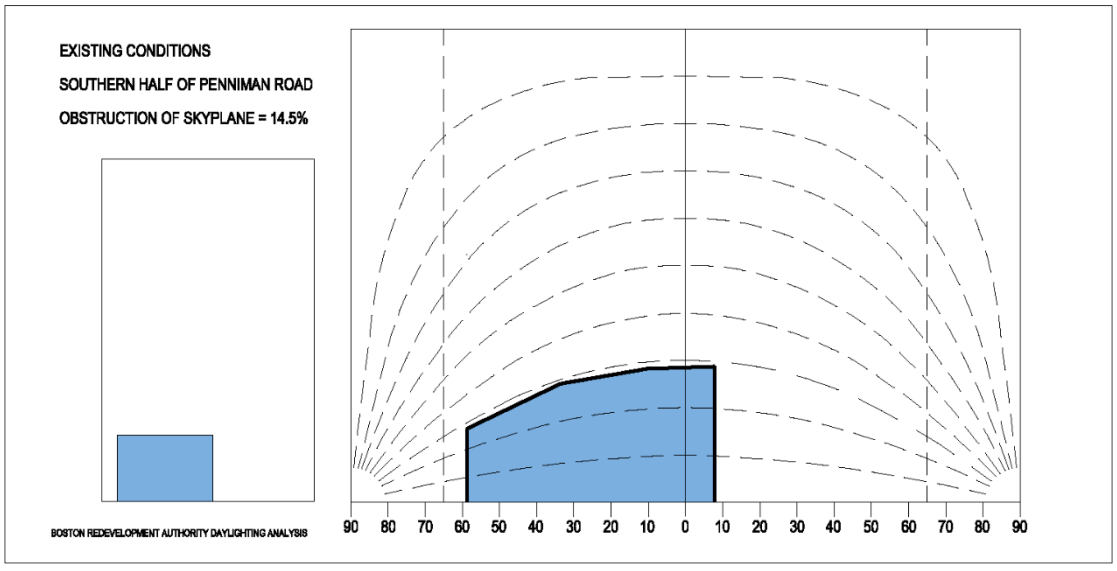


VIEW 2

Figure 5-9: Existing Conditions View 3 and View 4

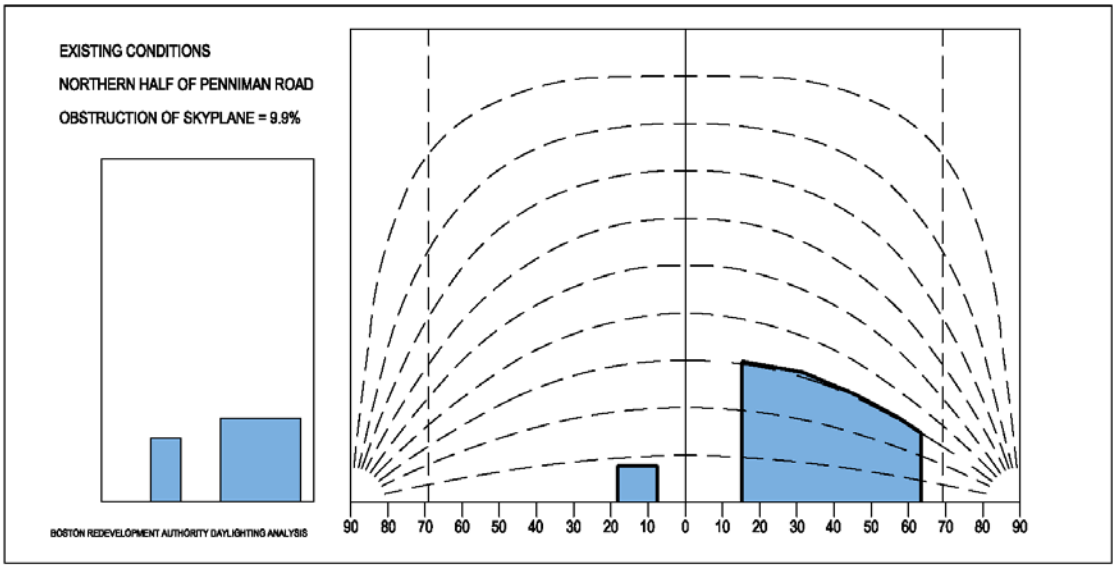


VIEW 3

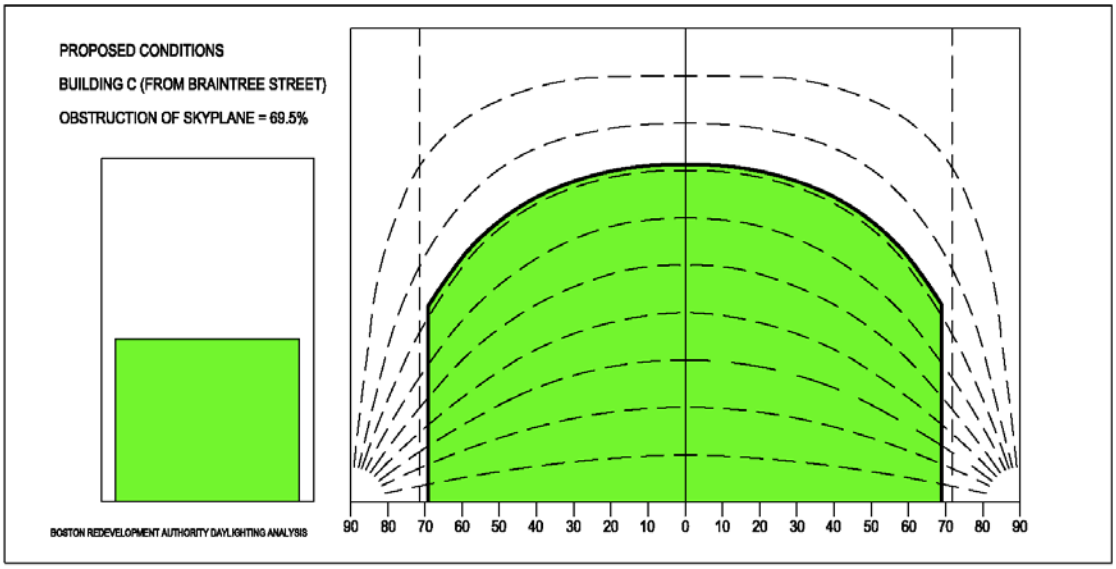


VIEW 4

Figure 5-10: Existing Conditions View 5 and Proposed Conditions View 6



VIEW 5



VIEW 6

Figure 5-11: Proposed BRADA Views

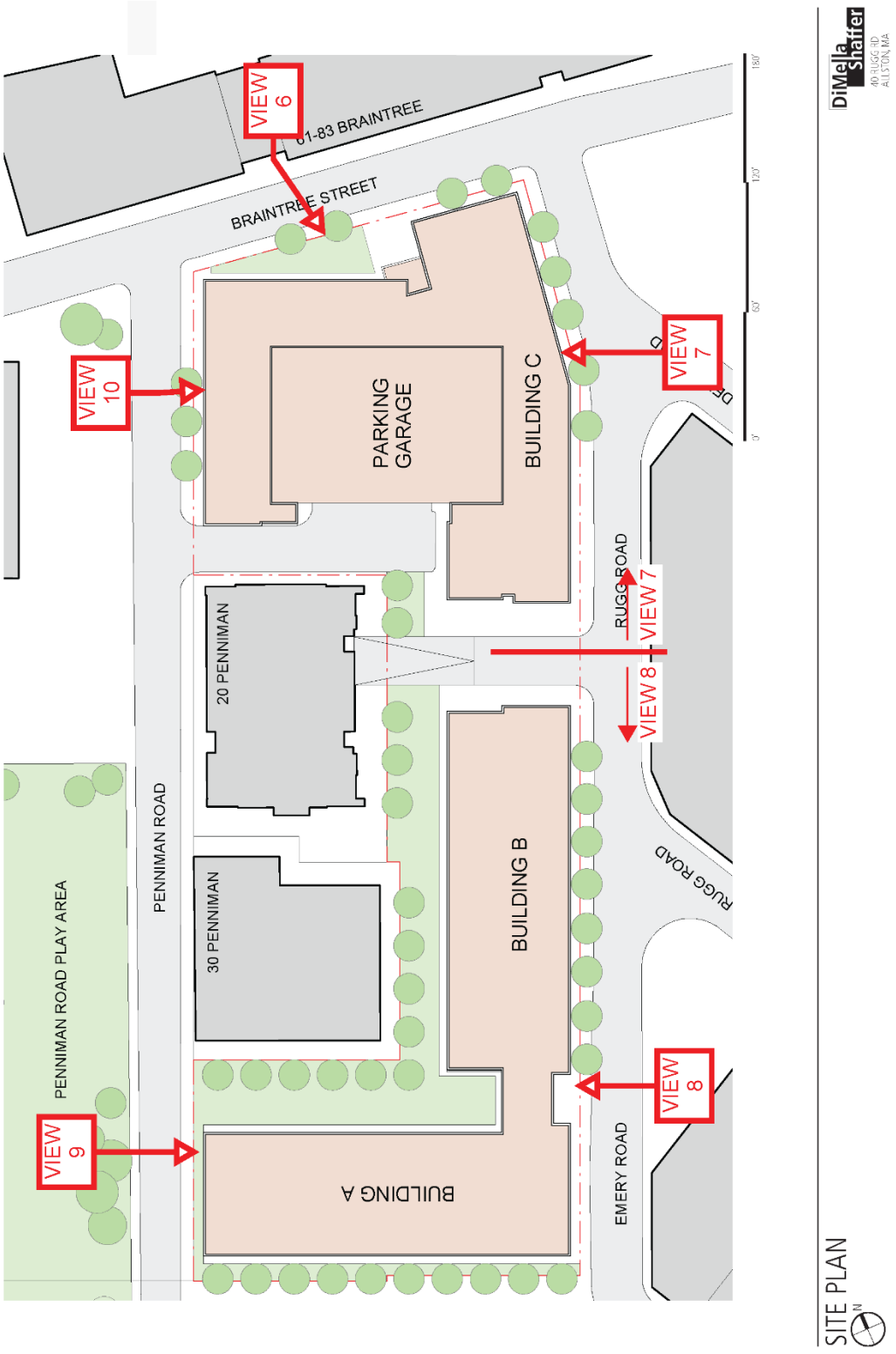
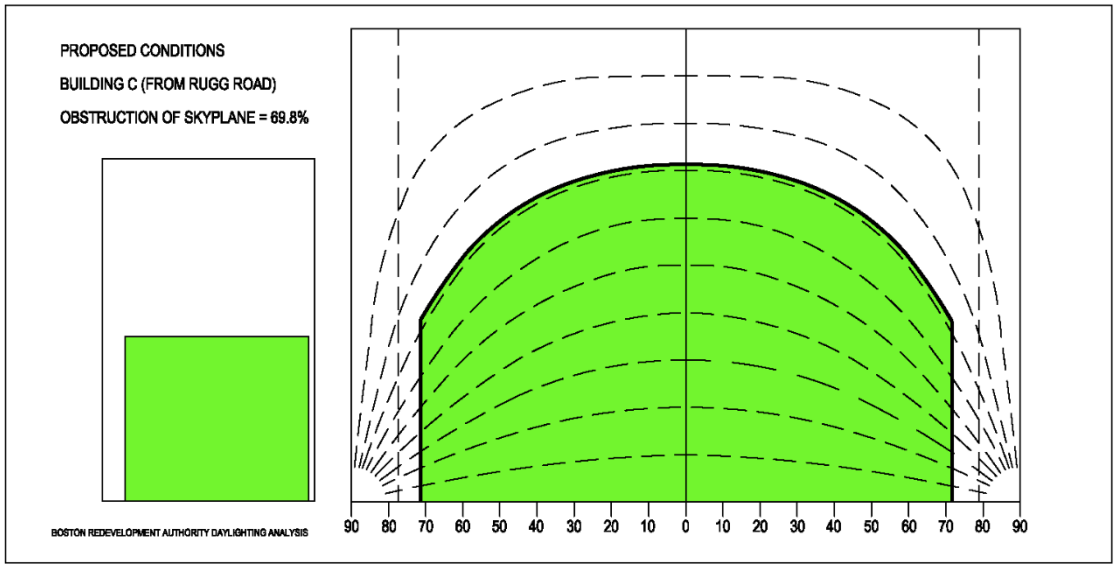
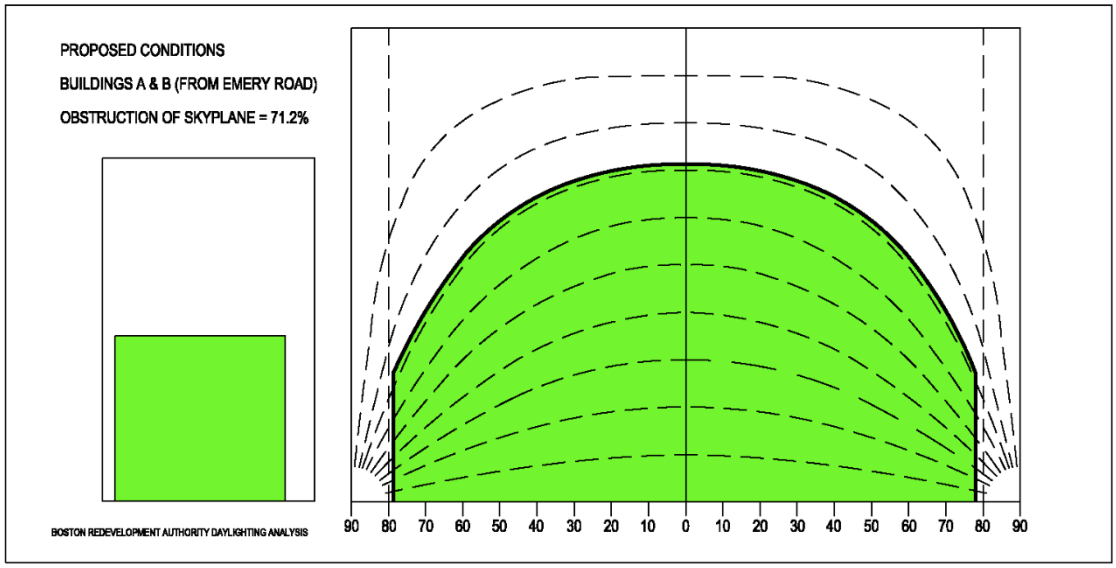


Figure 5-12: Proposed Conditions View 7 and View 8

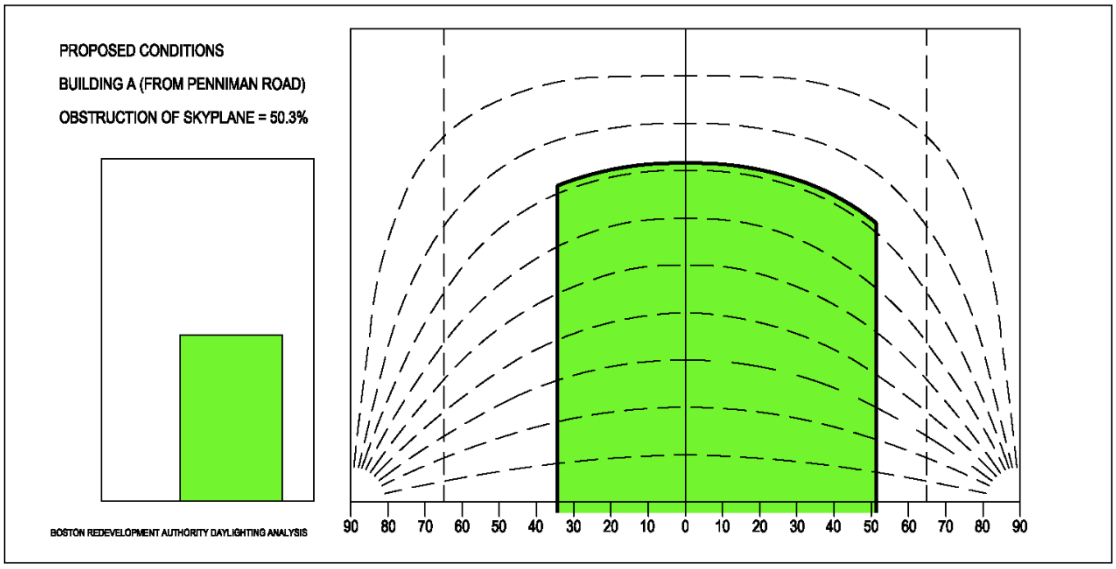


VIEW 7

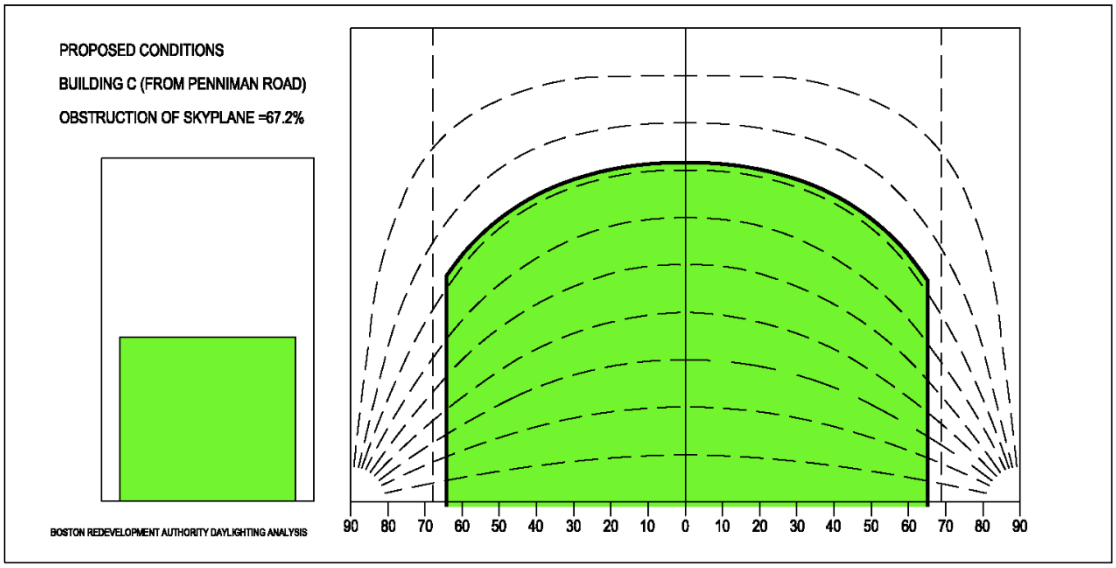


VIEW 8

Figure 5-13: Proposed Conditions View 9 and View 10



VIEW 9



VIEW 10

5.5 Solar Glare

Buildings with the Project Site will utilize high-performance materials and facades that are cognizant of the necessary balance of visual aesthetics, thermal performance, cost, heat gain and construction efficiency. The Project will comply with Article 37 of the Boston Zoning Code and will be "LEED Certifiable" per LEED Residential Mid-rises definitions. As such, all of the Project's building structures will incorporate significant efficiencies related to energy conservation into their design.

Further, the Proponent does not believe that there will be any solar glare issues resulting from material and façade choices. Glazing performance will balance the metrics of visible light transmittance, thermal insulation value and solar heat gain. Highly mirrored finishes or glazing with a high degree or reflectivity will not be used within the Project Site.

5.6 Air Quality

5.6.1 *Introduction*

Air quality analyses were performed for the proposed. The project consists of 261 residential rental units in three buildings that will be six stories tall. There will also be a small retail and amenity services component of approximately 2,700 sf as part of the project. The project also includes a five-story parking garage. These analyses consisted of: 1) an evaluation of existing air quality; 2) an evaluation of potential carbon monoxide (CO) impacts from the operation of the Project's fuel combustion and parking garage, and 3) a microscale CO analysis for intersections in the Project area that meet the BPDA criteria for requiring such an analysis.

5.6.2 *Background Concentrations*

The City of Boston is currently classified as being in attainment of the Massachusetts and National Ambient Air Quality Standards ("NAAQS") for all of the criteria air pollutants except ozone (see **Table 5.6-1**). These air quality standards have been established to protect the public health and welfare in ambient air, with a margin for safety.

The Massachusetts Department of Environmental Protection (MassDEP) currently operates air monitors in various locations throughout the city. The closest, most representative, MassDEP monitors for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), fine particulate matter ($PM_{2.5}$), coarse particulate matter (PM_{10}), and lead are located at Dudley Square on Harrison Avenue, Boston, MA.

Table 5.6-2 summarizes the MassDEP air monitoring data, for the most recent available, complete, three-year period (2013-2015), that are considered to be representative of the project area. **Table 5.6-2** shows that the existing air quality in the Project area is generally much better than the NAAQS. The highest impacts relative to a NAAQS are for ozone and $PM_{2.5}$. Ozone is a regional air pollutant on which the small amount of additional traffic generated by this Project will have an insignificant impact. The Project's operations will not have a significant impact on local $PM_{2.5}$ concentrations.

5.6.3 *Air Quality Modeling Methodology and Results*

Air quality dispersion modeling analyses consisted of: 1) an evaluation of potential carbon monoxide (CO) impacts from the operation of the Project's fuel combustion and parking garage, and 2) a microscale CO analysis for intersections in the Project area that meet the BPDA criteria for requiring such an analysis. Emissions calculations and modeling approach for both air dispersion modeling analyses are presented below.

Table 5-3: Massachusetts and National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	NAAQS (µg/m3)
Sulfur Dioxide (SO_2)	1-hour[P] 3-hour[S] Annual[P] (Arithmetic Mean)	196[a] 1,300[b] 80
Carbon Monoxide (CO)	1-hour[P] 8-hour[P]	40,000[b] 10,000[b]
Nitrogen Dioxide (NO_2)	1-hour[P] Annual[P/S] (Arithmetic Mean)	188[c] 100
Coarse Particulate Matter (PM_{10})	24-hour[P/S]	150
Fine Particulate Matter ($PM_{2.5}$)	24-hour[P/S] Annual[P] (Arithmetic Mean) Annual[S] (Arithmetic Mean)	35[d] 12[e,f] 15

Ozone ($O_{3)}$	8-hour[P/S]	137[g]
Lead (Pb)	Rolling 3-Month Avg.[P/S]	0.15

P = primary standard; S = secondary standard.

[a] 99th percentile 1-hour concentrations in a year (average over three years).

[b] One exceedance per year is allowed.

[c] 98th percentile 1-hour concentrations in a year (average over three years).

[d] 98th percentile 24-hour concentrations in a year (average over three years).

[e] Three-year average of annual arithmetic means.

[f] As of March 18, 2013, the U.S. EPA lowered the $PM_{2.5}$ annual standard from 15 ug/m^3 to 12 ug/m^3.

[g] Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m^3) (effective December 28, 2015); the annual PM_{10} standard was revoked in 2006.

Table 5-4: Representative Existing Air Quality in the Project Area

Pollutant, Averaging Period	Monitor Location	Value (□g/m^3)	NAAQS (□g/m^3)	Percent of NAAQS
CO, 1-hour	Kenmore Square & Harrison Avenue, Boston	1,559 (1.4 ppm)	40,000	4%
CO, 8-hour	Kenmore Square & Harrison Avenue, Boston	1,031 (0.9 ppm)	10,000	1%
NO_2, 1-hour	Kenmore Square, Boston	95.9	188	51%
NO_2, Annual	Kenmore Square, Boston	33.4	100	33%
Ozone, 8-hour	Kenmore Square, Boston	110	137	80%
PM_{10}, 24-hour	Kenmore Square, Boston	53	150	35%
$PM_{2.5}$, 24-hour	Kenmore Square, Boston	15.7	35	45%
$PM_{2.5}$, Annual	Kenmore Square, Boston	6.8	12	57%
Lead, Quarterly	Harrison Avenue, Boston	0.016	0.15	11%
SO_2, 1-hour	Kenmore Square, Boston	23.7	196	12%

Source: MassDEP, http://www.mass.gov/dep/air/priorities/aqreports.htm., downloaded January 30, 2017.

Notes:

(1) Annual averages are highest measured during the most recent three-year period for which data are available (2014 - 2015). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.

(2) The eight-hour ozone value is the 3-year average of the annual fourth-highest values, the 24-hour $PM_{2.5}$ value is the 3-year average of the 98th percentile values, the annual PM2.5 value is the 3-year average of the annual values – these are the values used to determine compliance with the NAAQS for these air pollutants.

(3) The one-hour NO_2 value is the -year average of the 98th percentile values and the one-hour SO_2 value is the -year average of the 99th percentile values

(4) The one-hour ozone standard was revoked by the US EPA in 2005; the annual PM_{10} standard was revoked in 2006 and the 3-hour SO_2 standard was revoked by the US EPA in 2010.

5.6.3.1 Fuel Combustion Equipment and Parking Garage

The Project will include roof-top fuel combustion equipment that will emit air pollutants to the atmosphere when operating. Fuel combustion equipment for the Project will include gas-fired boilers. The objective of this analysis was to determine the maximum CO concentrations from fuel combustion equipment inside the garage and at the closest sensitive receptors surrounding the Project. These closest sensitive receptors include: air intakes located on the proposed buildings and nearby existing buildings, and pedestrians at ground level anywhere near the Project. CO emissions from motor vehicles operating inside the garage were calculated and the CO concentrations inside the garage and surrounding the Project were based on Saturday morning peak traffic periods. CO emissions from fuel combustion equipment and garage exhaust vents were modeled using an U.S. EPA-approved air model.

Worst-case concentrations of CO from the fuel combustion equipment and parking garage vent were predicted for locations around the building with using AERMOD model (Version 16216r) in screening-mode. The AERMOD model in screening-mode was used to predict the maximum concentration of CO by modeling the fuel combustion equipment and parking garage emissions as a volume using worst-case meteorological conditions for an urban area. The screening-mode option simulates modeling results predicted by AERSCREEN. The predicted concentrations presented here represent the worst-case air quality impacts from the fuel combustion equipment and garage at all locations on and around the Project. AERMOD predicted one-hour average concentrations of air pollutants.

Fuel Combustion Equipment

The Project will include fuel combustion equipment that will emit air pollutants to the atmosphere when operating. Fuel combustion equipment for the Project will include individual residential gas-fired boilers/hot water heaters (each with a heat input capacity of 0.15 million Btu per hour (MMBtu/hour).

EPA's AP-42 document was used to determine the uncontrolled CO emission rate for the gas-fired boilers. The gas-fired boiler heat input capacity for the project will be approximately 37.4 MMBtu/hour. Assuming a heating value of 1,020 Btu/cubic foot of natural gas this translates to approximately 36,620 cubic feet of natural gas burned per hour. Using a CO emission factor of 0.084 lb./MMBtu,[1] the maximum total CO emissions from the project will be 3.1 lbs./hour (0.39 gram/second). This calculation conservatively assumes that all of the gas-fired fuel combustion equipment is operating simultaneously at its full design capacity.

Parking Garage

The proposed parking garage will have a five-levels of parking require mechanical ventilation. The garage ventilation system will be designed to provide adequate dilution of the motor vehicle emissions before they are vented outside. The design of the garage ventilation system will meet all building code requirements. Full ventilation of the garage will require fans that will supply a maximum flow of approximately 52,800 cubic feet per minute (cfm) of fresh air. This quantity of air is designed to meet the building code and will be more than adequate to dilute the emissions inside the parking garage to safe levels before they are vented outside. The garage ventilation exhausts will likely be located at two vents at 10 feet above ground level.

The peak weekday morning and afternoon one-hour entering and exiting traffic volumes for the parking garage are shown in **Table 5.6-3**.

Table 5-5: Peak Hour Garage Traffic Volumes

Time Period	Entering (vehicles/hour)	Exiting (vehicles/hour)	Total (vehicles/hour)
Weekday Morning Peak hour	12	45	57
Weekday Afternoon Peak Hour	48	27	75

Source: Kittelson & Associates, Inc.

[1] US EPA, "Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition Volume I: Stationary Point and Area Sources", Table 1.4-1, January 1995 (revised July 1998).

The U.S. Environmental Protection Agency (EPA) MOVES2014 emission factor model was used to calculate single vehicle CO emissions rates, for a vehicle speed of 5 mph. The inputs to the MOVES2014 model followed the latest guidance from the MassDEP and were performed for the Existing year of 2017 consistent with the microscale air quality analysis. This represents the worst case, since the MOVES2014 model predicts decreasing CO emissions rates in future years due to more stringent emission control requirements for new motor vehicles. The CO emission rate calculated by MOVES2014, for a speed of 5 mph, was 2.976 grams per hour (gph) for each entering and exiting vehicle. These emission rates apply to wintertime conditions when motor vehicle CO emissions are greatest due to cold temperatures. MOVES2014 model output is provided in the **Appendix 5-B**.

To determine the maximum one-hour CO emissions inside the garage it was necessary to estimate the amount of time each motor vehicle will be in the parking garage with its engine running. To be conservative, it was assumed that every car entering the garage will travel to the farthest parking spot, and that the vehicles leaving the garage will have to travel the same distance from inside the garage to the exit. The calculations in **Appendix 5-B**. show how long each vehicle was calculated to travel in the garage for the weekday afternoon peak hour.

The peak one-hour CO emission rate for the parking garage was calculated to be 0.15 grams per minute (0.0025 grams/second) for the weekday afternoon peak hour. Applying the maximum volumetric garage ventilation flow rate for the parking garage, the peak one-hour CO concentration inside the garage was calculated to be 0.09 parts of CO per million parts of air (ppm) for the weekday afternoon peak hour. This prediction represents conservative estimates of the peak garage CO emissions and concentrations.

5.6.3.2 Stationary Sources Air Quality Results

The results of the air quality analysis for locations outside and around the buildings are summarized in **Table 5.6-4**. The results in **Table 5.6-4** represent all outside locations on and near the Project Site, including nearby building air intakes and nearby residences. **Appendix 5-B** contains the AERMOD model output.

AERMOD predicted that the maximum one-hour CO concentration from the fuel combustion equipment and parking garage exhaust vents will be 0.37 ppm (430.83 µg/m^3). This concentration represents the maximum CO concentration at any location surrounding the Project.

The maximum predicted eight-hour CO concentration at any ambient (outside) location will be significantly smaller than the one-hour prediction. This is because: 1) the average number of vehicles entering and exiting the garage over the peak eight-hour period will be significantly less than the peak one-hour values used to predict the peak one-hour CO impact, 2) all fuel combustion equipment is operating at their maximum load simultaneously, and 3) the worst-case meteorological conditions used to predict the peak one-hour impact will not persist for eight consecutive hours. AERSCREEN guidance allows the maximum eight-hour CO impact to be conservatively estimated by multiplying the maximum one-hour impact by a factor of 0.9 (i.e. the eight-hour impact is 90% of the one-hour impact). The maximum predicted eight-hour CO concentration was determined to be approximately 0.34 ppm (0.37 ppm x 0.9).

The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare in ambient air, with a margin for safety. The NAAQS for CO are 35 ppm for a one-hour average and 9 ppm for an eight-hour average. The Commonwealth of Massachusetts has established the same standards for CO. The CO background values of 1.9 ppm for a one-hour period and 1.1 ppm for an eight-hour period were added to the maximum predicted fuel combustion ambient impacts to represent the CO contribution from other, more distant, sources. With the background concentration added, the peak, total, one-hour and eight-hour CO impacts from the fuel combustion equipment, at any location around the building, will be no larger than 2.3 ppm and 1.4 ppm, respectively. These maximum predicted total CO concentrations (fuel combustion equipment and parking garage plus background) are safely in compliance with the NAAQS. This analysis demonstrates that the operation of the fuel combustion equipment will not have an adverse impact on air quality.

Table 5-6: Fuel Combustion Equipment and Parking Garage Air Quality Impacts

Location	Peak Predicted One-Hour Impact (ppm)	One-Hour NAAQS (ppm)	Peak Predicted Eight-Hour Impact (ppm)	Eight-Hour NAAQS (ppm)
Ambient Air Near Garage	2.3	35 (NAAQS)	1.4	9 (NAAQS)

NAAQS = Massachusetts and National Ambient Air Quality Standards for CO (ppm = parts per million)

* Representative of maximum CO impact at all nearby residences, buildings, and sidewalks.

5.6.3.3 Microscale CO Analysis for Selected Intersections

The Boston Planning & Development Authority (BPDA) typically require a microscale air quality analysis for any intersection in the Project study area where the level of service (LOS) is expected to deteriorate to D and the proposed project causes a 10% increase in traffic or where the level of service is E or F and the project contributes to a reduction in LOS. For such intersections, a microscale air quality analysis is required to examine the carbon monoxide (CO) concentrations at sensitive receptors near the intersection.

A microscale air quality analysis was not performed for this Project due to the Project trip generation having minimal impacts on the overall delays at the four intersections. The Project will generate approximately 58 motor vehicle trips during the morning peak traffic hour and approximately 75 motor vehicle trips during the afternoon traffic hour.

The overall LOS will be the same during the morning peak traffic hour for all intersections for the Existing, No-Build and Build scenarios. The overall LOS will be the same during the afternoon peak traffic hour for all intersections for the Existing, No-Build and Build scenarios, except for the Cambridge Street/Hano Street and the Cambridge Street/Denby Road intersections where the overall LOS degrades from C to D and A to C in the Build scenario, respectively. These degradations are due increases in future background traffic and project-related traffic at the Cambridge Street/Denby Road intersection. However, the increase in traffic at this intersection is less than 10% and the LOS is better than D.

Table 5.6-5 shows a comparison of the Existing (2017) and Build (2022) LOS at the four intersections. The motor vehicle trip generation from the Project will not have a significant impact on motor vehicle delays and air pollutant emissions at the analyzed intersections. Therefore, the motor vehicle traffic generated by the Project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project.

Table 5-7: Summary of Level of Service

Intersection	Existing LOS (AM/PM)	No Build LOS (AM/PM)	Build LOS (AM/PM)	Requires Analysis?
Cambridge Street/Hano Street – unsignalized	C/C	B/D	B/D	NO
Cambridge Street/Denby Road - signalized	A/A	A/B	A/C	NO
Penniman Road/Braintree Street- unsignalized	A/A	A/A	A/A	NO
Denby Road/Braintree Street- unsignalized	A/A	A/A	A/A	NO

The LOS shown represents the overall delay at each signalized intersection and the worst approach at the unsignalized intersection.

*Project does not contribute to reduction in level of service.

Source: Kittelson & Associates, Inc.

5.7 Noise

5.7.1 *Introduction*

Tech Environmental, Inc., performed a noise study to determine whether the operation of the proposed Project will comply with the City of Boston Noise Regulations, the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy and Housing and Urban Development (HUD) guideline.

5.7.2 *Noise Terminology*

The unit of sound pressure is the decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. A property of the decibel scale is that the sound pressure levels of two

separate sounds are not directly additive. For example, if a sound of 70 dB is added to another sound of 70 dB, the total is only a 3-decibel increase (or 73 dB), not a doubling to 140 dB. Thus, every 3 dB increase represents a doubling of sound energy. For broadband sounds, a 3 dB change is the minimum change perceptible to the human ear. Table 5.7-1 gives the perceived change in loudness of different changes in sound pressure levels.2

Table 5-8: Subjective Effects of Changes in Sound Pressure Levels

Change in Sound Level	Apparent Change in Loudness
3 dB	Just perceptible
5 dB	Noticeable
10 dB	Twice (or half) as loud

Non-steady noise exposure in a community is commonly expressed in terms of the A-weighted sound level (dBA); A-weighting approximates the frequency response of the human ear. Levels of many sounds change from moment to moment. Some are sharp impulses lasting 1 second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L90 metric, which is the sound level exceeded 90 percent of the time, is typically used. The L90 can also be thought of as the level representing the quietest 10 percent of any time period. Similarly, the L10 can also be thought of as the level representing the quietest 90 percent of any time period. The L10 and L90 are broadband sound pressure measures, i.e., they include sounds at all frequencies. The Leq, or equivalent sound level, is the steady-state sound level over a period of time that has the same acoustic energy as the fluctuating sounds that actually occurred during that same period. Federal noise guidelines are based on the Ldn, which is the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB imposed on the equivalent sound levels for night time hours of 10 p.m. to 7 am.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound

[2] American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1989 ASHRAE Handbook--Fundamentals (I-P) Edition, Atlanta, GA, 1989.

pressure waves, and typically the frequency analysis examines 10 octave bands from 32 Hz to 16,000 Hz.

The acoustic environment in an urban area such as the Project area results from numerous sources. Observations show that major contributors to the background sound level in the Project area include motor vehicle traffic on local and distant streets, aircraft over-flights, mechanical equipment on nearby buildings, and general city noises such as street sweepers and police/fire sirens. Typical sound levels associated with various activities and environments are presented in **Table 5.7-2.**

5.7.3 *Noise Regulations and Criteria*

Commonwealth Noise Policy

The MassDEP regulates noise through 310 CMR 7.00, "Air Pollution Control." In these regulations "air contaminant" is defined to include sound and a condition of "air pollution" includes the presence of an air contaminant in such concentration and duration as to "cause a nuisance" or "unreasonably interfere with the comfortable enjoyment of life and property."

Regulation 7.10 prohibits "unnecessary emissions" of noise. The MassDEP DAQC Policy Statement 90-001 (February 1, 1990) interprets a violation of this noise regulation to have occurred if the noise source causes either:

- An increase in the broadband sound pressure level of more than 10 dBA above the ambient level; or
- A "pure tone" condition.

The ambient background level is defined as the L_{90} level as measured during equipment operating hours. A "pure tone" condition occurs when any octave band sound pressure level exceeds both of the two adjacent octave band sound pressure levels by 3 dB or more.

The MassDEP does not regulate noise from motor vehicles accessing a site or the equipment backup notification alarms. Therefore, the provisions described above only apply to a portion of the sources that may generate sound following construction of the Project.

Local Regulations

The City of Boston Environment Department regulates noise through the Regulations for the Control of Noise as administered by the Air Pollution Control Commission. The Project is located in an area consisting of commercial and residential uses. The Project will have low-rise residential uses to the north, single family homes to the west, and to the south. The Project must comply with Regulation 2.2 for noise levels in Residential Zoning Districts at these residential locations. **Table 5.7-3** lists the maximum allowable octave band and broadband sound pressure levels for residential and business districts. Daytime is defined by the City of Boston Noise Regulations as occurring between the hours of 7:00 a.m. and 6:00 p.m. daily except Sunday. Compliance with the most restrictive nighttime residential limits will ensure compliance for other land uses with equal or higher noise limits.

HUD Site Acceptability Standards

Noise monitoring at the Project Site during the daytime and nighttime were used to evaluate the existing ambient sound levels and to evaluate conformance with the Site Acceptability Standards established by Housing and Urban and Development (HUD) for residential development. The purpose of the HUD guidelines is to provide standards for determining the acceptability of residential project locations with regards to existing sound levels. The HUD criteria regarding the day-night average sound level (L_{dn}) are listed below. These standards apply to L_{dn} measurements taken several feet from the building in the direction of the predominant source of noise.

Normally Acceptable – L_{dn} not exceeding 65 dBA

Normally Unacceptable–L_{dn} above 65 dBA, but not exceeding 75 dBA

Unacceptable – L_{dn} above 75 dBA.

These HUD standards do not apply to this Project, but are used as guidance regarding the suitability of the Project area with regard to background sound levels.

5.7.4 *Existing Conditions*

5.7.4.1 Baseline Noise Environment

The acoustic environment in an urban area such as the Project area results from numerous sources. Observations show that major contributors to the background sound level in the Project area include motor vehicle

traffic on the Massachusetts Turnpike to the north, local and distant streets, aircraft over-flights, mechanical equipment on nearby buildings, and general city noises such as street sweepers and police/fire sirens.

5.7.4.2 Noise Measurement Methodology

Existing baseline sound levels in the Project area were measured during the quietest overnight period when human activity and street traffic were at a minimum, and when the Project's mechanical equipment (the principal sound sources) could be operating. Since the Project's mechanical equipment may operate at any time during a 24-hour day, a weekday between 12:00 a.m. and 4:00 a.m. was selected as the worst-case time period, i.e., the time period when Project-related sounds may be most noticeable due to the quieter background sound levels. Establishing an existing background (L90) during the quietest hours of the facility operation is a conservative approach for noise impact assessment and is required by the MassDEP Noise Policy.

Table 5-9: Common Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Pressure (μPa)	Sound Level (dBA)	Indoor Sound Levels
	6,324,555	110	Rock Band at 5 m
Jet Over-Flight at 300 m		105	
	2,000,000	100	Inside New York Subway Train
Gas Lawn Mower at 1 m		95	
	632,456	90	Food Blender at 1 m
Diesel Truck at 15 m		85	
Noisy Urban Area—Daytime	200,000	80	Garbage Disposal at 1 m
		75	Shouting at 1 m
Gas Lawn Mower at 30 m	63,246	70	Vacuum Cleaner at 3 m
Suburban Commercial Area		65	Normal Speech at 1 m
	20,000	60	
Quiet Urban Area—Daytime		55	Quiet Conversation at 1m
	6,325	50	Dishwasher Next Room
Quiet Urban Area—Nighttime		45	
	2,000	40	Empty Theater or Library
Quiet Suburb—Nighttime		35	
	632	30	Quiet Bedroom at Night
Quiet Rural Area—Nighttime		25	Empty Concert Hall
Rustling Leaves	200	20	Average Whisper
		15	Broadcast and Recording Studios
	63	10	
		5	Human Breathing
Reference Pressure Level	20	0	Threshold of Hearing

Notes: μPa, or micro-Pascals, describes sound pressure levels (force/area). DBA, or A-weighted decibels, describes sound pressure on a logarithmic scale with respect to 20 μPa (reference pressure level).

Table 5-10: City of Boston on Maximum Allowable Sound Pressure Levels (db)

Octave Band (Hz)	Zoning District		
	Residential (Daytime)	Residential (All Other Times)	Business (anytime)
32 Hz	76	68	79
63 Hz	75	67	78
125 Hz	69	61	73
250 Hz	62	52	68
500 Hz	56	46	62
1000 Hz	50	40	56
2000 Hz	45	33	51
4000 Hz	40	28	47
8000 Hz	38	26	44
Broadband (dBA)	**60**	**50**	**65**

The nighttime noise measurement locations are as follows (see the Figure 1 in the **Appendix 5-C**):

- Location #1: 95 Braintree Street
- Location #2: Penniman Road Play Area
- Location #3: 1 Emery Road

5.7.4.3 Measurement Equipment

Broadband (dBA) and octave band sound level measurements were made with a Larson Davis Type 831 environmental sound level analyzer, at each monitoring location, for a duration of approximately thirty minutes. The full octave band frequency analysis was performed on the frequencies spanning 16 to 16,000 Hertz. A time-integrated statistical analysis of the data used to quantify the sound variation was also performed, including the calculation of the L_{90}, which is used to set the ambient background sound level.

The Larson Davis Type 831 is equipped with a ½" precision condenser microphone and has an operating range of 5 dB to 140 dB and an overall frequency range of 3.5 Hz to 20,000 Hz. This meter meets or exceeds all requirements set forth in the ANSI S1.4-1983 Standards for Type 1 quality and accuracy and the State and City requirements for sound level

instrumentation. Prior to any measurements, this sound analyzer was calibrated with an ANSI Type 1 calibrator that has an accuracy traceable to the National Institute of Standards and Technology (NIST). During all measurements, the Larson Davis 831 was tripod mounted at approximately five feet above the ground in open areas away from vertical reflecting surfaces.

5.7.4.4 Baseline Ambient Noise Levels

The daytime sound level monitoring was conducted on Wednesday, April 19, 2017, and the nighttime sound level monitoring was conducted overnight on Thursday, April 27 into Friday morning April 28, 2017. Weather conditions during the sound surveys were conducive to accurate sound level monitoring: the skies were clear, and the winds were light (i.e., less than 12 mph). The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The daytime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. A significant source of existing sound at all locations is motor vehicle traffic on nearby highways and local streets, residential and commercial air handling equipment, and aircraft over-flights. Similarly, the nighttime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. A significant source of existing sound at all locations is motor vehicle traffic on nearby highways and local streets, residential and commercial air handling equipment, and aircraft over-flights.

Noise monitoring at the Project Site during the daytime were used to evaluate the existing ambient sound levels and to evaluate conformance with the Site Acceptability Standards established by HUD for residential development. These sound level measurements were taken to help estimate the Ldn for the Project Site. A 30-minute sound level measurement was taken during the morning on Wednesday, April 19th between 9:11 a.m. and 9:41 a.m. at Penniman Road Play Area (Location #2) representing the closest location to the Project Site.

The main source of noise during the daytime sound level measurement was motor vehicle traffic on the Massachusetts Turnpike, Cambridge

Street and local streets, nearby construction, sirens, and aircraft over-flights. The Leq measured during the morning period was 62.8 dBA. The Leq sound level measured during the nighttime at the same location was 52.2 dBA. Using both the daytime and nighttime Leq sound levels, the calculated Ldn for the site is 62.6 dBA, which is below the HUD guideline noise limit of 65 dBA.

The results of the nighttime baseline sound level measurements are presented in **Tables 5.7-4** and the complete measurement printouts are provided in **Appendix 5-D**. The nighttime background L_{90} level ranged from was 44.6 dBA at Location #2 to 55.2 dBA at Location #1. The octave band data in **Tables 5.7-4** show that one pure tone was detected at Location #1 in the nighttime noise measurements. It is assumed that this pure tone is due to the constant traffic on the Massachusetts Turnpike.

Table 5-11: Nighttime Baseline Sound Level Measurements – April 27-28, 2017

Sound Level Measurement	Location #1 95 Braintree Street 11:00 PM- 11:30- PM	Location #2 Penniman Road Play Area 11:35 PM- 12:05 AM	Location #3 1 Emery Road 12:08 AM - 12:38 AM
Broadband (dBA) Background (L_{90})	55.2	44.6	47.3
Octave Band L_{90} (dB)			
16 Hz	53.4	50.3	53.6
32 Hz	56.8	53.3	58.6
63 Hz	57.3	52.6	56.8
125 Hz	52.0	46.9	53.1
250 Hz	48.5	41.3	46.1
500 Hz	47.5	40.2	44.2
1000 Hz	52.8*	41.6	43.0
2000 Hz	48.0	34.9	37.1
4000 Hz	36.3	24.1	29.1
8000 Hz	23.1	15.6	20.7
16000 Hz	14.9	14.8	14.9
Pure Tone?	**Yes**	**No**	**No**

*Pure tone associated with traffic along the MassPike (I-90).

5.7.5 *Overview of Potential Project Noise Sources*

The mechanical systems for the Proposed Project are in the early design stage. Typical sound power data for the equipment of the expected size and type for the

Project have been used in the acoustic model to represent the Project's mechanical equipment. The sound levels from all potential significant Project noise sources are discussed in this section.

The design for the Proposed Project is expected to include the following significant roof-top mechanical equipment:

- 254 (2-ton) condenser units
- Parking garage exhaust vent

The equipment listed above, which will be located on building roof levels, was included in the noise impact analysis. The Project's traffic was not included in the noise analysis because motor vehicles are exempt under both the City of Boston and MassDEP noise regulations.

The sound generation profiles for the mechanical equipment noise sources operating concurrently under full-load conditions were used to determine the maximum possible resultant sound levels from the Project Site as a whole, to define a worst-case scenario. To be in compliance with City and MassDEP regulations, the resultant sound level must not exceed the allowable octave band limits in the City of Boston noise regulation and must be below the allowable incremental noise increase, relative to existing noise levels, as required in the MassDEP Noise Policy.

This sound level impact analysis was performed using sound generation data for representative equipment to demonstrate compliance with noise regulations. As the building design evolves, the sound generation for the actual equipment selected may differ from the values that were utilized for the analysis.

5.7.6 *Modeling Methodology*

Future maximum sound levels at the upper floors of all existing residences bordering the Project, and at the nearest residential property lines, were calculated with acoustic modeling software assuming simultaneous operation of all mechanical equipment at their maximum loads.

The Cadna-A computer program, a comprehensive 3-dimensional acoustical modeling software package was used to calculate Project generated sound propagation and attenuation.[3] The model is based on ISO 9613, an internationally

[3] Cadna-A Computer Aided Noise Abatement Program, Version 2017.

recognized standard specifically developed to ensure the highly accurate calculation of environmental noise in an outdoor environment. ISO 9613 standard incorporates the propagation and attenuation of sound energy due to divergence with distance, surface and building reflections, air and ground absorption, and sound wave diffraction and shielding effects caused by barriers, buildings, and ground topography.

The closest/worst-case sensitive (residential) location is to the north of the project area on Braintree Street. This location was selected based on the proximity of the equipment (smaller distances correspond to larger noise impacts) and the amount of shielding by other buildings (taller nearby residential locations will experience less shielding from the Project's rooftop mechanical equipment, which may result in larger potential noise impacts from the Project). This location is expected to receive the largest sound level impacts from the Project's rooftop mechanical equipment. It can be classified as a residential zone.

The sound level impacts from the Project's mechanical equipment were predicted at the closest residential locations to the north, west, and south. The site is bound by commercial uses to the east. Figure 1 in **Appendix 5-C** shows the locations of the modeled noise receptors. Noise impacts at other nearby noise-sensitive locations farther from the Project Site will be less than those predicted for these receptors.

5.7.7 *Future Sound Level of Project*

The City of Boston and MassDEP noise standards apply to the operation of the mechanical equipment at the proposed Project. The details of the noise predictions are presented in Tables 5.7-5 through 5.7-22. The sound impact analysis includes the simultaneous operation of the Project's rooftop mechanical equipment. The predicted sound levels are worst-case predictions that represent all hours of the day, as the analysis assumes full operation of the mechanical equipment 24-hours a day. The typical sound level impacts from the mechanical equipment will likely be lower than what is presented here, since most of the mechanical equipment will operate at full-load only during certain times of the day and during the warmer months of the year, it is not likely that all of the mechanical equipment will operate at the same time. Sound level impacts at locations farther from the Project (e.g. other residences, etc.) will be lower than those presented in this report.

5.7.7.1 City of Boston Noise Standards

The noise impact analysis results, presented in **Tables 5.7-5 through 5.7-22**, reveal that the sound level impact at the noise-sensitive receptors will be between 39 and 45 dBA. The smallest sound level impact of 39 dBA is predicted to occur at 451 Cambridge Street (Location R19). The largest sound level impact of 45 dBA is predicted to occur at 90 Braintree St (Location R2). Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. Note that sound levels from the Project will be below the residential nighttime limits at all times. The results also demonstrate compliance with the City of Boston, residential, non-daytime, octave band noise limits at all locations.

The City of Boston noise limits for business areas are significantly higher than the nighttime noise limits for residential areas **(see Table 5.7-3)**. The Project will also easily comply with the City of Boston business area noise limits at all surrounding commercial properties.

5.7.7.2 MassDEP Noise Regulations

The predicted sound level impacts at the noise-sensitive locations were added to the measured L90 value of the quietest daily hour to test compliance with MassDEP's noise criteria. Assuming the Project's mechanical noise is constant throughout the day, the Project will cause the largest increase in sound levels during the period when the lowest background noise occurs. Minimum background sound levels (diurnal) typically occur between 12:00 a.m. and 4:00 a.m.

As shown in **Tables 5.7-5 through 5.7-22**, the Project is predicted to produce a less than 3 dBA change in the background sound levels at all modeled locations. Therefore, the Project's worst-case sound level impacts during the quietest nighttime periods will be in compliance with the MassDEP allowed noise increase of 10 dBA. The noise predictions for each octave band indicate that the mechanical equipment will not create a pure tone condition at any location.

5.7.7.3 HUD Site Acceptability Standards

The maximum predicted sound level impacts from the Project are well below 65 dBA and will not increase the existing Ldn in the Project area. Therefore, the Project area will still comply with HUD's Site Acceptability

Standards without any additional mitigation incorporated into the building design after the Project is completed.

5.7.8 *Conclusions*

Sound levels at all nearby sensitive locations and at all property lines will fully comply with the most stringent City of Boston and MassDEP daytime and nighttime sound level limits, and the HUD design Noise Levels. This acoustic analysis demonstrates that the Project's design will meet the applicable acoustic criteria.

Table 5-12: 61 Braintree Street (Location R1) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	45.1
63 Hz	67	46.1
125 Hz	61	47.7
250 Hz	52	43.6
500 Hz	46	38.9
1000 Hz	40	34.6
2000 Hz	33	27.3
4000 Hz	28	18.3
8000 Hz	26	8.9
Broadband (dBA)	**50**	40.8
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 1)	55.2
Tremont Crossing Project*	40.8
Calculated Combined Future Sound Level	55.4
Calculated Incremental Increase	+0.2
Compliance with MassDEP Noise Policy?	**Yes**

* Assumes full-load operation of all mechanical equipment.

Note: MassDEP Policy allows a sound level increase of up to 10 dBA.

Table 5-13: 90 Braintree Street (Location R2) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	42.1
63 Hz	67	43.5
125 Hz	61	48.6
250 Hz	52	47.3
500 Hz	46	42.9
1000 Hz	40	39.0
2000 Hz	33	32.8
4000 Hz	28	24.5
8000 Hz	26	12.5
Broadband (dBA)	**50**	44.7
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	55.2
Braintree Street Project*	44.7
Calculated Combined Future Sound Level	55.6
Calculated Incremental Increase	+0.4
Compliance with MassDEP Noise Policy?	**Yes**

* Assumes full-load operation of all mechanical equipment.

Note: MassDEP Policy allows a sound level increase of up to 10 dBA.

Table 5-14: 20 Hano Street (Location R3) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	42.1
63 Hz	67	43.5
125 Hz	61	48.2
250 Hz	52	47.2
500 Hz	46	42.5
1000 Hz	40	37.7
2000 Hz	33	30.7
4000 Hz	28	21.3
8000 Hz	26	6.5
Broadband (dBA)	**50**	**44**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	44
Calculated Combined Future Sound Level	47.3
Calculated Incremental Increase	+2.7
Compliance with MassDEP Noise Policy?	**Yes**

* Assumes full-load operation of all mechanical equipment.

Note: MassDEP Policy allows a sound level increase of up to 10 dBA.

Table 5-15: 24 Hano Street (Location R4) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.4
63 Hz	67	42.8
125 Hz	61	48.0
250 Hz	52	47.3
500 Hz	46	42.5
1000 Hz	40	37.6
2000 Hz	33	30.7
4000 Hz	28	21.4
8000 Hz	26	6.5
Broadband (dBA)	**50**	**44**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	44
Calculated Combined Future Sound Level	47.3
Calculated Incremental Increase	+2.7
Compliance with MassDEP Noise Policy?	**Yes**

* Assumes full-load operation of all mechanical equipment.

Note: MassDEP Policy allows a sound level increase of up to 10 dBA.

Table 5-16: 28 Hano Street (Location R5) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.4
63 Hz	67	42.9
125 Hz	61	48.0
250 Hz	52	47.1
500 Hz	46	42.4
1000 Hz	40	37.5
2000 Hz	33	30.5
4000 Hz	28	21.1
8000 Hz	26	6.2
Broadband (dBA)	**50**	**43.8**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43.8
Calculated Combined Future Sound Level	47.2
Calculated Incremental Increase	+2.6
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-17: 32 Hano Street (Location R6) Estimated Future Level Impacts at Anytime

sOctave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.5
63 Hz	67	42.9
125 Hz	61	48.0
250 Hz	52	47.2
500 Hz	46	42.5
1000 Hz	40	37.7
2000 Hz	33	30.9
4000 Hz	28	21.2
8000 Hz	26	6.2
Broadband (dBA)	**50**	**44**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	44
Calculated Combined Future Sound Level	47.3
Calculated Incremental Increase	+2.7
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-18: 34 Hano Street (Location R7) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.6
63 Hz	67	43
125 Hz	61	48
250 Hz	52	47
500 Hz	46	42.4
1000 Hz	40	37.9
2000 Hz	33	30.9
4000 Hz	28	21.3
8000 Hz	26	6.0
Broadband (dBA)	**50**	**43.9**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43.9
Calculated Combined Future Sound Level	47.3
Calculated Incremental Increase	+2.7
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-19: 40 Hano Street (Location R8) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.7
63 Hz	67	43.1
125 Hz	61	47.9
250 Hz	52	46.5
500 Hz	46	42.3
1000 Hz	40	37.8
2000 Hz	33	30.8
4000 Hz	28	21.1
8000 Hz	26	5.7
Broadband (dBA)	**50**	**43.7**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43.7
Calculated Combined Future Sound Level	47.2
Calculated Incremental Increase	+2.6
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-20: 44 Hano Street (Location R9) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.0
63 Hz	67	43.2
125 Hz	61	47.5
250 Hz	52	46.1
500 Hz	46	42.2
1000 Hz	40	37.4
2000 Hz	33	30.4
4000 Hz	28	20.7
8000 Hz	26	5.1
Broadband (dBA)	**50**	**43.4**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43.4
Calculated Combined Future Sound Level	47.1
Calculated Incremental Increase	+2.5
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-21: 48 Hano Street (Location R10) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.1
63 Hz	67	42.9
125 Hz	61	47.1
250 Hz	52	45.9
500 Hz	46	41.6
1000 Hz	40	36.8
2000 Hz	33	29.9
4000 Hz	28	20.2
8000 Hz	26	4.5
Broadband (dBA)	**50**	**43**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43
Calculated Combined Future Sound Level	46.9
Calculated Incremental Increase	+2.3
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-22: 50 Hano Street (Location R11) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.1
63 Hz	67	42.4
125 Hz	61	46.9
250 Hz	52	45.9
500 Hz	46	41.9
1000 Hz	40	37.1
2000 Hz	33	30.2
4000 Hz	28	20.4
8000 Hz	26	4.2
Broadband (dBA)	**50**	**43.2**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43.2
Calculated Combined Future Sound Level	47.0
Calculated Incremental Increase	+2.4
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-23: 56 Hano Street (Location R12) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.1
63 Hz	67	42
125 Hz	61	46.7
250 Hz	52	46.3
500 Hz	46	41.8
1000 Hz	40	37.0
2000 Hz	33	30.1
4000 Hz	28	20.2
8000 Hz	26	3.9
Broadband (dBA)	**50**	**43.2**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	43.2
Calculated Combined Future Sound Level	47.0
Calculated Incremental Increase	+2.4
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-24: 58 Hano Street (Location R13) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.1
63 Hz	67	41.9
125 Hz	61	46.3
250 Hz	52	45.7
500 Hz	46	41.0
1000 Hz	40	36.2
2000 Hz	33	29.3
4000 Hz	28	19.5
8000 Hz	26	3.1
Broadband (dBA)	**50**	**42.5**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	42.5
Calculated Combined Future Sound Level	46.7
Calculated Incremental Increase	+2.1
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-25: 60 Hano Street (Location R14) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.1
63 Hz	67	41.8
125 Hz	61	45.9
250 Hz	52	45.3
500 Hz	46	40.7
1000 Hz	40	36.0
2000 Hz	33	29
4000 Hz	28	19.1
8000 Hz	26	2.5
Broadband (dBA)	**50**	**42.2**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	42.2
Calculated Combined Future Sound Level	46.6
Calculated Incremental Increase	+2.0
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-26: 66 Hano Street (Location R15) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.2
63 Hz	67	41.7
125 Hz	61	45.7
250 Hz	52	45.2
500 Hz	46	40.6
1000 Hz	40	35.9
2000 Hz	33	29.0
4000 Hz	28	19.0
8000 Hz	26	1.9
Broadband (dBA)	**50**	**43.9**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	42.1
Calculated Combined Future Sound Level	46.5
Calculated Incremental Increase	+1.9
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-27: 72 Hano Street (Location R16) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.2
63 Hz	67	41.7
125 Hz	61	45.5
250 Hz	52	44.8
500 Hz	46	40.2
1000 Hz	40	35.6
2000 Hz	33	28.6
4000 Hz	28	18.6
8000 Hz	26	1.3
Broadband (dBA)	**50**	**41.7**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	41.7
Calculated Combined Future Sound Level	46.4
Calculated Incremental Increase	+1.8
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-28:76 Hano Street (Location R17) Estimated Future Level Impact at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.3
63 Hz	67	41.6
125 Hz	61	45.6
250 Hz	52	44.5
500 Hz	46	40.0
1000 Hz	40	35.4
2000 Hz	33	28.4
4000 Hz	28	18.1
8000 Hz	26	0.4
Broadband (dBA)	**50**	**41.5**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	44.6
Braintree Street Project*	41.5
Calculated Combined Future Sound Level	46.3
Calculated Incremental Increase	+1.7
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-29: 83 Hano Street (Location R18) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.2
63 Hz	67	42.5
125 Hz	61	43.9
250 Hz	52	42.0
500 Hz	46	38.0
1000 Hz	40	33.6
2000 Hz	33	26.4
4000 Hz	28	15.5
8000 Hz	26	0.0
Broadband (dBA)	**50**	**39.4**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	47.3
Braintree Street Project*	39.4
Calculated Combined Future Sound Level	48.0
Calculated Incremental Increase	+0.7
Compliance with MassDEP Noise Policy?	**Yes**

Table 5-30: 451 Cambridge Street (Location R19) Estimated Future Level Impacts at Anytime

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41.0
63 Hz	67	42.7
125 Hz	61	44.2
250 Hz	52	42.8
500 Hz	46	37.7
1000 Hz	40	32.9
2000 Hz	33	25.2
4000 Hz	28	14.9
8000 Hz	26	-0.2
Broadband (dBA)	**50**	**39.3**
Compliance with the City of Boston Noise Regulation?		**Yes**

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location # 2)	47.3
Braintree Street Project*	39.3
Calculated Combined Future Sound Level	47.9
Calculated Incremental Increase	+0.6
Compliance with MassDEP Noise Policy?	**Yes**

5.8 Flood Zones

The Site is not located within any flood zones.

5.9 Water Quality

The water quality runoff from the Site will be greatly enhanced in the built condition. It is anticipated that on site stormwater will be treated with deep sump hooded catch basins, subsurface infiltration systems and proprietary water quality units including phosphorous treatment before being discharged to the City drainage system. Flows from the floor drains within the parking structure will be treated with an oil and gas separator before discharge to the municipal sanitary sewer system.

5.10 Geotechnical

5.10.1 *Exploration Program*

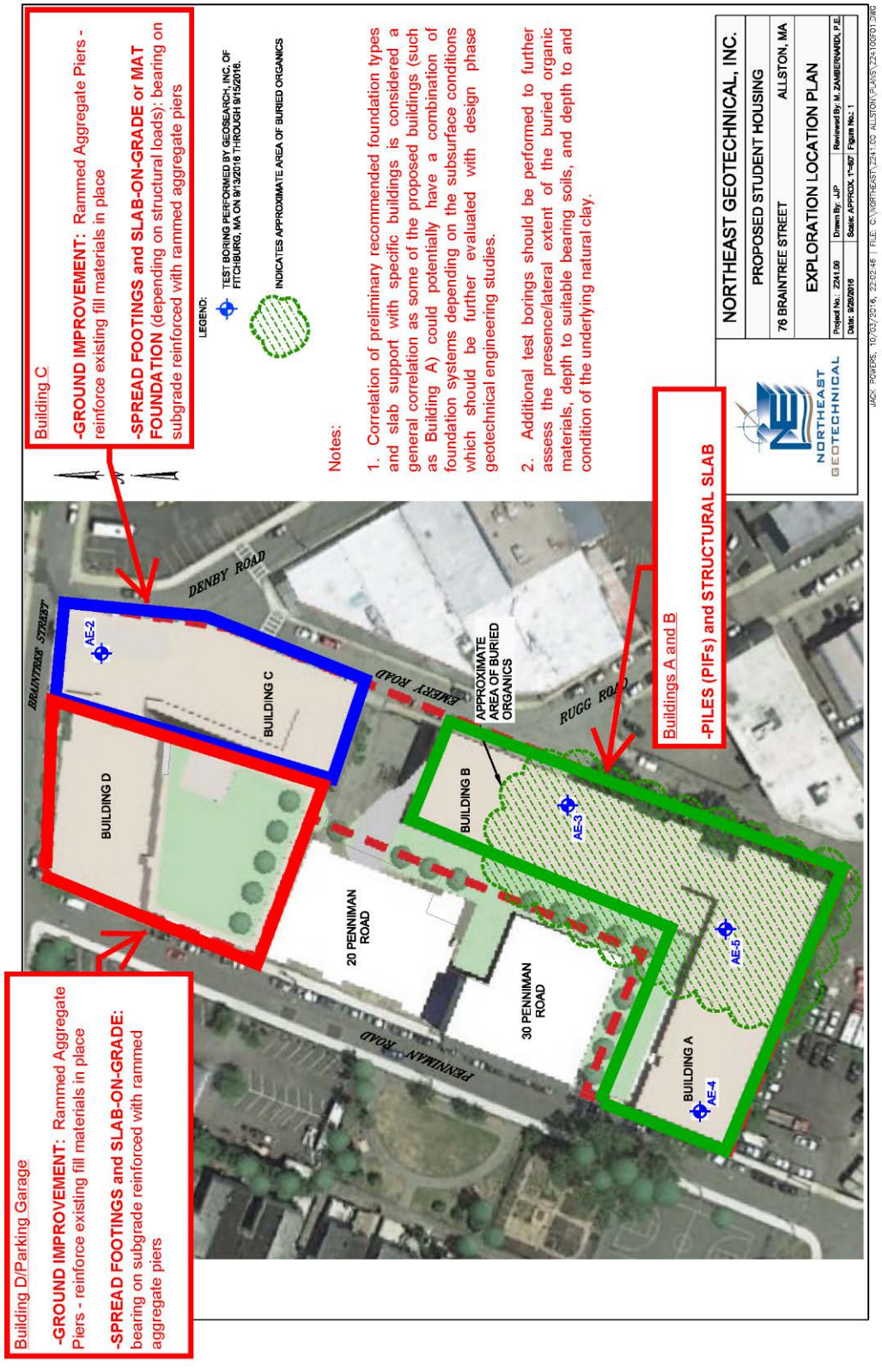
Northeast Geotechnical, Inc. performed preliminary studies in the Fall of 2016 that included observation/logging of four soil test borings. Based on the results of those borings Northeast Geotechnical, Inc. was able to provide preliminary recommendations pertaining to building foundations, slab support, ground improvement and other earth work considerations.

Initial test boring results yielded typical subsurface conditions found within the City of Boston and contained additional trace amounts of organic materials. Additional boring tests will be performed as the design advances to assess the presence/lateral extent of the buried organic materials, depth of the suitable bearing soils, and depth to and condition of the underlying clay.

5.10.2 *Subsurface Conditions*

Northeast Geotechnical, Inc.'s preliminary foundation recommendations and Geotechnical analysis are set forth on Figure 5-14. These recommendations are subject to change as the design advances, but serve as our initial basis of design moving forward.

Figure 5-14 Exploration Location Plan



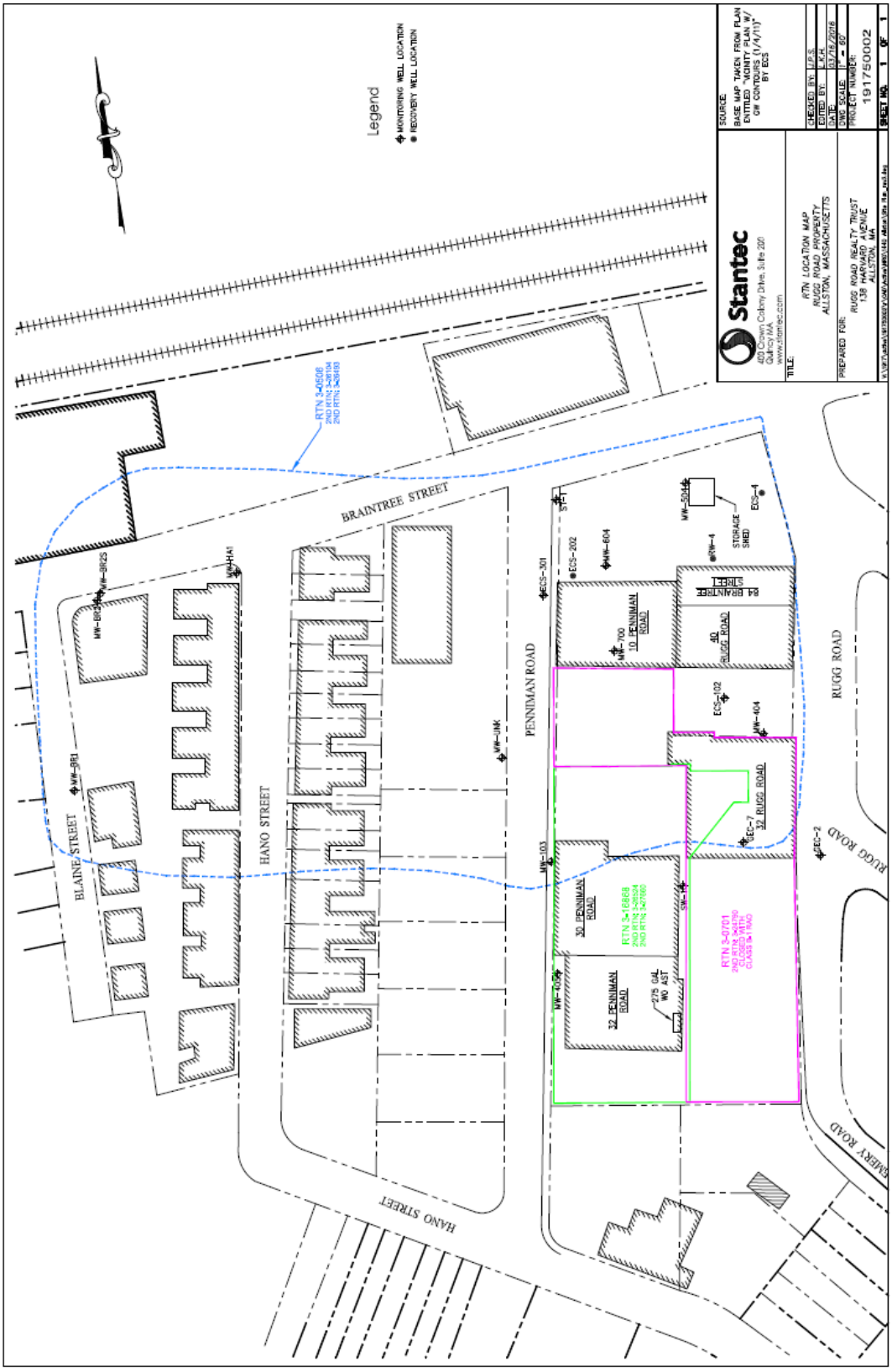
5.11 Solid and Hazardous Waste

The following is a summary of known environmental conditions and current status of on-going review and actions with the Massachusetts Department of Environmental Protection (DEP).

5.11.1 *Massachusetts Contingency Plan*

- The project site currently is being regulated under the Massachusetts Contingency Plan. A study of the existing site was performed to understand previous uses, site context and environmental conditions. This study can be found in Appendix 3. Additionally, several release tracking numbers (RTNs) have been assigned (see Appendix 3 and Figure 5-15).
    - RTN 3-0506 is currently open and 3-0506 was assigned for a release of chlorinated volatile organic compounds (CVOCs) and includes the parcels of land with street addresses of 84-76 Braintree Street, 10, 12, 20 and 30 Penniman Road; and 20-32 and 40 Rugg Road. The following RTNs were also issued and subsequently administratively linked to 3-0506: RTN 3-26104 and RTN 3-26493.
    - RTN 3-0701 was closed with a Class B1 Response Action Outcome (RAO) statement in 2008. This RTN was assigned for a downgradient property status for CVOCs and includes the parcels at 20 Penniman and 28-32 Rugg Road. RTN 3-24790 was administratively linked to this RTN.
    - RTN 3-16868 was assigned for a release of petroleum, includes 30 and 40 Penniman and the eastern portion of the building at 28-32 Rugg Road, and RTNs 3-26524 and 3-27600 were administratively linked to this RTN. A Class C2 RAO was submitted in 2011
    - RTN 3-25927 was issued for a release of hydraulic oil and was closed with a Class A1 RAO in 2006.
- RTN 3-0506 is currently classified as a Tier I site and a Phase II Comprehensive Site Assessment Report is due to MassDEP by June 26, 2017. A Permanent or Temporary Solution must be submitted by June 26, 2019.
- There are no Activity and Use Limitations (AULs) on any portion of the project site.
- We are not aware of any Reportable Conditions at the property that have not yet been assigned an RTN.

Figure 5-15: RTN Location Map



5.11.2 *Solid and Hazardous Waste*

The Project will generate solid waste during demolition and construction. The Project will involve the demolition of five buildings with a total square footage of approximately 41,000 SF.

New building construction and utility installation will may generate as much as 10,000 cubic yards of soil/urban fill that is structurally unsuitable for reuse on-site, and therefore requires off-site disposal. Additionally, previous environmental testing has identified approximately 2,000 cubic yards of soils impacted by CVOCs that will require off-site disposal at a licensed solid and/or hazardous waste facility. Additional testing of these soils/fill will be undertaken to provide adequate characterization.

Concrete and brick materials will be crushed and used on-site under parking lots. Metal will be recycled at off-site facilities. Gypsum, wood, and other materials which are not amenable to reuse or for recycling, will be disposed at an in-state construction demolition debris landfill. Prior to demolition activities, US EPA-regulated Universal Waste (e.ge, fluorescent lights, batteries, refrigerants) will be removed and recycled or disposed at licensed off-site facilities. Asbestos is present in the buildings, and prior to demolition, will be abated and disposed off-site at licensed disposal facilities, in accordance with MassDEP and US EPA NESHAPs requirements.

Anti-Idling

The Project Bid Specifications will include provisions to prohibit idling of construction vehicles, and also the vehicles of construction, facility operations and management staff will be required to observed the Project's no-idling policy. To further limit potential emissions, the use of diesel equipment will be minimized wherever possible, and the Project Bid Specifications will specify that low-sulfur fuel will be utilized for needed diesel-using equipment. Scrubbers will be utilized on equipment deemed essential, which exceed Massachusetts air quality standards. Propane or electric powering will be used, where possible, instead of gasoline, especially for smaller equipment, such as Bobcats, small demolition hammers, and forklifts. Incentives are being contemplated to encourage electric vehicles and hybrids to be used of personnel vehicles.

5.12 Construction Impacts/Construction Management Plan

5.12.1 *Construction Management Plan*

The Construction Management Plan (CMP) will be submitted to The Boston Transportation Department for their approval prior to the start of construction and will include specific mitigation measures and staging plans to minimize impacts to abutters. The construction manager will be bound by the CMP.

5.12.2 *Construction Methodology*

5.12.2.1 Construction Activity Schedule

The construction period for the Project is expected to be approximately 12 to 18 months in duration. It is anticipated that the Project is estimated to start on or about the spring of 2018. Typically, construction hours will be from 7:00 a.m. to 6:00 p.m. Monday through Saturday. Weekend and off-hour work is anticipated on this project in order to minimize impact on vehicular and pedestrian traffic. We will attain all necessary permits in advance of these potential off hour activities occurring.

5.12.2.2 Construction Staging Area

The proposed Logistics Plan is designed to isolate the construction while providing safe access for pedestrians and automobiles during normal day-to-day activities and emergencies. Interaction with the public will occur mainly along Rugg Road, Braintree Street and Penniman Road.

The Project consists of demolishing the existing structures, ground improvements, relocations of existing utilities, placing spread footings/foundation walls and the erection of mixed use building. The buildings will consist of retail space, a parking structure, residential apartments, and amenity spaces.

The site will be secured by a 6-foot high fence with privacy screening in accordance with the Logistics Plan. The site will utilize 2-3 primary gates for access.

All construction material delivery trucks will able to drive directly into the site to load/unload. Trucks will not be allowed to park or idle on the neighborhood streets. For major deliveries, such as steel, large pieces of

mechanical equipment, etc., an off-site staging and marshaling area will be utilized. If necessary, a wheel wash station will be located at the exit to the site. Also, adjacent streets/sidewalks will be swept as necessary to minimize accumulations of dirt and dust. Mechanical sweeping will be utilized, continuously during the excavation and foundation phases.

If it becomes necessary, off hour work will require a special permit and will be coordinated with BTD and the Mayor's Office of Neighborhood Services (MONS).

Proper signage and Way Finding will direct pedestrians safely around the construction job site and activities

5.12.2.3 Perimeter Protection/Public Safety

The Project's general contractor will work to ensure the staging areas minimize impact to pedestrian and vehicular flow. The specific configuration of staging and pedestrian access around the site will vary depending on the phase of the work being performed. In general, secured fencing will be used to isolate construction areas from pedestrian traffic, pedestrian way finding signage will be installed and Police Details will be provided as needed to facilitate traffic flow. Work will be performed outside of the site fence for utility work and connections. This work will be isolated from traffic and pedestrians utilizing traffic barriers. All utility work within the public ways, will also have a dedicated police detail.

Construction procedures will be designed to meet all OSHA safety standards for specific site construction activities. Subcontractors will implement and manage their own Health and Safety Program for the project. All Subcontractors are required to wear appropriate personal protective equipment.

Snow removal and ice treatment will be provided on the surrounding sidewalks, as will trash and debris clean up. Snow removal will occur in a timely manner and will predominantly occur on off hours.

5.12.3 *Construction Traffic Impacts*

5.12.3.1 Construction Trip Generation and Worker Parking

The number of workers required during the construction will vary with an estimated average daily workforce of 234 during peak of construction.

Because the workforce will arrive prior to peak traffic periods, these trips are not expected to impact traffic conditions. Additionally, jobsite personnel will be encouraged to utilize public transportation. No personal vehicles will be allowed to park on the adjacent residential streets. Terms and conditions related to workforce parking and public transportation use will be written into each subcontract.

5.12.3.2 Truck Routes and Volumes

Truck traffic will vary throughout the construction period, depending on the activity. Given the sites location, with easy access to major roadways such as Cambridge Street, Brighton Avenue and I-90/Mass Pike, there will be limited truck or construction access through local roads.

5.12.4 *Construction Air Quality*

5.12.4.1 Dust Control

To reduce emission of fugitive dust and minimize impacts on the local environment, the construction contractor will adhere to a number of strictly enforced mitigation measures. These include:

- Wetting agents will be used regularly to control and suppress dust that may come from the construction materials;
- All trucks used for transportation of construction debris will be fully covered;
- Actual construction practices will be monitored to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized and to ensure that any emissions of dust are negligible;
- Street and sidewalks will be cleaned periodically to minimize dust accumulations;
- A wheel wash station will be implemented prior to exiting to the City streets during site work activities, if warranted;
- A preconstruction survey will be conducted to determine the existing dust particle levels in the area and set a baseline for our controls. This survey will also document the conditions of the surrounding structures to establish existing dust levels on these structures.

5.12.5 *Construction Noise*

The project will require the use of equipment that can be heard from offsite locations. This project is committed to mitigating noise impacts. Increased community sound levels, however, are an inherent consequence of construction activities. The general contractor will record baseline neighborhood sound levels before the start of construction to better understand the existing conditions at the site. Construction will occur during the daytime hours as defined by the Boston Noise Regulation (7:00 a.m. to 6:00 p.m. except Sundays). In some instances, a second shift, off hour, holiday and Saturday may be required. When these events arise, all required permits will be in place.

5.12.6 *Rodent Control*

The City of Boston has declared that the infestation of rodents in the City is a serious problem. In order to control the infestation, the City enforces the requirements established under the Massachusetts State Sanitary Code and the State Building Code that the extermination of rodents shall be required for issuance of permits for demolition, excavation, foundation and basement rehabilitation. The proposed project will develop a rodent control program prior to its construction start. We will conduct a preconstruction survey to establish the rodent level. This survey will also document existing conditions that may affect the ability to manage the rodent control such as trash containment, etc.

5.13 Wildlife Habitats

The Project is located outside of the Estimated Habitats of Rare Wildlife and the Priority Habitats of Rare Species according to the most recent GIS polygons for each as maintained by the Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife.

5.14 Historic and Archaeological Impacts

This Section describes the historic and archeological resources that may be affected by the Project.

5.14.1 *Historic Resources Within the Site*

The Project Site does not contain any properties included in the Inventory of Historic and Archeological Assets of the Commonwealth (Inventory), maintained by the Massachusetts Historical Commission (MHC).

5.14.2 *Historic Resources Within Vicinity of the Site*

The Project Site does not contain sites listed on the Inventory and the State and National Registers of Historic Places.

5.14.3 *Archeological Resources on the Project Site*

There are no known archeological resources listed in the State and National Registers of Historic Places or included in the Inventory located within the Project Site.

5.14.4 *Massachusetts Historical Commission (MHC) Review*

The Project is not within any Historic Districts and therefore is not subject to MHC review.

5.14.5 *Article 85 – Demolition Delay*

The project has filed an application with the Boston Landmarks Commission under Article 85, for demolition of Buildings believed to be in excess of 50 years in age. Based on our preliminary findings, it is believed that these buildings will not be determined to have "historical significance".

5.15 Tidelands

The project is not in the vicinity of any tidelands or lands subject to flooding.

6.0 TRANSPORTATION

6.1 Introduction

This Chapter provides a description of the Project's operations and assesses any impacts to the local street network. The transportation analysis conforms to the Boston Transportation Department (BTD) Transportation Access Plans Guidelines and is consistent with the City's policy for Complete Streets which puts pedestrians, bicyclists and transit users on equal footing with motor-vehicle drivers. The initiative aims to improve the quality of life by creating streets that are sustainable transportation networks.

The transportation analysis assesses the site's transportation infrastructure today and in the future with and without the project under the following conditions:

- 2017 Existing Condition
- 2022 No Build Condition
- 2022 Build Condition

6.2 Project Overview

The Project includes the construction of 261 residential apartment units with 168 supporting parking spaces in an automated parking structure. At the ground floor, there will also be approximately 2,700 square feet of neighborhood-oriented retail space as shown in **Table 6-1**.

Table 6-1: Development Program Summary

	Size
Apartments	Up to 261 units
Commercial/Retail	2,700 SF
Parking	168 spaces

The Project is loosely bounded by Braintree Street to the north, Denby Road/Rugg Road to the east, and Penniman Road to the west. The site is currently a mix of small commercial buildings and an open gravel parking lot being used for adjacent construction activity.

The Project will include an aggressive Transportation Demand Management (TDM) plan to encourage residents to use alternative modes of transportation. Ample bicycle parking will be provided on-site for residents and adjacent sidewalks will be reconstructed and made ADA accessible.

6.3 Study Area

The study area was developed in coordination with the Boston Transportation Department (BTD) and includes the intersections that are most likely to accommodate project-generated traffic. These intersections are:

- Cambridge Street/Hano Street
- Cambridge Street/Denby Street
- Braintree Street/Penniman Road
- Braintree Street/Rugg Road

The study area can be found in **Figure 6-1**.

6.4 Existing Conditions

This section describes the 2017 existing conditions of the study area's transportation facilities, including the area's street network, pedestrian and bicycle facilities, public transportation services, and nearby public parking.

6.4.1 *Data Collection*

Traffic turning movement counts (TMCs) were conducted during the AM and PM peak periods at the study area intersections on April 13, 2017. These counts included passenger vehicles, heavy vehicles, pedestrians and bicycles.

The resulting peak hours from the counts are 7:45 AM to 8:45 AM and 4:45 PM to 5:45 PM. These volumes served as the baseline for the traffic analysis.

No seasonal adjustment was made to the baseline counts because colleges were still in session at the time of the data collection and May traffic historically is above average in Boston.

6.4.2 *Roadway Inventory*

Braintree Street is a local roadway located adjacent to the project site to the north. It runs east-west between Everett Street and Franklin Street. Parking is provided on the south side of the street adjacent to the project site.

Cambridge Street is an urban principal arterial south of the project site. It runs east-west from Washington Street in Brighton Center to Memorial Drive, and then continues as River Street in the City of Cambridge. In the site vicinity, it is a two-way roadway with parking on both sides of the street, striped bicycle lanes, and one travel lane in each direction.

Penniman Road is a local road west of the project site that runs north-south between Braintree Street and Hano Street. Parking is available on the east side of the street adjacent to the project site.

Rugg Road is a local road connecting Braintree Street to Cambridge Street along the eastern site frontage. Immediately adjacent to the site, the street currently operates with alternating one-way traffic due to a narrowed travel lane due to parking on both sides of the street. In the future, this road will become one-way southbound to Denby Street.

Denby Road is a local roadway located east of the project site. It runs north-south between Rugg Road and Cambridge Street. The road is two-way with no pavement markings and parking on the east side. In the future, the road's operation will be changed to one-way southbound travel only.

6.4.3 *Intersections*

Existing motorized traffic volumes collected at the following site intersections can be found in **Figure 6-2.**

Cambridge Street/Hano Street is a three-legged, unsignalized intersection. The Cambridge Street eastbound and westbound approaches consist of single travel lanes with parking along both sides. The Hano Street southbound approach consists of a single lane with no pavement markings provided. Handicap-accessible ramps are provided at the intersection. Crosswalks are provided across the intersection's north and east legs.

Cambridge Street/Denby Road is a three-legged, signalized intersection under BTD jurisdiction. The Cambridge Street eastbound and westbound approaches consist of single travel lanes with parking provided on both sides. The intersection is striped and signed with DO NOT BLOCK THE BOX regulations. The Denby Road southbound approach consists of a single lane with no pavement markings provided. Crosswalks are provided across Denby Street and the east leg of Cambridge Street. Pedestrian crossings occur concurrently with parallel vehicle traffic.

Braintree Street/Penniman Road is a three-legged, unsignalized T-intersection. The Braintree Street eastbound and westbound approaches consist of single travel lanes, with no pavement markings provided. The Penniman Road northbound approach consists of a single travel lane under STOP control, with no pavement markings provided. Handicap-accessible ramps are provided crossing Penniman Road.

Braintree Street/Rugg Road is a three-legged, unsignalized T-intersection. The Braintree Street eastbound and westbound approaches consist of single travel lanes, with no pavement markings provided. The Rugg Road northbound approach consists of a single travel lane under STOP control with no pavement markings provided. Crosswalks are not provided at the intersection; however, handicap-accessible ramps are provided crossing the Rugg Road approach.

6.4.4 *Pedestrians*

The study area provides ample sidewalks on all roadways, along with crosswalks with pedestrian signals at signalized intersections. The sidewalks immediately adjacent to the Project site are considered to be in good condition.

Based on the pedestrian counts, Cambridge Street is a highly travelled pedestrian corridor, as shown in **Figure 6-3**. At the Cambridge Street/Denby Road intersection, approximately 50 people cross the north leg during the weekday evening peak hour. Adjacent to the site, pedestrian volumes are relatively low, with fewer than 20 crossings per hour along the Braintree Street frontage.

The project proximity to these pedestrian amenities is reflected in the "Walk Score" for the Project Neighborhood, which scores a 96 where daily life and errands do not require a car.

6.4.5 *Bicycles*

In recent years, the number of bicycles in the study area has increased with the City's initiative to make Boston more bicycle friendly as part of its Complete Streets program. Bicycle lanes are provided on Cambridge Street. No bicycle accommodations are provided adjacent to the site on Braintree Street, Rugg Road, or Denby Street. A Hubway bicycle-sharing station is located nearby at Union Square (Brighton Avenue at Cambridge Street).

The project will incorporate a 1 for 1 bike storage program on the ground floor as well as a repair/compressor stand as part of the building amenities package.

Bicycle volumes collected at the study area intersections are shown in **Figure 6-4**. The majority of bicycles were counted using Cambridge Street during the peak hours.

6.4.6 *Public Transportation*

Three bus routes provided by the Massachusetts Bay Transportation Authority (MBTA) operate in close proximity to the Project site, as shown in **Figure 6-5.** Additional information about these services, including peak period headways, is provided in **Table 6-2**.

Table 6-2: MBTA Bus Service

Service	Origin-Destination	Approximate Peak Headways
Route 57	Watertown Yard-Kenmore Station via Cambridge St. and Brighton Ave.	3-10 minutes
Route 64	Oak Square – University Park or Kendall/MIT via Beacon St. and Cambridge St.	10-23 minutes
Route 66	Harvard Square – Dudley Station via Cambridge St. and Brighton Ave.	8-10 minutes

Source: MBTA

The MBTA's Green Line "B Branch," which provides rail service between Boston College and Park Street Station, is located approximately one half-mile from the Project site at the Harvard Avenue/Commonwealth Avenue intersection.

In addition, the Boston Landing Commuter Rail Station is located to the west of the Everett Street Bridge at the New Balance Headquarters approximately a quarter-mile from the site. This station recently opened in the Spring of 2017 and serves the MBTA's Framingham/Worcester Line.

6.4.7

6.4.7 *Public Parking*

On-street parking is provided immediately adjacent to the Project site on Braintreet Street, Penniman Road, and Denby/Rugg Road. This parking is unregulated with no posted restrictions other than street sweeping. On-street parking regulations were inventoried during April 2017 and are shown in **Figure 6-6**.

There is no public off-street parking in close proximity to the site. The closest Zipcar location is at 26 Allston Street, just under a half-mile walk from the Project site.

6.5 2022 No Build Condition

The 2022 No Build Condition considers area growth and transportation infrastructure change that may affect the study area's transportation operations independent of the Project. This analysis includes project-specific growth that has been forecast as part of other area development projects as well as general background growth associated with an increasing city population or other development projects that may not have detailed traffic forecasts available.

The following projects are included in the 2022 No Build Condition:

- **Boston Landing,** totaling 1.43 million square feet including a 250,000 sf world headquarters for New Balance, a 350,000 sf sports complex, a 140,000 sf boutique hotel, three office buildings totaling 650,000 sf, and 65,000 sf of retail/restaurant uses. Mitigation for this project includes changes to the local street network (discussed later in this section).
- **75 Braintree Street,** which includes 80 residential rental units, 6,000 sf of commercial space and 67 parking spaces.

In addition, a 1 percent annual growth rate was applied to existing traffic volumes. This growth rate is slightly higher than recent trends in the neighborhood to account for projects that do not have specific traffic forecasts, including:

- **Penniman on the Park,** totaling approximately 41,000 sf. This project includes 36 condominium units with 17 covered parking spaces and 10 surface parking spaces on an adjacent lot.
- **392-398 Cambridge Street,** totaling approximately 48,500 sf of mixed-use development. The project consists of a new five-story building with 32 condominium units, 5,100 square feet of retail and off-street parking for 58 vehicles.

- **31 N. Beacon Street,** including approximately 32,110 sf of mixed-use consisting of 20 residential rental units, 22 off-street parking spaces, and ground floor retail.
- **450 Cambridge Street,** including construction of 40 rental apartment units and 40 parking spaces.

As mentioned previously, the Brighton Landing Commuter Rail Station recently opened in close proximity to the site. While this station is expected to reduce auto-dependency in the area, no adjustment to the baseline traffic volumes collected prior to the station opening was made.

In addition, the future analysis includes planned modifications to make Rugg Road/Denby Street one-way southbound to Cambridge Street. This change is paired with changes at Cambridge Street/Harvard Avenue/Franklin Street to allow Franklin Street to become one-way northbound. Parking will also be removed on Cambridge Street between Harvard Avenue and Denby Street to allow westbound Cambridge to operate with two lanes. These changes are planned as part of the Boston Landing Project and are included in the No Build scenario traffic model.

Figure 6-7 displays the 2022 No Build volumes.

6.6 2022 Build Condition

The 2022 Build Condition assumes completion and full occupancy of the Project. It includes the addition of up to 261 residential units, 2,700 square feet of neighborhood-oriented retail and 168 parking spaces.

6.6.1 *Site Access and Circulation*

The Project will have a driveway on Penniman Road for residential access to the automated parking garage. There will be a second curb cut on Rugg Road for trucks to access the off-street loading area and provide trash pick-up.

6.6.2 *Trip Generation and Trip Distribution*

Gross trip generation for the development was estimated using trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. The following land use codes (LUCs) were used:

- Residential – LUC 220 Apartments
- Retail/Commercial – LUC 820 Shopping Center

ITE's trip generation provides unadjusted vehicle trips assuming that all trips are vehicle trips. These unadjusted trips were converted to person trips using national vehicle occupancy rates. To account for local commuting trends in neighborhoods where alternatives modes of transportation are available, such as the Project site, local mode splits were then applied to the person trips.

Table 6-3 provides a summary of the local mode splits.

Table 6-3: Local Mode Split

Mode Choice	Residential	Retail
Vehicle	43%	56%
Walk/Bike/Other	36%	28%
Transit	21%	16%

Source: BTD, Area 17

The resulting project-generated vehicle, transit, and pedestrian and bicycle trip are shown in **Table 6-4**.

Table 6-4: Adjusted Trip Generation

Time of Day	Vehicle Trips	Walk/Bike Trips	Transit Trips
Daily Total	806	764	446
AM Peak Hour			
In	12	12	7
Out	46	44	25
Total	58	56	32
PM Peak Hour			
In	48	45	26
Out	27	26	15
Total	75	71	41

The Project is estimated to generate approximately 58 vehicle trips (12 entering and 46 exiting) during the morning peak hour and 75 vehicle trips (48 entering and 27 exiting) during the evening peak hour. In addition, the Project will generate approximately 56 walk/bike trips and 32 transit trips during the

morning peak hour. During the evening peak hour, the Project will generate approximately 71 walk/bike trips and 41 transit trips.

Project trips were distributed to the local street network using BTD's Area 17 guidelines and proportionately to the existing traffic on adjacent streets. Most project-generated traffic will travel to and from Cambridge Street. The Project trip distribution is illustrated in **Figure 6-8**, and project-generated trips can be found in **Figure 6-9**.

The 2022 Build Condition volumes are displayed in **Figure 6-10**. This condition includes traffic redistributed as part of the No Build infrastructure improvements planned as part of Boston Landing.

6.6.3 *Parking Supply*

This Project will provide 168 residential parking spaces in an above-grade automated parking garage. The automated parking garage provides a number of benefits to both the project and the community including reduced development footprint, increased open space, reduced energy and maintenance costs, reductions in fuel use and vehicle emissions and reduced vehicle theft and break ins. The garage will include charging stations for electric vehicles. This garage will have three bays to allow for off-street queuing and maneuvering ensuring that the adjacent streets are not impacted by the garage operations. Additionally, 12 surface parking spaces will be provided on Emery Road and along the existing driveway accessed from Rugg Road.

BTD's parking goals recommend a maximum of 0.75-1.25 parking spaces per unit for residential projects and 0.75-1.0 spaces per 1,000 sf for non-residential projects. The planned parking meets these guidelines by providing 0.64 spaces per unit, which will not exceed the recommended maximum parking ratios.

6.6.4 *Loading*

The Project includes an off-street loading and service area accessed from Emery Road. This includes an off-street compactor that will be shielded from the street. In addition, a second curbside trash pick-up will be provided on Emery Road.

Tenants that use moving vehicles will be required to obtain a street occupancy permit and load/unload from the street.

6.6.5 *Pedestrians and Bicycles*

Secure on-site bicycle storage will be provided for residents at a rate of 1 space per unit. This storage will include up to 261 bicycle spaces located in several dedicated areas at each of the buildings. In addition, additional spaces will be provided at-grade for visitors. These provisions are consistent with BTD's bicycle guidelines.

6.7 Intersection Operational Analysis

Traffic operations analyses were performed at study area intersections in accordance with the 2010 Highway Capacity Manual (HCM). LOS is a measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection. LOS designations range from 'A' to 'F', with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS D is typically considered acceptable. **Table 6-5** below presents the LOS delay threshold criteria as defined in the HCM.

Table 6-5: Level of Service (LOS) Criteria (Average Control Delay in Seconds)

Level of Service	Unsignalized Intersections	Signalized Intersections	General Description
A	0-10	≤ 10	Free Flow
B	> 10-15	> 10-20	Stable Flow (slight delays)
C	> 15-25	> 20-35	Stable flow (acceptable delays)
D	> 25-35	> 35-55	Tolerable delay, occasionally wait more than one cycle
E	> 35-50	> 55-80	Unstable flow
F	> 50	> 80	Considerable delay

Source: 2010 HCM

The resulting traffic operations for the Existing, No Build, and Build conditions are shown in **Tables 6-6** thru **6-8**.

Table 6-6: 2017 Existing Condition Level of Service Summary

	AM Peak Hour				PM Peak Hour			
	LOS	**Delay (secs)**	**v/c**	**95th% Queue (ft)**	**LOS**	**Delay (secs)**	**v/c**	**95th% Queue (ft)**
Cambridge Street/Hano Street (unsignalized)								
Cambridge EB left/thru	A	0.7	0.05	4	A	1.1	0.07	6
Cambridge WB thru/right	A	0	0.30	0	A	0	0.40	0
Hano Street SB left/right	C	17.2	0.13	11	C	16.9	0.11	9
Braintree Street/Penniman Street (unsignalized)								
Braintree EB thru/right	A	0	0.07	0	A	0	0.15	0
Braintree WB left/thru	A	0.6	0.01	0	A	1.6	0.02	1
Penniman NB left/right	A	9.6	0.06	4	B	10.7	0.05	4
Braintree Street/Rugg Road (unsignalized)								
Braintree EB thru/right	A	0	0.08	0	A	0	0.16	0
Braintree WB left/thru	A	0.3	0.00	0	A	0.8	0.01	1
Rugg Road NB left/right	A	9.7	0.07	5	B	11	0.07	6
Cambridge Street/Denby Street (Signalized)								
Overall Intersection	A	6.4	0.45	-	A	4.3	0.52	-
Cambridge EB left/thru	A	5.0	0.43	153	A	2.5	0.44	112
Cambridge WB thru/right	A	5.8	0.50	193	A	3.0	0.52	162
Denby SB left/right	D	37.6	0.15	44	D	53.1	0.51	57

v/c – volume-to-capacity ratio

Table 6-7: 2022 No Build Condition Level of Service

	AM Peak Hour				PM Peak Hour			
	LOS	**Delay (secs)**	**v/c**	**95th% Queue (ft)**	**LOS**	**Delay (secs)**	**v/c**	**95th% Queue (ft)**
Cambridge Street/Hano Street (unsignalized)								
Cambridge EB left/thru	A	0.8	0.05	4	A	1.1	0.09	8
Cambridge WB thru/right	A	0	0.26	0	A	0	0.30	0
Hano Street SB left/right	C	16.3	0.13	11	C	18.5	0.09	8
Braintree Street/Penniman Street (unsignalized)								
Braintree EB thru/right	A	0	0.11	0	A	0	0.32	0
Braintree WB left/thru	A	0.2	0.01	0	A	1.1	0.02	2
Penniman NB left/right	B	10.4	0.07	5	C	15.4	0.25	24
Braintree Street/Rugg Road (unsignalized)								
Braintree EB thru/right	A	0	0.00	0	A	0	0.00	0
Braintree WB left/thru	A	0.1	0.00	0	A	0.5	0.01	1
Rugg Road SB thru/right	B	10.8	0.04	3	C	16.3	0.04	3
Cambridge Street/Denby Street (Signalized)								
Overall Intersection	B	13.7	0.50	-	D	35.7	0.92	-
Cambridge EB left/thru	A	6.1	0.46	199	D	35.5	0.89	#706
Cambridge WB thru/right	A	4.4	0.30	100	B	15.0	0.46	208
Denby SB left/right	D	43.3	0.69	74	D	51.5	0.95	189

v/c – volume-to-capacity ratio

95th percentile volume exceeds capacity, queue may be longer

Table 6-8: 2022 Build Condition Level of Service

	AM Peak Hour				PM Peak Hour			
	LOS	**Delay (secs)**	**v/c**	**95th% Queue (ft)**	**LOS**	**Delay (secs)**	**v/c**	**95th% Queue (ft)**
Cambridge Street/Hano Street (unsignalized)								
Cambridge EB left/thru	A	1.4	0.05	4	A	2.6	0.10	9
Cambridge WB thru/right	A	0	0.26	0	A	0	0.30	0
Hano Street SB left/right	C	19.1	0.22	20	C	19.8	0.15	13
Braintree Street/Penniman Street (unsignalized)								
Braintree EB thru/right	A	0	0.11	0	A	0	0.32	0
Braintree WB left/thru	A	0.5	0.01	1	A	1.9	0.05	4
Penniman NB left/right	B	10.6	0.13	11	C	16.9	0.33	36
Braintree Street/Rugg Road (unsignalized)								
Braintree EB thru/right	A	0	0.00	0	A	0.1	0.00	0
Braintree WB left/thru	A	0.1	0.00	0	A	0.6	0.01	1
Rugg Road SB thru/right	B	14.8	0.04	3	C	17.2	0.04	3
Cambridge Street/Denby Street (Signalized)								
Overall Intersection	B	15.3	0.54	-	D	37.9	0.94	-
Cambridge EB left/thru	A	7.3	0.49	232	D	42.0	0.93	#734
Cambridge WB thru/right	A	5.1	0.31	111	B	16.2	0.48	220
Denby SB left/right	D	43.0	0.73	83	D	51.2	0.96	194

v/c – volume-to-capacity ratio

95th percentile volume exceeds capacity, queue may be longer

Under existing conditions, the study intersections operate at LOS C or better during the AM peak hour and LOS D or better during the PM peak hour. The No Build Condition results in the study intersections to operate at LOS D or better in both the AM and the PM peak hours. Under the Build Condition, all approaches continue to operate at LOS D or better.

6.8 Mitigation

The Project will enter a Transportation Access Plan Agreement (TAPA), a legally binding agreement, to finalize all transportation-related mitigation measures. A draft of these commitments is provided below.

6.8.1 *Transportation Demand Management*

The Project will encourage residents to seek out alternative modes of transportation by implementing a comprehensive Transportation Demand Management (TDM) plan. This plan may include measures such as:

- Dedicating a Transportation Coordinator to promote alternative modes of transportation and to oversee transportation operations at the Project site
- Charging market rates for parking separate from lease agreements
- Providing electric vehicle charging stations
- Providing bicycle parking at a 1:1 residential ratio up to 261 spaces
- Providing an on-site bicycle repair station
- Sponsoring a Hubway Station
- Providing loaner bicycles for residents and residential visitors
- Providing real-time transit information in the building's lobby
- Providing new residents with an informational package on alternative transportation measures available in the area such as car-sharing, ride-sharing, Hubway and MBTA services
- Providing new residents with a pre-loaded MBTA Charlie Card to encourage new tenants to become familiar with transit services in the area

The Project's commercial tenant will be encouraged, through lease language, to provide transit subsidies, on-site lockers, flexible employee schedules and other TDM measures.

In addition, the Project will join the Allston Brighton Transportation Management Association (TMA) which will provide additional services such as:

- Guaranteed Ride Home program
- Area-wide ride matching
- Car-sharing: Discounted ZipCar rates
- Transportation awareness events
- Transportation information and material
- Construction and transit advisories

6.8.2 *Pedestrian Realm Improvements*

The Project plans to reconstruct sidewalks adjacent to the site on Braintree Street, Rugg Road and Penniman Road to be ADA compliant. New accessible ramps and crosswalks will also be installed at the Braintree Street/Rugg Road and Braintree Street/Penniman Road intersections. All improvements will be coordinated with BTD and are subject to approval by the Public Improvement Commission (PIC).

6.8.3 *Construction Management Plan*

The Project will complete a Construction Management Plan (CMP) that will identify any construction-related impacts in the public-realm. This includes identifying potential sidewalk closures, truck routing, temporary changes to on-street parking, detours, and measures to encourage non-auto trips to the site by contractors during the construction phase. All measures are subject to approval by BTD prior to construction.

Figure 6-1: Study Area

Figure 6-2: Existing Conditions – Vehicles

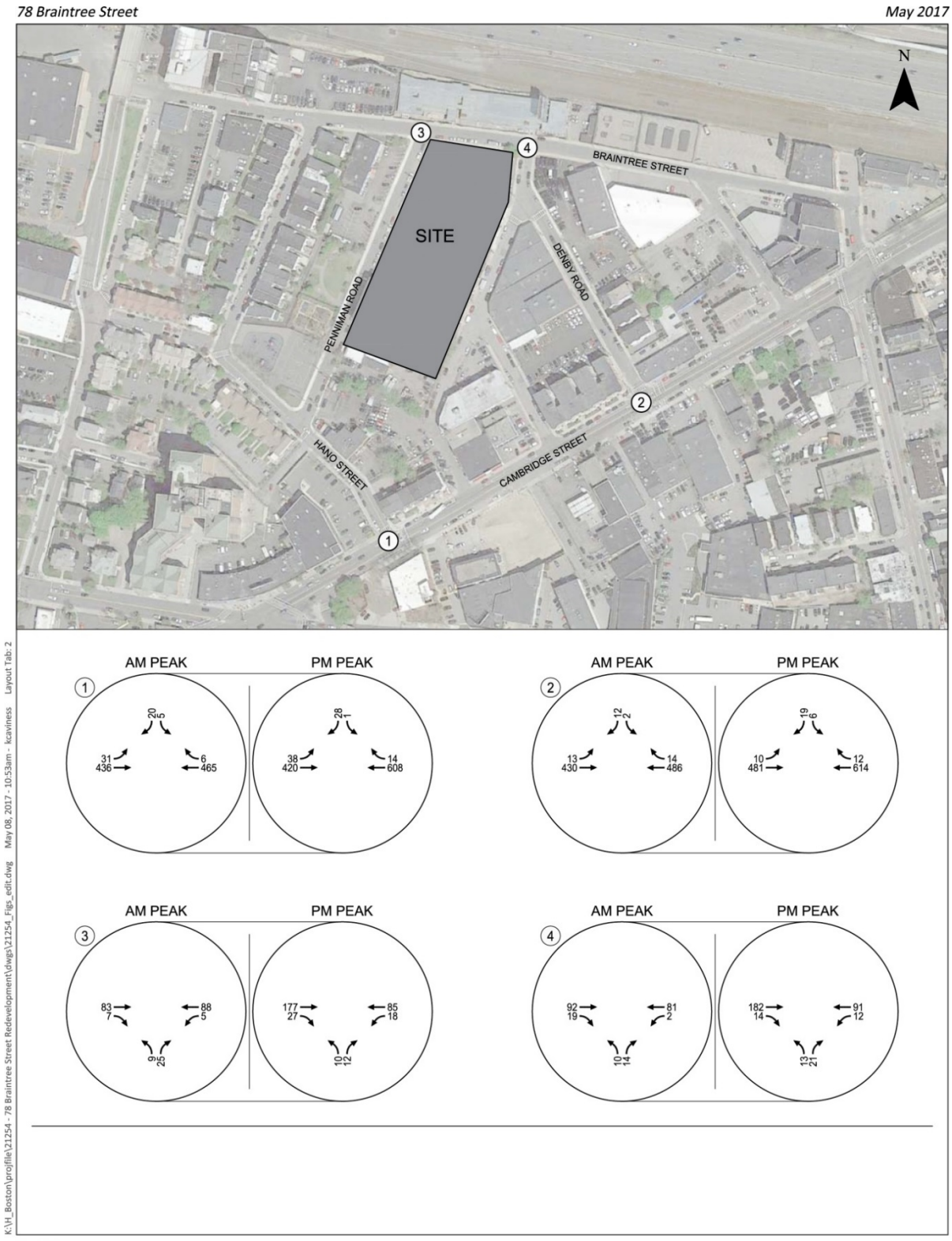


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Figure 6-3: Existing Condiitons – Pedestrians

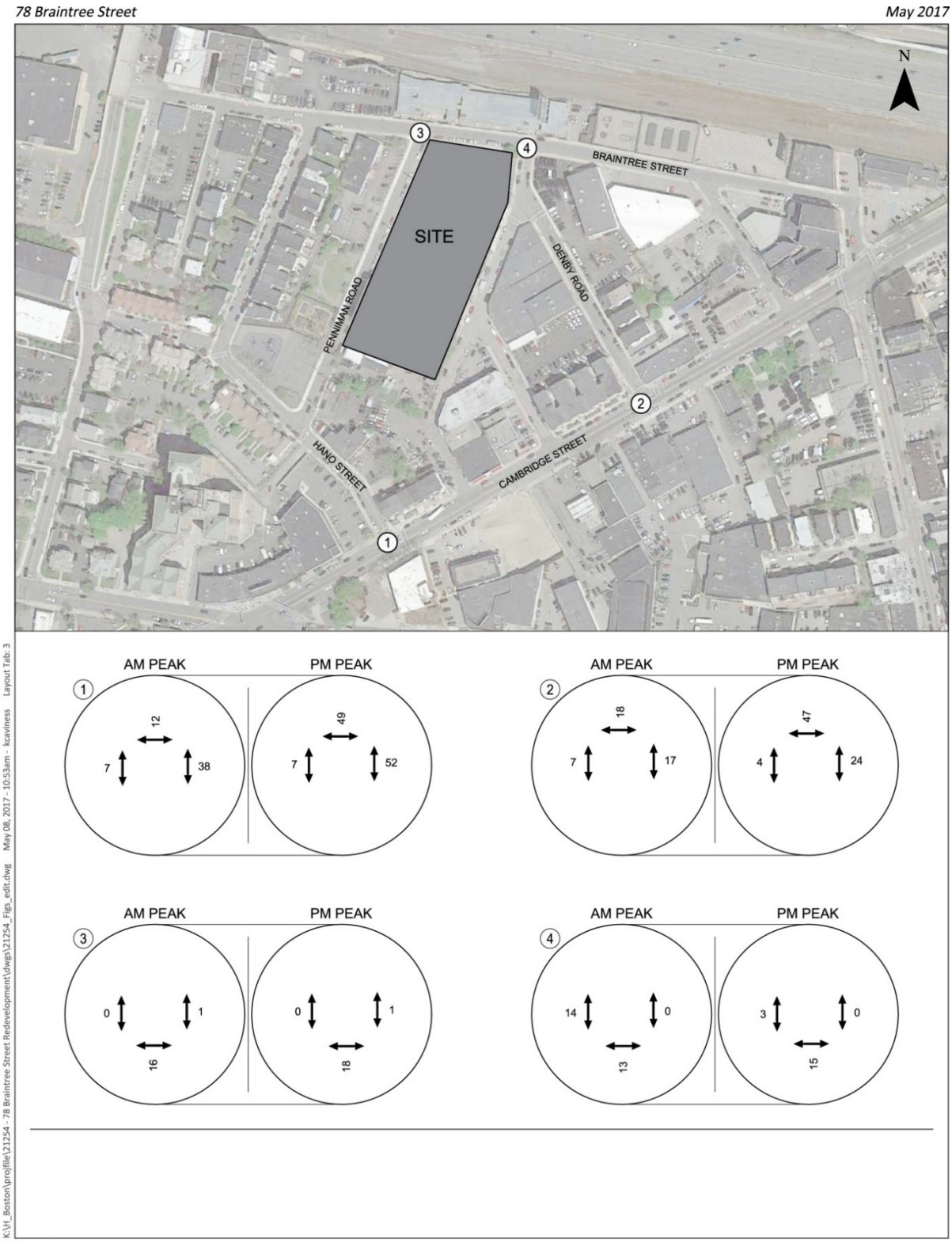

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Figure 6-4: Existing Condiitons – Bicycles

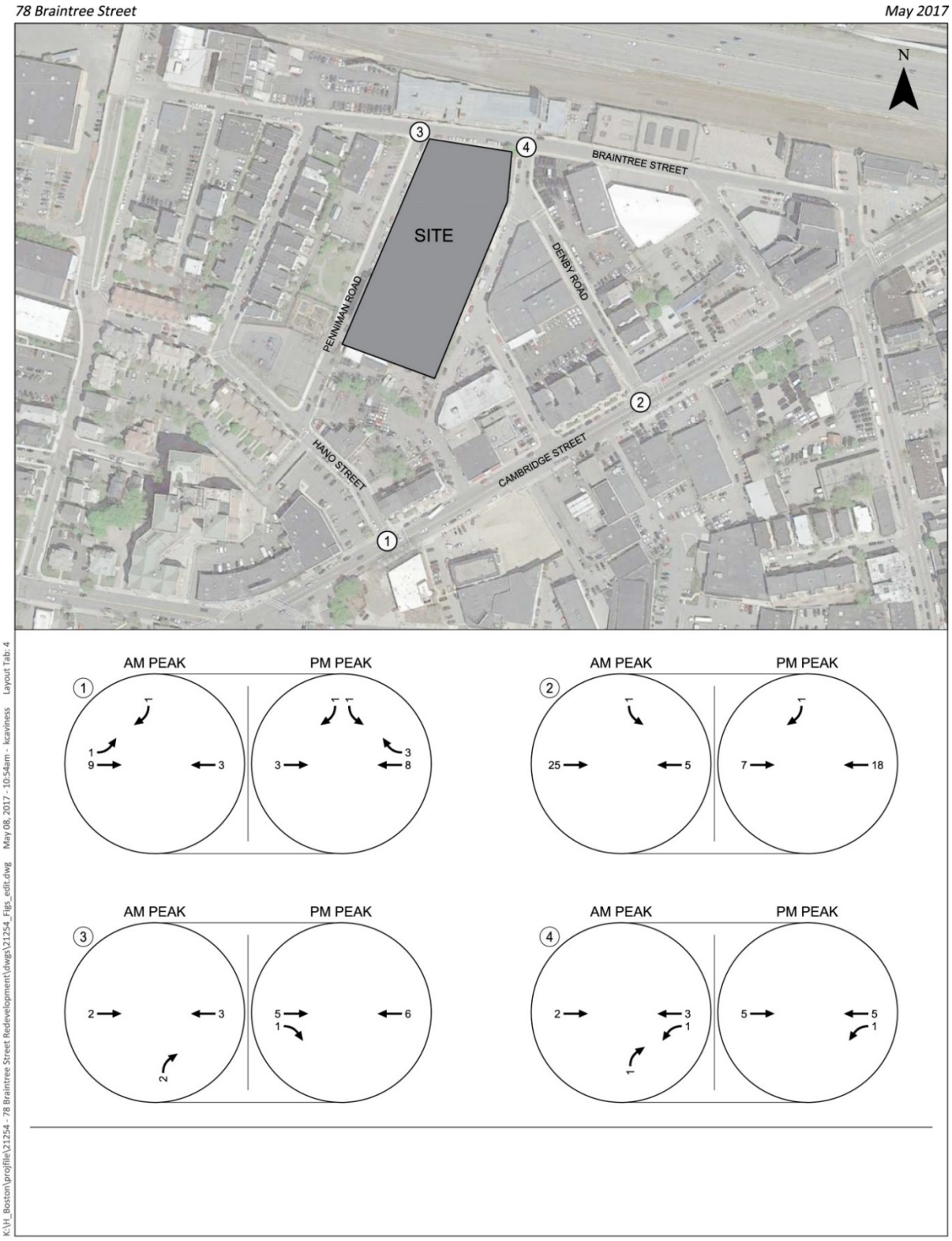

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Figure 6-5: MBTA Public Transportation Services

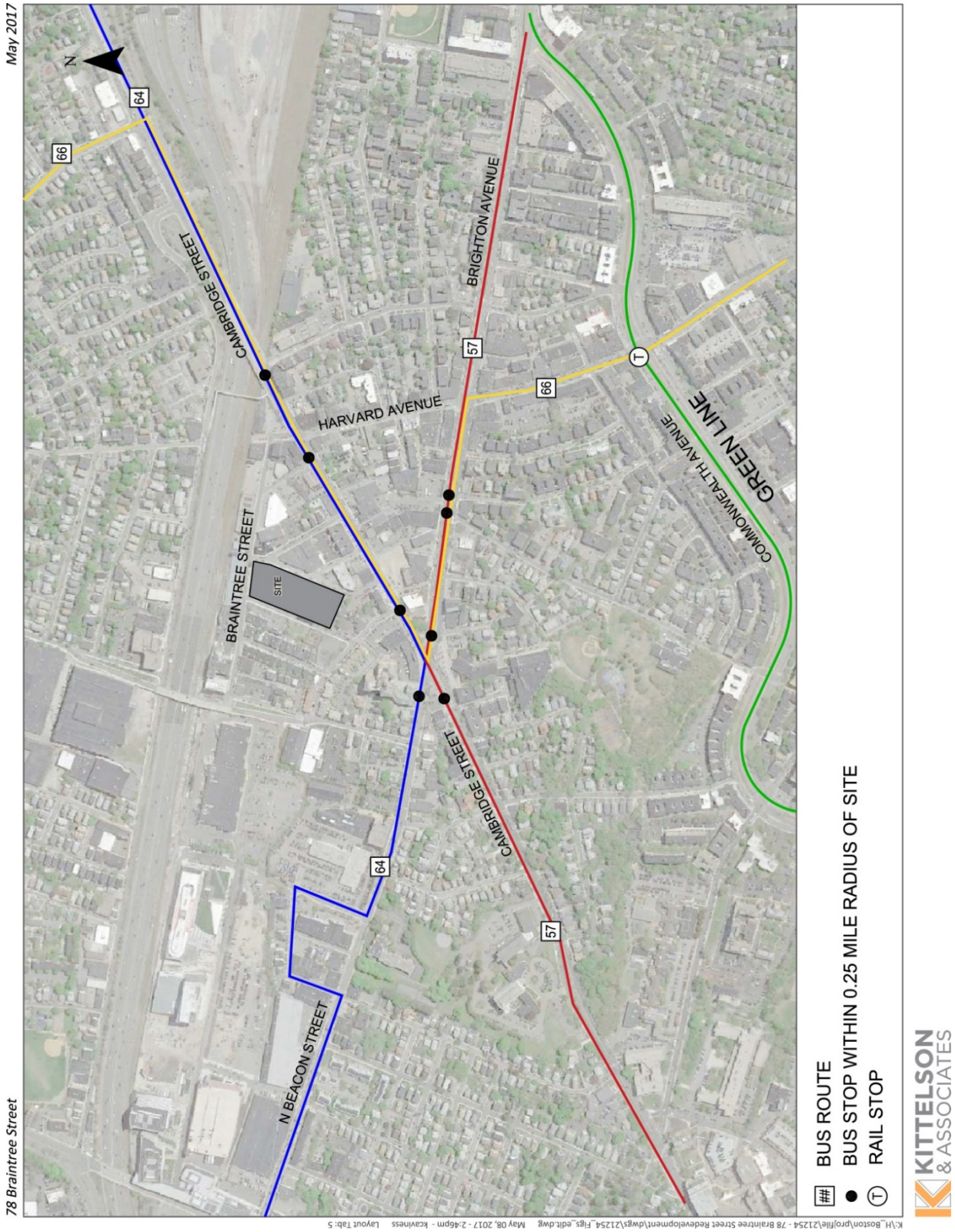

Figure 6-6: On-Street Parking Regulations

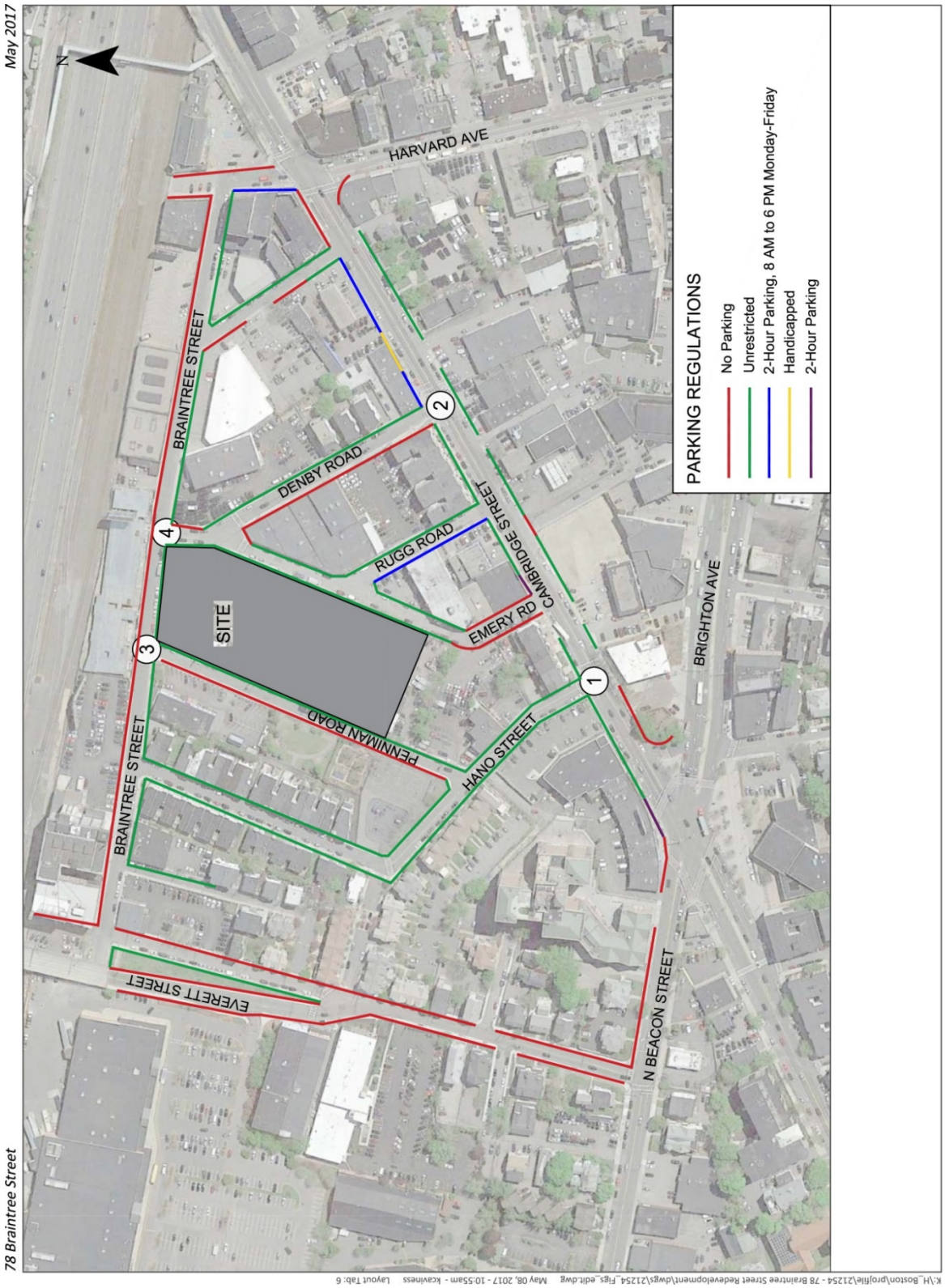

Figure 6-7: 2022 No-Build Conditions - Vehicles

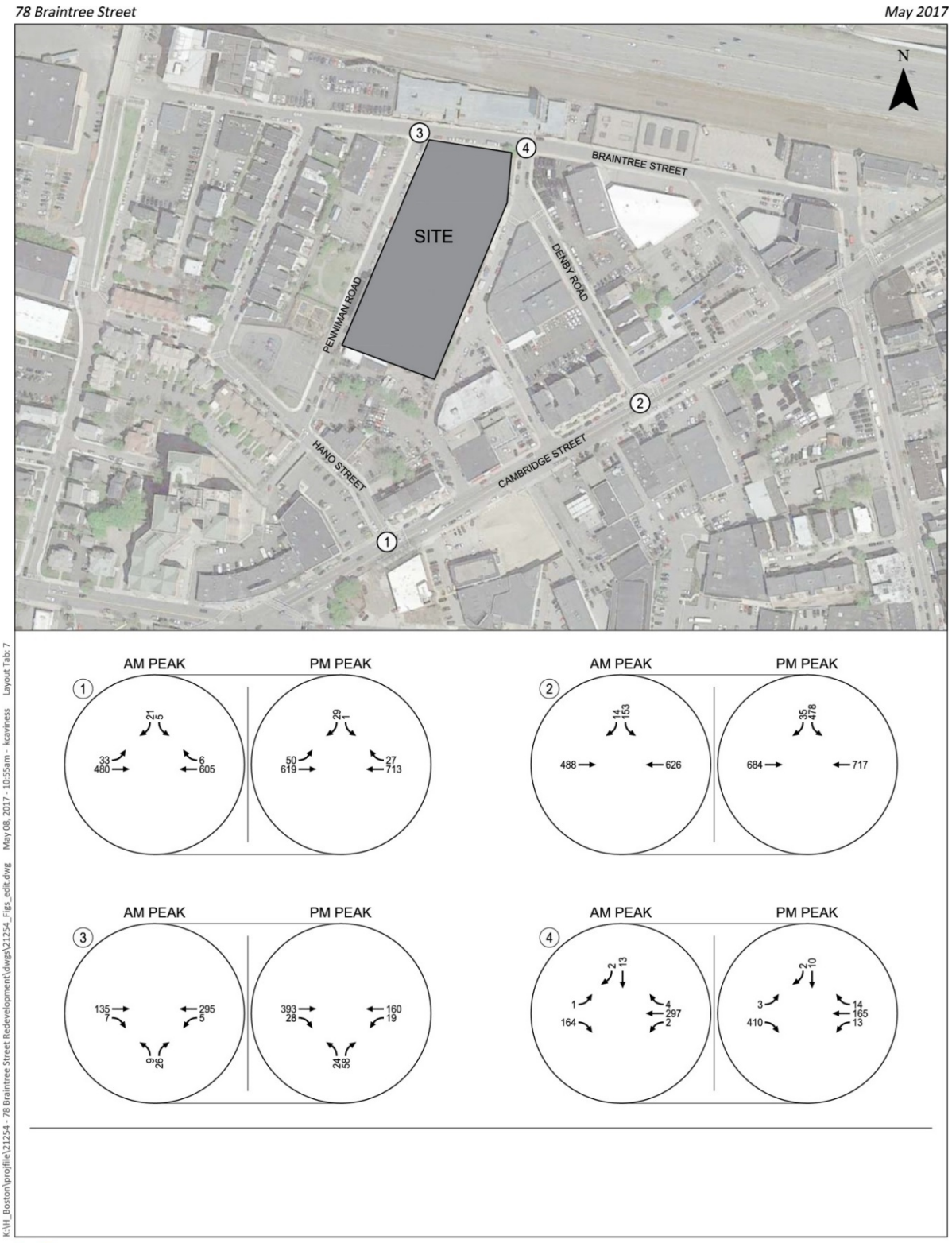

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Figure 6-8: Vehicle Trip Distribution

Figure 6-9: Project-Generated Trips (Vehicles)

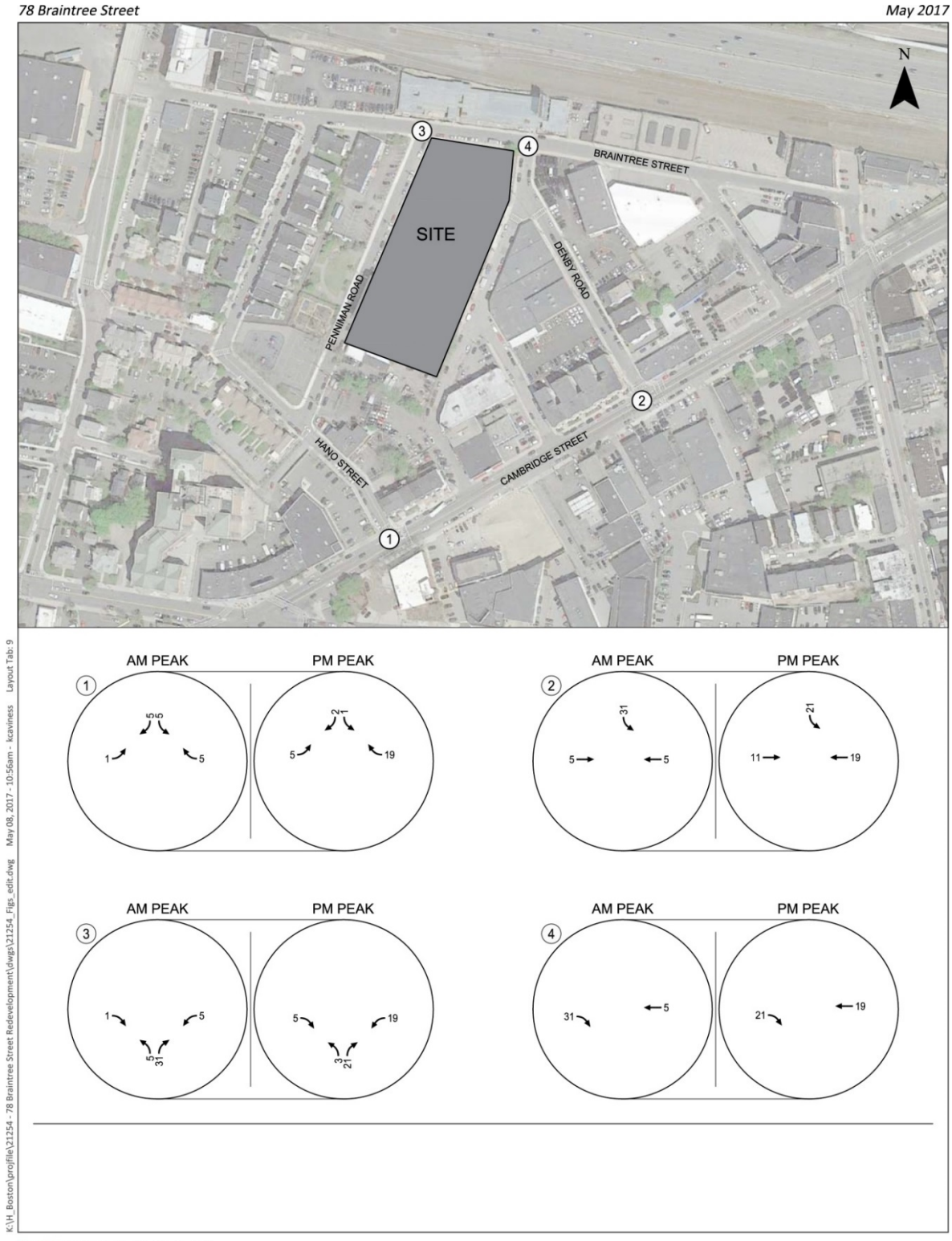

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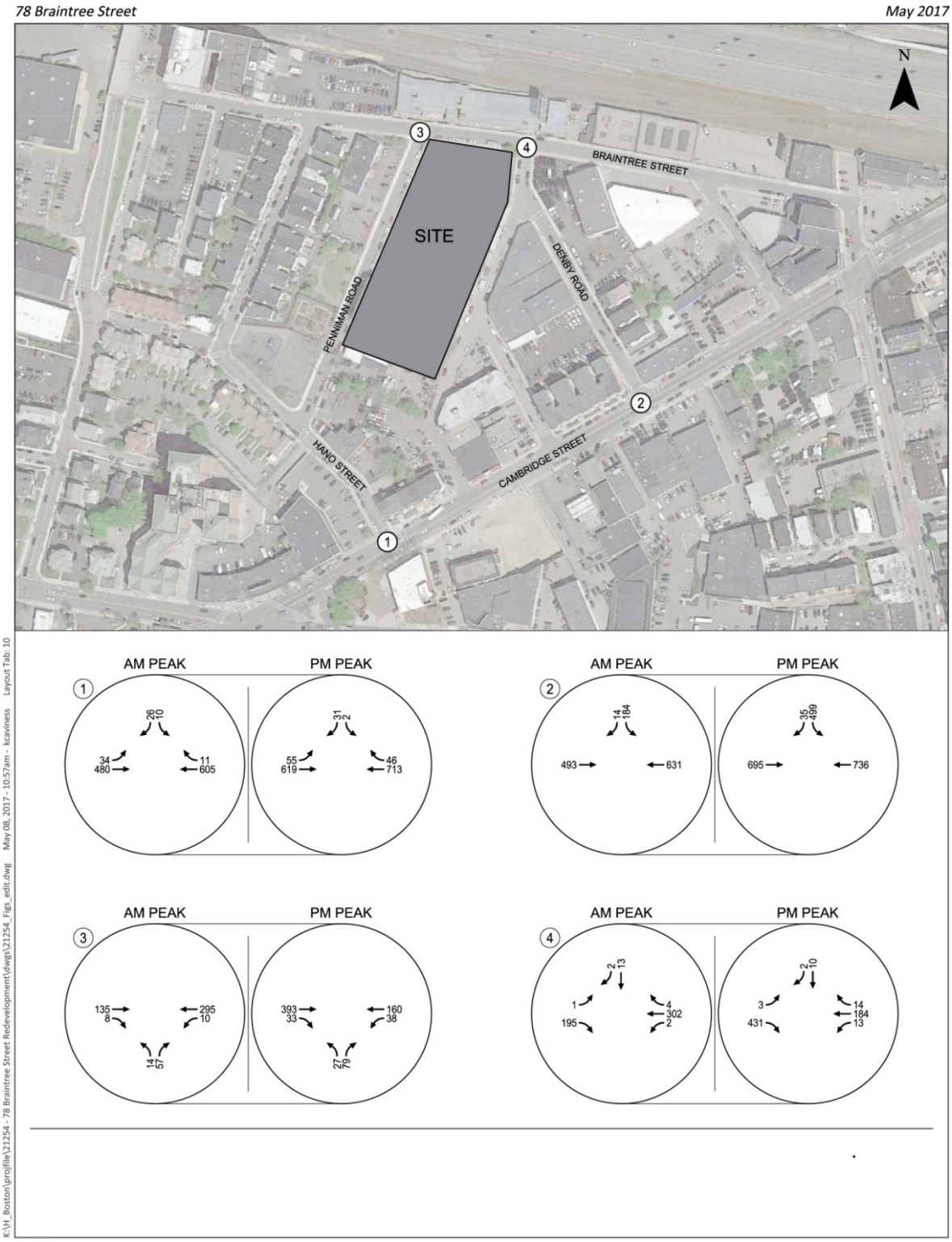
Figure 6-10: 2022 Build Conditions – Vehicles



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7.0 INFRASTRUCTURE SYSTEMS

7.1 Overview of Utility Services

The existing infrastructure surrounding the site of the Proposed Development is anticipated to have adequate capacity to service the Project needs. There is existing sanitary sewer, storm drainage, water, gas, electric, and telecommunications lines in the project vicinity. There is existing sewer, storm drainage, water and gas within Braintree Street, Penniman Road and Rugg Road. There are existing overhead electric and telecommunication lines along both Penniman Road and Rugg Road.

Prior to demolition, the Proponent will cut and cap all existing storm drain, sanitary sewer and water services that are not proposed for reuse on the Project site. A Termination Verification Approval Form for a Demolition Permit will be completed and submitted to the City of Boston Inspectional Services Department (ISD) as required. Similarly, private utility disconnects will be coordinated with the individual providers prior to building demolition.

Approval of Site Plans and a General Service Application are required from Boston Water and Sewer Commission (BWSC) for construction and activation of sewer, water, and storm drainage service connections. The final sewer and water connections, as well as the Project's stormwater management system, will be designed in conformance with BWSC's design standards, Requirements for Site Plans, Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains, and Regulations Governing the Use of the Water Distribution Facilities of the Boston Water and Sewer Commission.

A Drainage Discharge Permit Application will be submitted to BWSC for any required construction dewatering. The appropriate approvals from the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA) will also be sought.

7.2 Water System

7.2.1 *Existing Water Service*

BWSC owns, operates, and maintains the water distribution systems in the vicinity of the Project Site. Per BWSC GIS Maps there is an existing 8-inch cast iron low pressure main built in 1935 located within Rugg Road, a 10" low pressure main built in 2009 located within the western side of Penniman Road, and a 12" ductile iron cement-lined main built in 1997 located within the

northern side of Braintree Street. The extent of existing water distribution in the vicinity of the Project Site is shown on Figure 7-1 Existing Water Service Map.

All existing water services will be cut and capped prior to demolition, as required by BWSC. Existing hydrants will be removed and relocated in coordination with Boston Fire Department (BFD) service needs.

7.2.2 *Estimated Proposed Water Demand*

The estimated proposed water demand for the Project is based on the estimated sanitary sewer flow (see Table 7-1), with a factor of 1.1 applied to account for consumption and other losses. Based on this formula, the Project's estimated peak water demand for domestic uses is 41,833 -gallons per day. The domestic water will be supplied by the BWSC water system.

Based on discussions with BWSC, there are no expected water capacity issues in the vicinity of the Project Site. Prior to full design, this will be confirmed by flow testing by BWSC. The Project's engineer will coordinate water demand and availability with BWSC during Project design to ensure the Project needs are met while maintaining adequate water flows to the surrounding neighborhood.

7.2.3 *Proposed Water Service*

Per the latest architectural design it is anticipated that the domestic and fire protection services will connect to the 8" main in Rugg Road and the 10" main in Penniman Road. Final service locations will be coordinated with BWSC. Metering will be conducted in accordance with BWSC requirements including the installation of meter transmission units (MTU's) to comply with BWSC's automatic meter reading system. Appropriate gate valves and backflow prevention devices will also be installed on each water service to allow individual services to be shut off and to prevent potential backflow of non-potable water or other contaminants into the public water supply. See Figure 7-2 for proposed water service connections.

The Project is also expected to include multiple fire protection services. The size and location of these service connections will be coordinated between the Project's engineer and BWSC. Appropriate gate valves and backflow prevention devices will also be installed on each fire protection service to allow individual services to be shut off and to prevent potential backflow of non-potable water or other contaminants into the public water supply. It is assumed that the

Project will include internal booster pumps to ensure adequate water pressure to all standpipes and sprinkler systems.

At this point in the design it is not anticipated that additional fire hydrants will need to be proposed as there is an ample number of hydrants in the surrounding area. A site plan will be submitted to the Boston Fire Department to confirm the project site has adequate fire protection access and coverage.

Figure 7-1: Existing Water Service Map

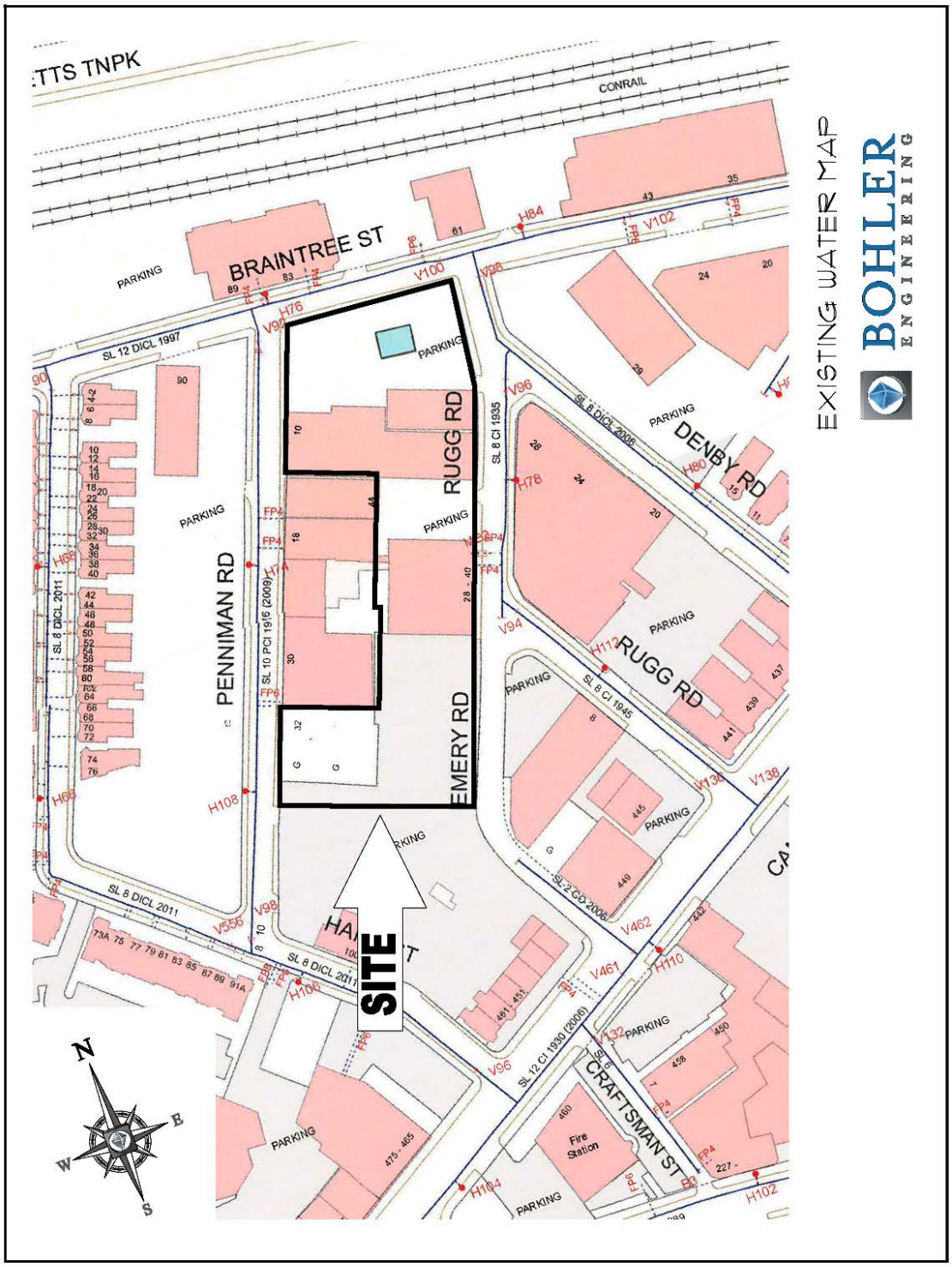
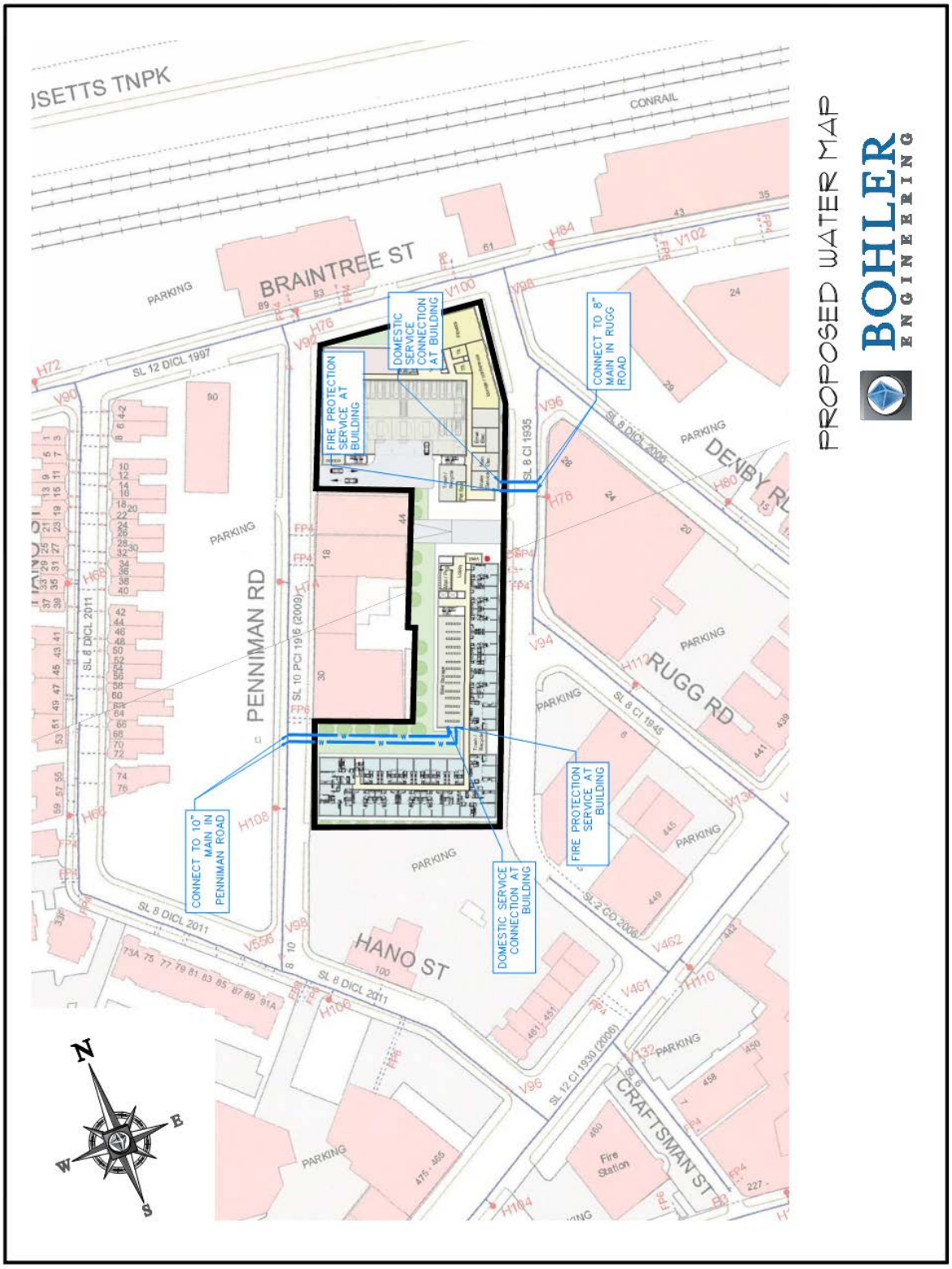


Figure 7-2: Proposed Water Map



7.2.4 *Water Supply Conservation and Mitigation*

The Project will be LEED certifiable in accordance with the BRA's Article 37 Green Building program. As such, various water conservation measures such as low-flow toilets and urinals, restricted flow faucets, and sensor operated sinks, toilets, and urinals may be incorporated in order to meet the LEED water conservation requirements. Specific water conservation measures to be included in the Project will be more fully described as the building designs develop.

7.3 Sanitary Sewer System

7.3.1 *Existing Sanitary Sewer System*

BWSC owns, operates, and maintains the sanitary sewer mains in the vicinity of the Project Site.

The extent of existing sanitary sewer distribution in the vicinity of the Project Site is shown in red on Figure 7-4 Existing Sewer and Drain Map. Per the latest BWSC GIS mapping there is a separated 12-inch main within Rugg Road, a separated 12" main along the western side of Penniman Road, and a separated 15" main within Braintree Street.

All existing sanitary sewer services will be cut and capped prior to demolition, as required by BWSC.

7.3.2 *Estimated Proposed Sanitary Flow*

The Massachusetts Department of Environmental Protection (MassDEP) establishes sewer generation rates for various types of establishments in a section of the State Environmental Code Title 5 (Title 5), 310 CMR 15.203. Based on an estimate of the Project's building program, Table 7-1 gives the estimated proposed sanitary sewer flows expected to be generated by the Project. Based on these Title V sewer generation rates, the project is expected to produce approximately 38,030-gallons/day of sewer flow. The proposed sewer generation calculation will be refined as the building tenants are confirmed and final sewer generation flows will be coordinated with BWSC.

Table 7-1: Sewer Generation

Unit Type	Program	Sewer Generation Rate	Sewer Flow (gpd)
Multifamily (Residential)	261 units, 323 beds	110 gallons/day/bedroom	35,530
Fast Casual Restaurant	125 seats	20 gallons/day/seat	2,500
Parking Garage	168 spaces	-	-
Total Sewer Generation			**38,030**

Based on preliminary calculations and discussions with BWSC, there are no sewer capacity problems in the vicinity of the Project Site. The Project's engineer will coordinate final, proposed sewer flows and available capacity with BWSC during Project design to ensure the Project needs are met without disruption of service to the surrounding area.

7.3.3 *Proposed Sanitary Sewer Connections*

Service connections are anticipated to occur in Rugg Road and Penniman Road where there are separated 12" sanitary sewer mains. The size and location of these service connections will be coordinated between the Project's plumbing engineer and the BWSC. Floor drains from the covered levels of the parking garage will be collected and routed through an approved oil/grease separator prior to discharge into the sanitary sewer system.

All sewer connections will be constructed so as to minimize effects on adjacent streets, sidewalks, and other areas within the public right-of-way. All sewer service connections will be kept separate from storm drain connections in accordance with BWSC requirements. Per current BWSC records, it appears that all storm and sewer drains within Braintree Street, Rugg Road, and Penniman Road are separated. See Figure 7-3 for proposed sanitary sewer service connections.

Figure 7-3: Proposed Sewer Map

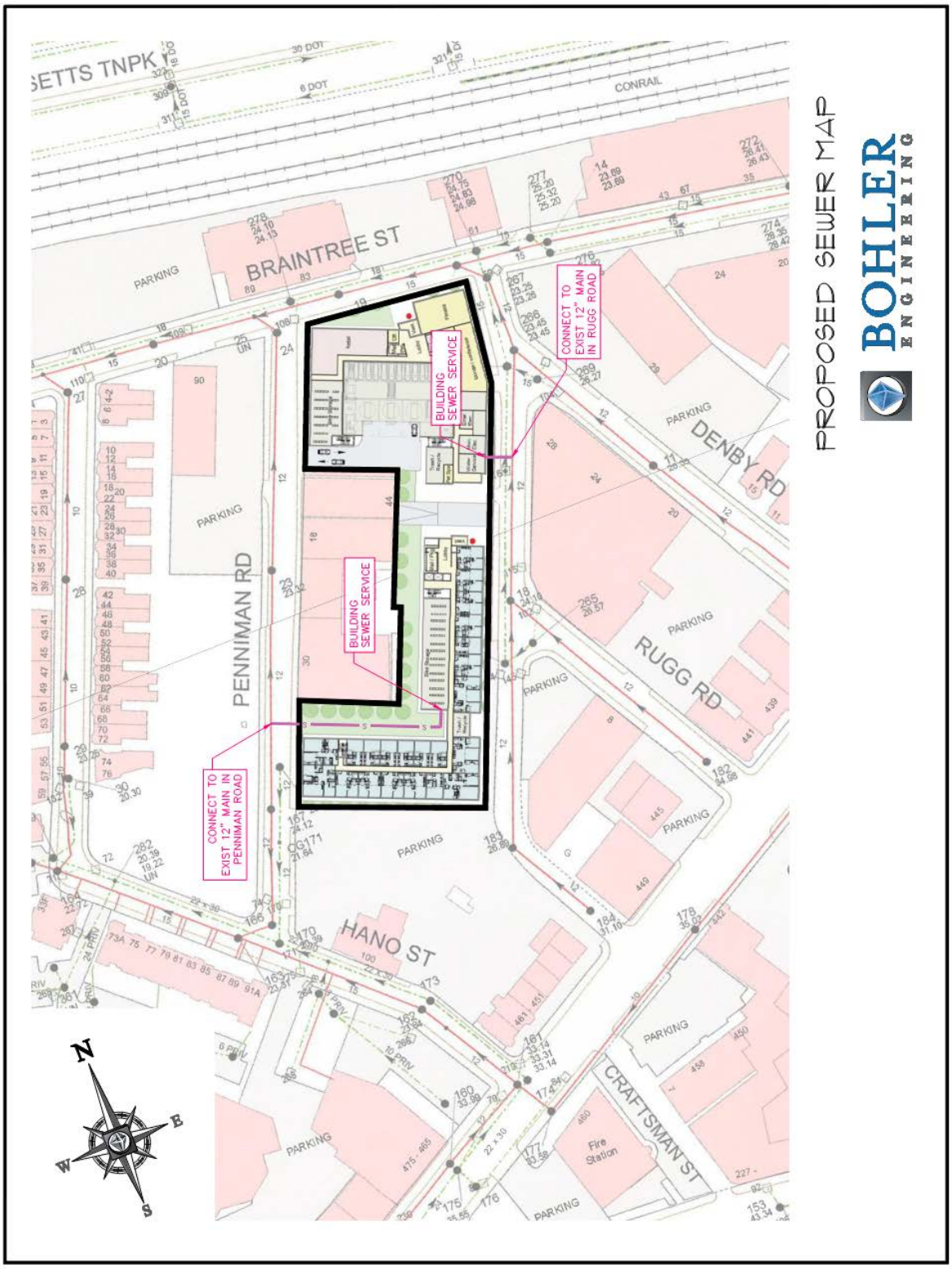
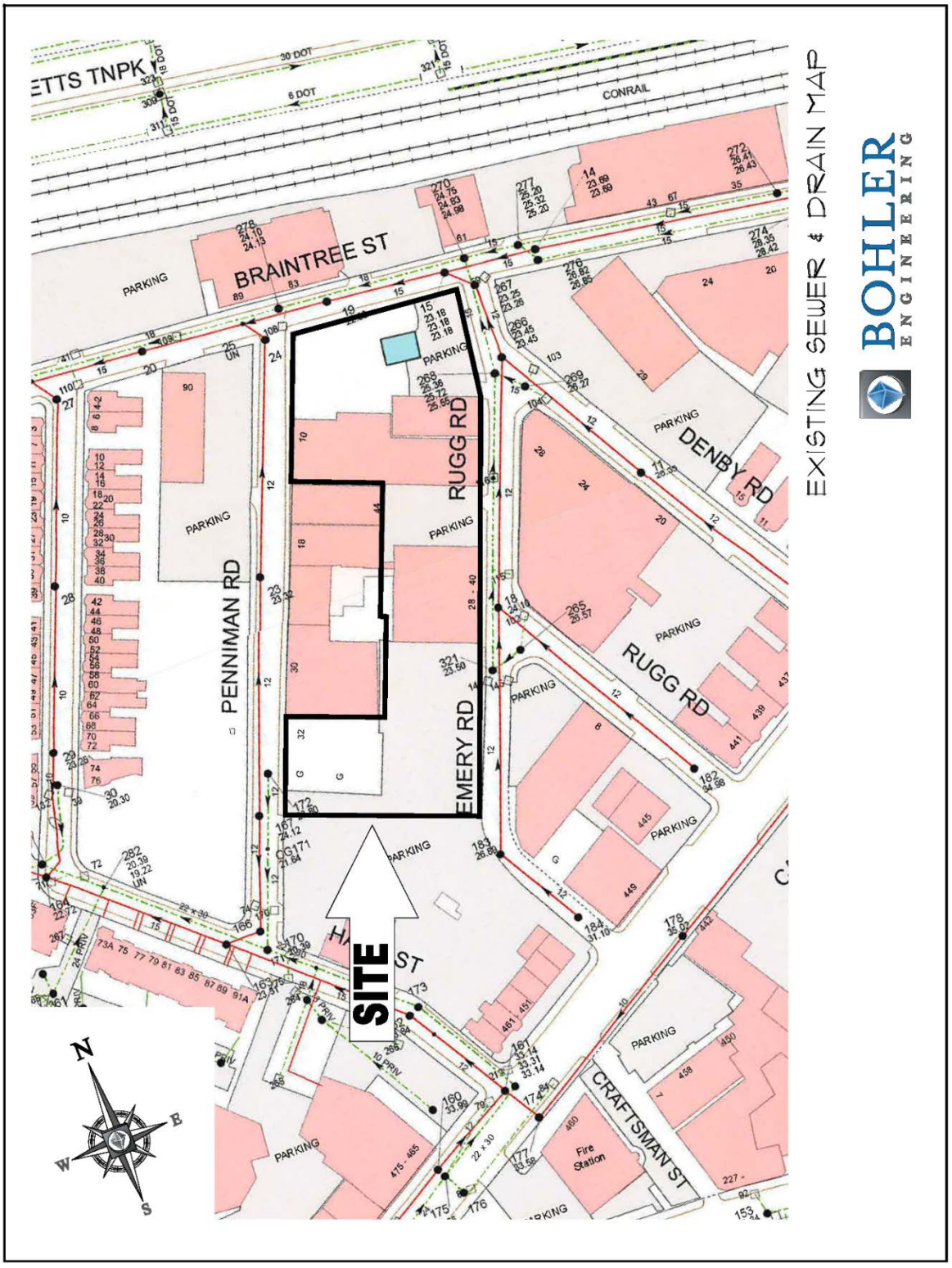


Figure 7-4: Existing Sewer and Drain Map



7.3.4 *Sewer System Mitigation*

The sanitary sewer connections are subject to approval by the municipal sewer system owner, BWSC, as part of the Site Plan approval process. As part of the project mitigation, the Project will need to mitigate inflow and infiltration (I/I) into the BWSC sewer system, and ultimately the MWRA regional wastewater system, at a rate of 4-gallons for every 1-gallon of new sewer flow. Currently, the BWSC calculates the monetary amount required to fulfill the 4:1 Inflow Reduction requirement by multiplying the estimated wastewater flow by 4 and then by $2.41. The proponent will continue to work with BWSC as the building program is finalized to identify the I/I payment to be made.

Additionally, as stated in the Water Supply Conservation and Mitigation Section, various measures for water use reduction, which translates directly into wastewater reduction, are being implemented into the design which will also benefit the overall goal of reducing the volume of flows being sent to the MWRA wastewater treatment facility.

7.4 Storm Drainage System

7.4.1 *Existing Storm Drainage System*

The existing Project Site is currently occupied by five buildings, including associated parking areas, sidewalks, asphalt, pavement, various utilities and landscaping. Runoff from the site currently runs to the existing drainage infrastructure within Braintree Street, Rugg Road, and Penniman Road.

Any existing storm drainage services will be cut and capped prior to demolition of existing structures, as required by BWSC. See Figure 7-4 for existing drainage infrastructure.

7.4.2 *Proposed Storm Drainage System*

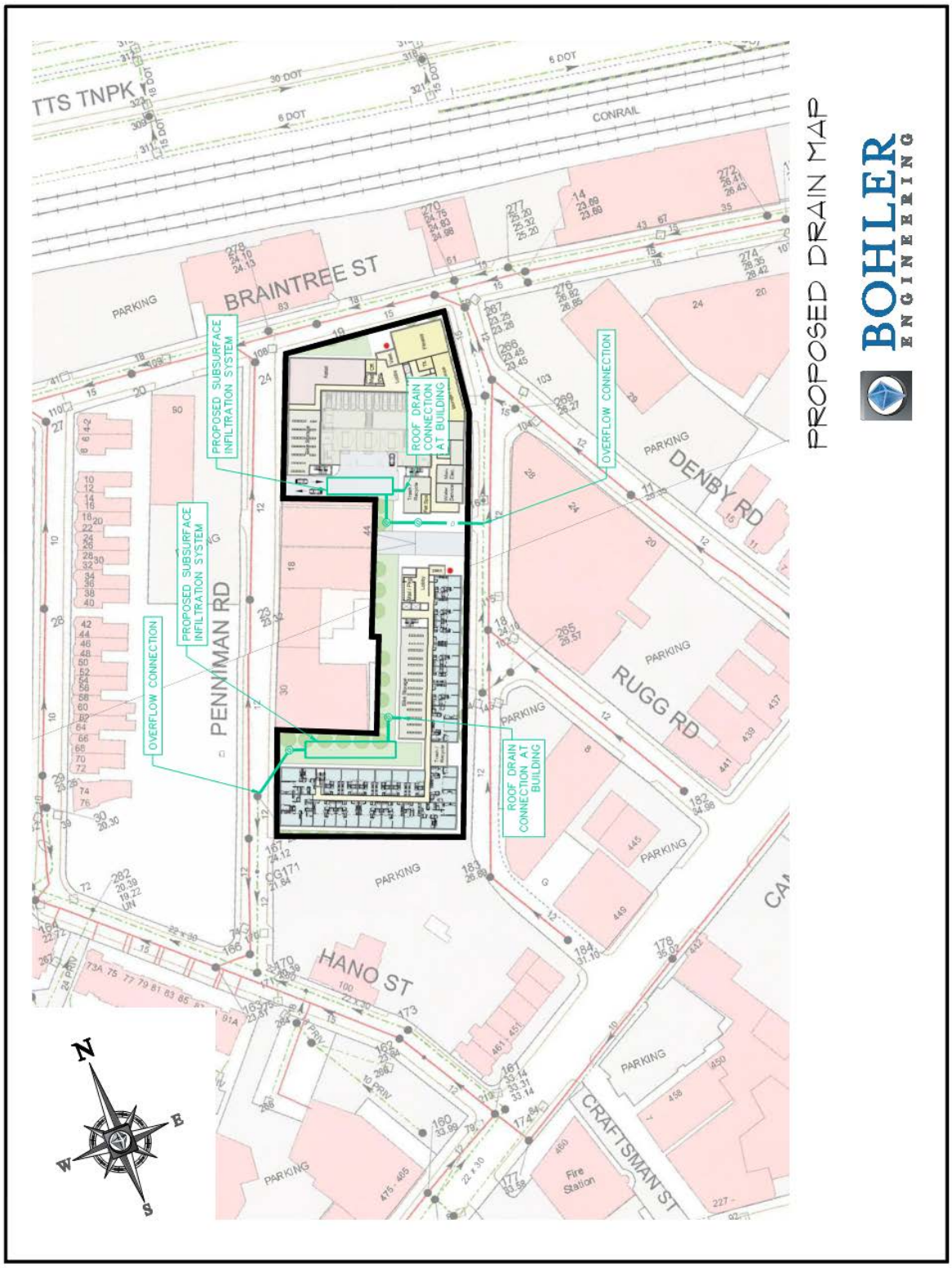
The proposed stormwater management system will be designed to comply with BWSC requirements. Based on preliminary on-site geotechnical and geoenvironmental investigations and studies, it is anticipated that stormwater runoff will be collected and treated on-site, as necessary, and will be routed to subsurface infiltration systems in an effort to reduce the impact on the BWSC drainage system. At a minimum, on-site systems will be designed with a capacity of 1-inch over the Project site. For larger storms, these systems will be equipped

with overflow connections to the municipal system. Appropriate stormwater best management practices (BMP's) are to be included in the project to improve the quality of stormwater runoff discharged from the Project Site, to promote infiltration to groundwater, and to ensure peak flows are at or below existing levels. Overflow connections from the underground infiltration/detention areas are proposed to handle larger, less frequent storm events and will discharge to the BWSC drain system. See Figure 7-5 for a schematic design of the proposed storm drainage connection points and underground stormwater infiltration/detention systems. A long term operations and maintenance plan will be used to assist the Property Manager in maintaining the stormwater BMP's in appropriate operational condition.

The project site is located within the Charles River watershed and will be required to meet the phosphorus TMDL reduction standards. The drainage design will incorporate proprietary structure measures to mitigate phosphorous levels in accordance with these standards.

Since the Project will disturb more than one acre of land, construction will require the submittal of a Notice of Intent (NOI) for coverage under the Construction General Permit (CGP) as part of the Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES). Conformance with NPDES will require the preparation of a Stormwater Pollution Prevention Plan (SWPPP) for the Project's construction and performance of applicable SWPPP Site inspections. As part of conformance with the SWPPP and NPDES, appropriate erosion and sedimentation (E&S) controls will be installed to prevent sediment laden stormwater runoff from leaving the Site and entering the BWSC drainage system. E&S controls may include structural methods such as catch basin inlet controls, hay bales, silt fence, and silt socks as well as non-structural methods such as minimizing the extent and duration of exposed soils. E&S controls will be maintained as necessary until all disturbed areas have been stabilized through the placement of pavement, structure, or established vegetative cover and will conform to the Water Quality section of the City of Boston Environment Department Guidelines for Construction.

Figure 7-5: Proposed Drain Map



7.5 Energy and Telecommunications

Eversource owns and maintains the electrical infrastrucure within the Project site's general vacinity. Existing above ground electric lines are located within Rugg Road and Penniman Road. All energy and telecommunications connections will be coordinated with the appropriate utility companies and the City of Boston. Final service and appropriate connection points will be coordinated with Eversource as the Project design progresses.

7.6 Natural Gas System

National Grid provides natural gas service in the Project area. There are two 8-inch low pressure gas mains located in Penniman Road, an 8" low pressure gas main in Braintree Street and a 2" low pressure gas main in Rugg Road. Final service and appropriate connection points will be coordinated with National Grid as the Project design progresses.

7.7 Utility Protection During Construction

The contractor will notify utility companies and call "Dig-Safe" prior to excavation. During construction, infrastructure will be protected using sheeting and shoring, temporary relocations and construction staging as required. The construction contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of all utilities with the appropriate utility owners and/or agencies. The construction contractor will also be required to provide adequate notification to the utility owner prior to any work commencing on their utility. Also, in the event a utility cannot be maintained in service during switch over to a temporary or permanent system, the construction contractor will be required to coordinate the shutdown with the utility owners and Project abutters to minimize impacts and inconveniences. The Proponent will continue to work with BWSC and utility companies to ensure safe and coordinated utility operations in connection with the Project.

7.8 Existing Conditions Survey

In order to better understand the existing conditions and infrastructure on and immediately adjacent to the Project Site, a topographic survey and perimeter survey was performed. The Existing Conditions Plan can be seen on Figure 2-1.

APPENDIX 1

ACCESSIBILITY CHECKLIST

Article 80 – Accessibility Checklist

A requirement of the Boston Planning & Development Agency (BPDA)
Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

1. ***Accessible Route*** – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. ***Accessible Group 2 Units*** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. ***Accessible Guestrooms*** – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. ***Inclusionary Development Policy (IDP)*** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. ***Public Improvement Commission (PIC)*** – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. ***Visitability*** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

1. Project Information:

If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.

Project Name:	**40 Rugg Road Mixed-Use Development**
Primary Project Address:	**28-32 & 40 Rugg Road, 76-78 Braintree Street, 10-10R & 38-40 Penniman Road, Boston MA 02134**
Total Number of Phases/Buildings:	**1 Phase Consisting of 2 Buildings**
Primary Contact (Name / Title / Company / Email / Phone):	**Kristina Vagen /Vice President / The Michaels Organization / kvagen@tmo.com / (856)-597-8957**
Owner / Developer:	**(Same as above)**
Architect:	**DiMella Shaffer**
Civil Engineer:	**Bohler Engineering**
Landscape Architect:	**Bohler Engineering**
Permitting:	**Bohler Engineering**
Construction Management:	**TBD**

At what stage is the project at time of this questionnaire? Select below:

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
BPDA Design Approved	Under Construction	Construction Completed:

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	**Variances through the MAAB are not anticipated at this time.**

2. Building Classification and Description:

This section identifies preliminary construction information about the project including size and uses.

What are the dimensions of the project?

Site Area:	*82,325± SF*	Building Area:		*Residential/Retail 191,000± SF Parking 46,300± SF*
Building Height:	*69FT.*	Number of Stories:		*6 Flrs.*
First Floor Elevation:	**Build C 33.0 Elev. Build A+B 32.0 Elev**	Is there below grade space:		*Yes / **No***
What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	Steel Frame	**Concrete**
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	**Residential - Multi-unit, Four +**	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	***Retail/ Restaurant, Residential Lobby and Amenity Spaces***			

3. Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	**The proposed mixed-use development is aimed to provide residential and retail amenities to the surrounding area. The proposed project is located in the Boston neighborhood of Allston on approximately 1.9 acres of existing land currently occupied by aging industrial, buildings, vacant space and underutilized parking lots. The existing site topography is generally flat and ranges from elevation 31-feet to 36-feet (Boston City Base). The project is bounded by Penniman Road to the West, Braintree Street to the North, Rugg Road to the East and existing industrial buildings to the South.**
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	**Harvard Ave MBTA Station (Subway) (0.5 miles) Packards Corner MBTA Station (Subway) (0.65 miles) Bus Routes on Cambridge Street: #64, 66, 501, 503 (0.25 miles) Boston Landing Station (Framingham–Worcester Commuter Rail) (0.25 miles)**
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	**Arbour HRI Hopsital, Brigham and Women's Hospital, Franciscan Children's Hospital, SMG Brookline Women's Health, Boston Housing Authority, St. Joseph Preparatory High School, Jackson/Mann K-8 School**

List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	**Jackson Mann Community Center, Allston Brighton Community Development Corporation, Faneuil Gardens Community Center**
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? ***If yes,*** identify which district:	**Development site is not in a Historic District.**
Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	**Yes, sidewalk and pedestrian ramp material is cement concrete of varying widths and are in fair to good condition. A detailed survey of existing pedestrian ramp dimensions and slopes has not been performed as the existing sidewalks are to be reconstructed surrounding the project site.**
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	**No, the existing sidewalks and pedestrian rams adjacent to the project will be reconstructed as a part of the construction process. All proposed sidewalks and pedestrian ramps will be built in compliance to City of Boston, ADA and MAAB standards.**
5. Surrounding Site Conditions – Proposed *This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.*	
Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	**Yes, the proposed sidewalks will be constructed to be consistent with the Boston Complete Street Standards.** **Penniman Street - Neighborhood Residential/ Industrial** **Rugg Road – Neighborhood Residential/ Industrial** **Braintree Street – Neighborhood Connector**
What are the total dimensions and slopes of the proposed sidewalks?	**Proposed walks will match existing widths and provide a minimum of 5' clear width for pedestrian travel per BCS Standards.**

List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	**Neighborhood Residential/ Industrial – Pedestrian Zone (5' min.), Furnishing Zone (1'-6" min.)** **Neighborhood Connector - Pedestrian Zone (5' min.), Furnishing Zone (1'-6" min.)**
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	**Sidewalks and pedestrian ramps will be within the City right of way and constructed with cement concrete.**
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	**No sidewalk cafes or furnishings are programmed for the pedestrian right-of-way at this time.**
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	**Yes, if the Proponent proposed a design that requires a pedestrian easement the Proponent will seek an easement through the PIC, however, a pedestrian easement is not anticipated at this time.**
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	**No, it is anticipated at this time that the project will be replacing the cement concrete sidewalks within the right of way in kind. The Proponent will apply for a curb cut permit through DPW.**
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*.	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	**168 Parking spaces will be provided in the proposed automated parking garage.**
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle?	**All parking bays within the automated parking garage are designed to be accessible.** **2 Van accessible spaces will be provided along the shared access drive aisle located off Rugg Road.**

Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	**On-street accessible spaces are not anticipated at this time.**
Where is the accessible visitor parking located?	**Accessible visitor parking is located within the proposed parking garage.**
Has a drop-off area been identified? ***If yes,*** will it be accessible?	**Accessible visitor parking/drop off area is anticipated to be located in the shared access drive aisle located off Rugg Road.**
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors*.	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	**All entryways and thresholds will be accessible – flush or within acceptable change restrictions.**
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no****,* what is the reason?	**Yes, accessible entrances and standard entrances will be integrated.**
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	**An accessible routes way-finding and sign package will be developed and provided as the design progresses.**
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	**261 Units**
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	**All units are for rent. 225 – Market Rate. 34 – Affordable (13%)**

If a residential development, how many accessible Group 2 units are being proposed?	14 Units at 5% (three 2-bedrooms, five 1-bedrooms, five – studios)
If a residential development, how many accessible Group 2 units will also be IDP units? *If none*, describe reason.	2 Units at 14% of accessible Group 2 units.
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? *If yes,* provide amount and location of equipment.	N/A
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. *If yes*, provide reason.	No.
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? *If yes*, describe:	Yes, interior elevators and ramps will provide access to separate floors. All ramps and elevators will be designed to meet ADA and MAAB standards.
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.*	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	The Proponent is committed to constructing new pedestrian sidewalks and pedestrian ramps within the City right of way in compliance with Boston Complete Street Standards.

What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	**All indoor and outdoor amenity space and common areas will be accessible.**
Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? ***If no***, explain why not.	**ADA compliant restrooms will be provided at Building C ground floor, adjacent to the Lounge and Fitness Center, and at Level 5, adjacent to the rooftop amenity space.**
Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments?	**Yes, the Proponents representatives met with the Mayor's Commission for Persons with Disabilities staff prior to the filing of the PNF. The staff was in general approval with the Proposed plan.**
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible?	**The Proponent has not presented to the Disability Advisory Board.**

10. Attachments

Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. **See attached.**

Provide a diagram of the accessible route connections through the site, including distances. **See attached.**

Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) **See attached.**
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. **Specific locations of accessible units will be confirmed as the design progresses.**
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. • • • •

This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682

APPENDIX 2

CLIMATE CHANGE RESILIENCY PREPARDNESS CHECKLIST

Climate Change Preparedness and Resiliency Checklist
Performance Criteria

The Climate Change Preparedness and Resiliency Policy, enacted in 2013, requires that all projects subject to Boston Zoning Code Article 80B, Large Project Review, complete a Climate Change Preparedness and Resiliency Checklist (Resiliency Checklist). The Resiliency Checklist provides a framework for considering present and future climate conditions in assessing projects' environmental impacts including building passive survivability, long-term integrity, and the safety of inhabitants. It also offers context for describing actions to mitigate adverse impacts.

The following guidance is provided to assist development teams in project planning and in completing the Resiliency Checklist. This guidance will be updated to reflect the most current climate change information, research, and practices.

Resiliency Checklist, Section B - Extreme Weather and Heat Events

What is the full expected life of the project?
What time span of future Climate Conditions was considered?

> The "full expected life" refers to the project's likely physical longevity. The full expected life for a large building in Boston is at least 60 years. The "span of future Climate Conditions" and related analyses should similarly extend at least 60 years and as long as the full expected life of the project. Proponents may present a case for considering a different lifespan.

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

> The City of Boston defines three types of high-heat events:
>
> - Heat Advisory: temperature is over 86 degrees F and humidity is greater than 68%
> - Heat Wave/Heat Alert: Three consecutive days with temperatures over 90 degrees F
> - Heat Emergency: When heat wave temperatures last longer than three days
>
> (Source: City of Boston EMS; MassResources.org)
>
> According to the 2007 report of the Union of Concerned Scientists *Northeast Climate-Change Impacts Assessment* the annual number of days over 90 degrees is likely to increase from the current 10 to between 32 to 64 by the end of the century; the number of days over 100, from 1 to between 6 to 24. See the UCS report for projected values at other times.

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

The Boston Water and Sewer Commission (BWSC) released in 2015 its *Wastewater and Storm Drainage System Facility Plan*, a technical report describing the BWSC's new capital plan for the storm and wastewater system. The IGBC recommends that project developers rely on the BWSC's projections. However, developers may present a case for considering different numbers.

An example of the BWSC precipitation projections follow in Table 7-15. Developers should consult the full report to identify the storm characteristics appropriate for their projects.

TABLE 7-15
Forecasted 10-year, 24-hour Design Storm Volumes and Peak Hourly Intensities

	Total Storm Volume (inches)			Peak Hourly Intensity (inches per hour)		
Scenario	**2035**	**2060**	**2100**	**2035**	**2060**	**2100**
Medium (B2)	5.55	5.76	6.08	1.76	1.83	1.93
Precautionary (A1FI)	5.60	6.03	6.65	1.78	1.91	2.11

The current BWSC 10-year, 24-hour design storm volume is 4.80 inches and peak intensity is 1.52 inches/hour.

Resiliency Checklist, Section C.2 - Sea-Level Rise and Storms: Analysis

Sea Level Rise

Sea-Level Rise (SLR) will increase with time and increase the frequency and extent of coastal flooding. Projections of sea-level rise are generally stated as ranges, and such projections are likely to change as scientists collect more data and update climate models. The City of Boston currently relies on the 2013 report of the Massachusetts Office of Coastal Zone Management (CZM) *Sea Level Rise: Understanding and Applying Trends and Future Scenarios for Analysis and Planning*, (reference information below). In particular, see page 10, table 3, and page 11, figure 5.

For the purpose of the requirements of Climate Change Workshop, the IGBC recommends that developers prepare for, at least, the CZM intermediate high scenario for most projects and the highest scenario for critical facilities and infrastructure. Proponents may present a case for considering other scenarios.

Scenario	2025		2038		2050		2063		2075		2088		2100	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
Highest	0.49	0.15	1.08	0.33	1.81	0.55	2.80	0.85	3.92	1.19	5.33	1.63	6.83	2.08
Intermediate High	0.36	0.11	0.73	0.22	1.19	0.36	1.80	0.55	2.47	0.75	3.32	1.01	4.20	1.28

Referenced Web Links:
Union of Concerned Scientists, Northeast Climate Change Assessment:
http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/pdf/confronting-climate-change-in-the-u-s-northeast.pdf

Boston Water and Sewer Commission
Available from the BWSC, 617-989-7000

Massachusetts Office of Coastal Zone Management, Seal Level Rise guidance:
http://www.mass.gov/eea/docs/czm/stormsmart/slr-guidance-2013.pdf

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

Climate Change Resiliency and Preparedness Checklist

A.1 - Project Information

Project Name:	**Proposed Mixed-Use Development**
Project Address Primary:	**40 Rugg Road, City of Boston (Allston), MA, 02134**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Kristina Vagen, The Michaels Organization**

A.2 - Team Description

Owner / Developer:	**The Michaels Organization**
Architect:	**DiMella Shaffer**
Engineer (building systems):	**CES**
Sustainability / LEED:	**New Ecology**
Permitting:	**Bohler Engineering**
Construction Management:	
Climate Change Expert:	**New Ecology**

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

PNF / Expanded PNF Submission	Draft / Final Project Impact Report Submission	BRA Board Approved	Notice of Project Change
Planned Development Area	BRA Final Design Approved	Under Construction	Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	**Residential**
List the First Floor Uses:	**Residential, Retail, Residential Amenities, Parking Garage**

What is the principal Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	**Concrete**

Describe the building?

Site Area:	**82,325± SF**	Building Area:	**Res. SF: 188,286 SF** **Parking SF: 46,340 SF**
Building Height:	**69** *Ft.*	Number of Stories:	**6** *Flrs.*
First Floor Elevation (reference Boston City Base):	**33'** *Elev.*	Are there below grade spaces/levels, if yes how many:	***No*** */ Number of Levels*

A.5 - Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)?

Select by Primary Use:	New Construction	Core & Shell	Healthcare	Schools
	Retail	**Homes Midrise**	Homes	Other
Select LEED Outcome:	Certified	**Silver**	Gold	Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	*Yes* / **No**	Certified:	*Yes* / **No**

A.6 - Building Energy (Information regarding the Building Energy will be provided as the building design develops)

What are the base a

Electric - base / peak:	/ *(kW)*	Heating – base / peak:	/ *(MMBtu/hr)*
What is the planned building Energy Use Intensity:	*(kbut/SF or kWh/SF)*	Cooling – base / peak:	/ *(Tons/hr)*

What are the peak energy demands of your critical systems in the event of a service interruption?

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
		Cooling:	*(Tons/hr)*

What is nature and source of your back-up / emergency generators?

Electrical Generation:	**200** *(kW)*		Fuel Source:	**Natural Gas**
System Type and Number of Units:	**1** Combustion Engine	Gas Turbine	Combine Heat and Power	*(Units)*

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	**50 Years**	75 Years

What is the full expected operational life of key building systems (e.g. heating, cooling, and ventilation)?

Select most appropriate:	10 Years	**25 Years**	50 Years	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	**25 Years**	50 Years	75 Years

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

75/70 *Deg.*	

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

95 *Deg.*	**3** *Days*	**2** *Events / yr.*

What Drought characteristics will be used for project planning – Duration and Frequency?

45-60 *Days*	**1** *Events / yr.*

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

44 *Inches / yr.*	**4.6** *Inches*	**0.1** *Events / yr.*

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

105 *Peak Wind*	**3 Seconds** *Hours*	**0.02** *Events / yr.*

B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:	**10** %
How is performance determined:	**Equest model will be built using ASHRAE 90.1-2013 baseline**

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:	**High performance building envelope**	**High performance lighting & controls**	Building day lighting	**EnergyStar equip. / appliances**
	High performance HVAC equipment	**Energy recovery ventilation**	No active cooling	No active heating
Describe any added measures:				

What are the insulation (R) values for building envelope elements?

Roof:	*R* = **30 c.i.**	Walls / Curtain Wall Assembly:	*R* = **13 + R-10 c.i. (steel) R = 18 + R-10 c.i. (wood)**
Foundation:	*R* = **20 for 48"**	Basement / Slab:	*R* = **10 full slab**
Windows:	*U* = **0.27**	Doors:	**U=0.4**

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

	On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
	On-site Solar PV	On-site Solar Thermal	Wind power	**None**
Describe any added measures:				

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate:	Connected to a local electrical micro-grid	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

Will the building remain operable without utility power for an extended period?

	*Yes / **No***	If yes, for how long:	*Days*
If Yes, is building "Islandable?			
If Yes, describe strategies:			

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	**Operable windows**	Natural ventilation	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	**High Performance Building Envelope**
Describe any added measures:				

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	High reflective paving materials	Shade trees & shrubs	**High reflective roof materials**	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:	**On-site retention systems & ponds**	**Infiltration galleries & areas**	vegetated water capture systems	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	Hardened building structure & elements	**Buried utilities & hardened infrastructure**	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

Yes /	**No**

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base Elev.(Ft.)* **Varies Between 32.0 - 34.0+/-**

Building Proximity to Water:	5,280 *Ft.*

Is the site or building located in any of the following?

Coastal Zone:	*Yes* / **No**	Velocity Zone:	*Yes* / **No**
Flood Zone:	*Yes* / **No**	Area Prone to Flooding:	*Yes* / **No**

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*Yes* / **No**	Future floodplain delineation updates:	*Yes* / **No**

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

5,280 *Ft.*

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. ***Otherwise you have completed the questionnaire; thank you!***

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*Ft.*	Frequency of storms:	*per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	Yes / No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1st Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No		If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	Yes / No
If Yes, describe:	

Will the building remain occupiable without utility power during an extended period of inundation:

	Yes / No	If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:	*Yes / No*	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	*Yes / No*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:				

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell@boston.gov

APPENDIX 3

PHASE 1 EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

AEI Consultants (AEI) was retained by University Student Living to conduct a Phase I ESA in conformance with the proposal and the scope and limitations of ASTM Standard Practice E1527-13 and the EPA Standards and Practices for All Appropriate Inquiries (40 CFR Part 312) for the property located at 84-76 Braintree Street, 10, 10R, and 38-40 Penniman Road and 28-32 and 40 Rugg Road, Allston, Suffolk County, Massachusetts. Any exceptions to, or deletions from, this practice are described in Sections 1.4, 1.5, and 1.6 of this report.

PROPERTY DESCRIPTION

PROPERTY INFORMATION	
Property Name	Multiple Commercial Properties
Street Address(es)	84-76 Braintree Street, 10, 10R, and 38-40 Penniman Road and 28-32 and 40 Rugg Road
City	Allston
State	Massachusetts
Location	Majority of the block surrounded by Braintree Street, Penniman Road, Rugg Road and Hano Street
Vicinity Characteristics	Commercial, open space and residential
Approximate Site Acreage/Source	96506 SF (2.22 acres)/Boston Assessor's Office 22,512 SF - 84-76 Braintree Street 7,722 SF - 10, 10R Penniman Road 11,460 SF - 38-40 Penniman Road 29,858 SF - 28-32 Rugg Road 10,809 SF - 40 Rugg Road
Property Type	Commercial and limited residential
Subject Property Use(s)	Auto repair, rim painting, upholstery, recording studio, apartments, moving company and storage, moped retail and repair
Assessor Parcel Number(s)	2201807000 - 84-76 Braintree Street 2201825000 - 10, 10R Penniman Road 2201821010 - 38-40 Penniman Road 2201810010 - 28-32 Rugg Road 2201808000 - 40 Rugg Road
SITE AND BUILDING INFORMATION	
Number of Buildings	5
Year(s) of Construction	1958 - 84-76 Braintree Street 1946 - 10, 10R Penniman Road 1925 - 38-40 Penniman Road 1925 - 28-32 Rugg Road 1920 - 40 Rugg Road
Number of Floors/Stories	One or 2 (28032 Rugg Road is the only 2 story building)
Basement or Subgrade Area(s)	Basement in 28-32 Rugg Road
Building Area (SF)/Source	3,760 SF - 84-76 Braintree Street 7,328 SF - 10, 10R Penniman Road 6,994 SF - 38-40 Penniman Road 18,000 SF - 28-32 Rugg Road 4,750 SF - 40 Rugg Road

Building Description(s)	84-76 Braintree Street - One one story corrugated metal building and one one story brick building 10, 10R Penniman Road - One story brick building 38-40 Penniman Road - One story brick building 28-32 Rugg Road - Two story brick building 40 Rugg Road - One story concrete block building
Building Occupant(s)	See table below
Additional Improvements	Paved parking
Current On-site Operations	Industrial loft, storage, auto and moped repair
Current Use of Hazardous Substances	Heating oil, new and used motor oil; refer to Section 7.1
UTILITY PROVIDER INFORMATION	
Natural Gas Provider	National Grid per Ben Herman
Electricity Provider	National Grid per Ben Herman
Heating System Fuel Source	Fuel Oil and Natural Gas per Ben Herman
Cooling System Power Source	Electricity per Ben Herman
Potable Water Provider or Source	Massachusetts Water Resources Authority per Ben Herman
Sewage Disposal Provider or Treatment System	Boston Water and Sewer Commission per Ben Herman
REGULATORY INFORMATION	
Regulatory Database Listings	HW Gen, SHWS, Release, LUST, RCRA-CESQG, RCRA Non Gen/NLR, EDR Hist Auto
Institutional Controls	None identified
Engineering Controls	None identified
Environmental Liens	None identified

Based on a review of historical sources, the subject property was developed circa 1925. The property at 84-79 Braintree Street was developed with a cleaners using naphtha circa 1925. By 1950, the naphtha tanks were gone and the facility was a dry cleaning facility. The original site buildings were demolished some time between 1964 and 1989, when the current building was erected.

The property at 10 Penniman was developed circa 1925 as a paint shop. Sometime between 1950 and 1964, laundry operations were being conducted on this parcel. Currently there is a moped retail and repair facility operateing at this location.

The property at 38-40 Penniman Road was first developed circa 1925 with a storage building. By 1950, the western portion of the current building was constructed and by 1964, the building was developed into its current configuration. Prior to its current use as an auto repair shop, it was used for rug storage and cleaning.

The property at 28-32 Rugg Road was developed circa 1950 with the current building. It was used for shipping and rug storage. It is currently used for welding and rim shining (first floor) and various commercial and residential tenants (second floor).

The property at 40 Rugg Road was developed circa 1925 with its current building. Various tenants have occupied this space including auto painting, bottling, and chemical manufacturing.

The following historical addresses were associated with the subject property: 82 Braintree Street and 40 Emery Road . These addresses were also researched as part of this assessment, except for the city directory search, which did not include Emery Road. Rugg Road was historically known as Emery Road until circa 1964.

Since the 1930s, dry cleaning operations have typically used chlorinated solvents, particularly PCE, during the dry cleaning process. These solvents, even when properly stored and handled, can readily migrate into the subsurface as a result of small releases associated with on-site operations. Chlorinated solvents are highly mobile chemicals that can easily accumulate in soil and migrate to groundwater beneath a facility. Based on this information, the presence of a dry cleaning facility on the subject property represents a significant environmental concern. A release of PCE to soil and groundwater has been documented: refer to Sections 4.1 and 5.1.

An auto repair facility has operated at 38-40 Penniman for at least 35 years, according to the current tenant. Numerous containers of motor oil, antifreeze, and motor oil filters were observed during the site reconnaissance of the auto repair businesses on site. Although minor staining typical of auto repair operations was observed in several areas, overall housekeeping appeared adequate to prevent an impact to the subsurface of the subject property. One floor drain was observed and likely connects to the sanitary sewer. No sumps, or other conduits to the subsurface of the subject property were observed. Although no secondary containment was currently in place for the drums and larger containers in use at the property, no evidence of a release was observed during the site reconnaissance. The subject property is not listed for any spills or releases in connection with the use or handling of these materials on the regulatory database. Based on this information and the good housekeeping observed, the auto repair operations at the subject property are not expected to represent a significant environmental concern.

The immediately surrounding properties consist of the following:

Direction from Site	Tenant/Use (Address)	Regulatory Database Listing(s)
North	Braintree Road followed by: Vacant land currently being redeveloped (83-89 Braintree Street)	SHWS, LUST, Release (83-89 Braintree Street)
East	Rugg Road followed by: MAB HAB (29 Denby Road) MAB Works (24 Denby Road) Boston Village Auto (449 Cambridge Street)	RCRA Gen/NLR, US AIRS (24 Denby Road)
South	The Granite Building (100 Hano Street) D&G Towing (2 Emery Road)	EDR Hist Auto (2 Emery Road)
West	20 and 30 Penniman Road, followed by Penniman Rd, beyond which is: Penniman Road Play Area NE Regional Council of Millwrights (90 Braintree Street)	

If the surrounding properties are listed in the regulatory database, please refer to Section 5.1 for discussion.

Based on groundwater monitoring data for the subject property obtained from a Phase II Comprehensive Site Assessment Report prepared by ECS, Inc. and dated January 2011, groundwater is present at an estimated depth of 58 to 11.8 feet bgs, and groundwater flows in a northwesterly direction.

FINDINGS

Recognized Environmental Condition (REC) is defined by the ASTM Standard Practice E1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

- The subject property is listed as a State Hazardous Waste Site with several Release Tracking Numbers (RTNs):
    - RTN 3-0506 includes 84-76 Braintree Street; 10 Penniman Road; 40 Rugg Road and issued for a release of chlorinated volatile organic compounds (CVOCs) and petroleum. The following Release Tracking Numbers (RTNs) were subsequently issued and linked to 3-0506:
        - RTN 3-24790 issued for indoor air imminent hazard (IH) with Immediate Response Action (IRA);
        - RTN 3-26104 issued for ½-inch of light non-aqueous phase liquid (LNAPL) in a monitoring well at 84 Braintree. IRA closed in 2008; and
        - RTN 3-26493 issued for IH condition in 40 Rugg Road, potential IH 84 Braintree and 10 Penniman (IRA closed in 2008.

    These properties were acquired by Braintree Realty Trust and a Notice of Responsibility (NOR) issued by MassDEP on July 22, 2014, with new regulatory deadlines for comprehensive site assessment and response actions. Therefore, the releases associated with these RTNs and ongoing response actions are considered a REC.

- RTN 3-0701 includes 20 Penniman (demolished and not part of the subject propery and 8-32 Rugg Road for a Downgradient Property Status (DPS). The DPS Submittal identified the potential source of the CVOC contamination as the former Sunshine Laundry (40 Rugg Road); and closure of the DPS for CVOCs is dependent on RTN 3-0506. The open status of the DPS is considered a REC.
- RTN 3-16868 includes 30 Penniman (4 story building and not part of the subject property), 38-40 Penniman and aportion of 28-32 Rugg Road beneath the eastern portion of the building and was issued for a release of petroleum. RTN 3-26524 was issued for additional detection of LNAPL in wells located in Mecca motors and RTN 3-2760 was issued for lead in soil. These RTNs were linked to RTN 3-16868. A Class C2 RAO (Temporary Solution) and IRAC was submitted in October 2011. At a minimum, environmental monitoring must be conducted. The presence of LNAPL in monitoring wells and the regulatory status (temporary solution) represent a REC.

Controlled Recognized Environmental Condition (CREC) is defined by the ASTM Standard Practice E1527-13 as a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

- AEI did not identify evidence of CRECs during the course of this assessment.

Historical Recognized Environmental Condition (HREC) is defined by the ASTM Standard Practice E1527-13 as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls.

- AEI did not identify evidence of HRECs during the course of this assessment.

Other Environmental Considerations warrant discussion, but do not qualify as RECs as defined by the ASTM Standard Practice E1527-13. These include, but are not limited to, de minimis conditions and/or environmental considerations such as the presence of ACMs, LBP, radon, mold, and lead in drinking water, which can affect the liabilities and financial obligations of the client, the health and safety of site occupants, and the value and marketability of the subject property.

- An inground lift was observed in Hynes Automotive (10R Penniman Road). Based on the history of this building, it is likely that the lift was installed post-1977, and therefore, unlikely to contain PCBs. Based on the age of the lift, the presence of this equipment is not expected to represent a significant environmental concern. However, soil sampling may be required by local agencies if the hydraulic lift is planned to be removed in the future.
- Due to the age of the subject property building(s), there is a potential that ACMs are present. All observed suspect ACMs at the subject property were in good condition at the time of the site reconnaissance and are not expected to pose a health and safety concern to the occupants of the subject property at this time. Based on the potential presence of ACMs, AEI recommends the implementation of an O&M Plan which stipulates that the repair and maintenance of damaged materials should be performed to protect the health and safety of the building occupants. In the event that building renovation or demolition activities are planned, a thorough asbestos survey to identify asbestos-containing building materials is required in accordance with the EPA NESHAP 40 CFR Part 61 prior to demolition or renovation activities that may disturb suspect ACMs.
- Due to the age of the subject property building(s), there is a potential that LBP is present. All observed painted surfaces were in good condition and are not expected to pose a health and safety concern to the occupants of the subject property at this time. Local regulations may apply to LBP in association with building demolition/renovations and worker/occupant protection. Actual material samples would need to be collected or an x-ray fluorescence (XRF) survey performed in order to determine if LBP is present. It should be noted that construction activities that disturb materials or paints containing any amount of lead may be subject to certain requirements of the OSHA lead standard

contained in 29 CFR 1910.1025 and 1926.62.AEI did not identify evidence of Other Environmental Considerations during the course of this assessment.

CONCLUSIONS, OPINIONS, AND RECOMMENDATIONS

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Standard Practice E1527-13 and the EPA Standards and Practices for All Appropriate Inquiries (40 CFR Part 312) of 84-76 Braintree Street, 10, 10R, and 38-40 Penniman Road and 28-32 and 40 Rugg Road, Allston, Suffolk County, Massachusetts, the *subject property*. Any exceptions to, or deletions from, this practice are described in Sections 1.4, 1.5, and 1.6 of this report.

AEI did not identify evidence of RECs or CRECs in connection with the property except for those previously identified in the Findings section. AEI recommends the following:

- The responsible party, current owner of the property, is obligated to conduct assessment and response actions in accordance with the Massachusetts Contingency Plan (MCP)

Reportable Release Lookup

The search returned 9 results | Search Keywords >> 'BOSTON-ALLSTON', 'RUGG' | Data last updated: 04/25/2017

Page:1 of 1 | Sorted by: RTN | GIS | Previous | Next

Select	RTN	City/ Town	Release Address	Site Name Location Aid	Reporting Category	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical Type	Files	GIS
☐	3-0000506	BOSTON-ALLSTON	40 RUGG RD	SUNSHINE LAUNDRY	NONE	1986-05-28	TIERI	2014-06-26	PHASE IV			Files	MAP
☐	3-0000701	BOSTON-ALLSTON	20-32 RUGG RD	ALBANY CARPET CLEANING	NONE	1988-10-15	RAO	2008-02-07	PHASE III	B1		Files	MAP
☐	3-0016868	BOSTON-ALLSTON	20-32 RUGG RD	FMR ALBANY CARPET CLEANERS	72 HR	1998-06-02	RAO	2011-11-01	PHASE IV	C2	Oil	Files	MAP
☐	3-0024790	BOSTON-ALLSTON	20-32 RUGG RD	FMR ALBANY CARPET CLEANERS	TWO HR	2005-04-21	RTN CLOSED	2006-02-17			Hazardous Material	Files	MAP
☐	3-0025927	BOSTON-ALLSTON	20 RUGG RD	NO LOCATION AID	TWO HR	2006-05-23	RAO	2006-07-31		A1	Oil	Files	MAP
☐	3-0026104	BOSTON-ALLSTON	40 RUGG RD	NO LOCATION AID	72 HR	2006-07-28	RTN CLOSED	2014-06-26	PHASE II		Oil	Files	MAP
☐	3-0026493	BOSTON-ALLSTON	40 RUGG ROAD / 84 BRAINTREE ST	10 PENNIMAN ROAD	TWO HR	2006-12-27	RTN CLOSED	2014-06-26			Hazardous Material	Files	MAP
☐	3-0026524	BOSTON-ALLSTON	20-32 RUGG RD	RUGG ROAD/MECCA MOTORS	72 HR	2007-01-12	RTN CLOSED	2008-01-18				Files	MAP
☐	3-0027600	BOSTON-ALLSTON	20-32 RUGG RD	RUGG RD	120 DY	2008-03-27	RTN CLOSED	2008-07-11			Hazardous Material	Files	MAP

Page:1 of 1 | Previous | Next

APPENDIX 4

TRAFFIC

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620001.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620001
Comment 1: N/S Street : Hano Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Hano St From North			Camrbidge St From East			Camrbidge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	1	3	0	110	5	0	6	102	0
07:15 AM	3	8	0	109	0	0	3	111	0
07:30 AM	2	9	0	97	4	0	8	92	0
07:45 AM	3	9	0	101	2	0	12	99	0
08:00 AM	1	3	0	114	1	0	5	102	0
08:15 AM	1	4	0	115	2	0	5	120	0
08:30 AM	0	4	0	111	1	0	9	99	0
08:45 AM	0	4	0	112	1	0	10	81	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	2	5	0	117	2	0	8	115	0
04:15 PM	1	4	0	138	4	0	8	106	0
04:30 PM	3	3	0	129	2	0	5	112	0
04:45 PM	0	6	0	142	4	0	8	113	0
05:00 PM	0	7	0	154	2	0	6	97	0
05:15 PM	0	7	3	140	2	5	9	96	0
05:30 PM	1	8	0	161	6	0	15	96	0
05:45 PM	2	9	0	144	3	0	4	98	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620001.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620001
Comment 1: N/S Street : Hano Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Hano St From North			Camrbidge St From East			Camrbidge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	0	10	0	0	0	2	0
07:15 AM	0	0	0	6	0	0	0	9	0
07:30 AM	0	0	0	10	0	0	0	6	0
07:45 AM	0	0	0	4	0	0	0	6	0
08:00 AM	0	0	0	7	0	0	0	2	0
08:15 AM	0	0	0	10	0	0	0	5	0
08:30 AM	0	0	0	3	0	0	0	3	0
08:45 AM	0	0	0	5	0	0	0	6	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	4	0	0	0	1	0
04:15 PM	0	0	0	3	0	0	0	3	0
04:30 PM	0	0	0	3	0	0	0	3	0
04:45 PM	0	0	0	2	0	0	0	3	0
05:00 PM	0	0	0	4	0	0	0	6	0
05:15 PM	0	0	0	2	0	0	0	4	0
05:30 PM	0	0	0	3	0	0	0	5	0
05:45 PM	0	0	0	3	0	0	0	4	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620001.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620001
Comment 1: N/S Street : Hano Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Hano St From North			Camrbidge St From East			Camrbidge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	6	1	0	13	0	1	0
07:15 AM	0	0	12	0	0	12	1	0	0
07:30 AM	0	0	9	0	0	15	0	0	0
07:45 AM	0	0	2	2	0	7	0	1	1
08:00 AM	0	1	5	0	0	11	0	2	0
08:15 AM	0	0	2	1	0	11	0	6	1
08:30 AM	0	0	3	0	0	9	1	0	5
08:45 AM	0	0	8	2	0	8	0	6	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	22	0	0	10	0	2	0
04:15 PM	0	0	15	2	0	11	0	1	0
04:30 PM	0	0	19	8	0	16	1	0	0
04:45 PM	0	0	11	1	0	8	0	1	0
05:00 PM	0	0	14	3	1	14	0	1	0
05:15 PM	0	0	12	3	0	24	0	1	6
05:30 PM	1	1	12	1	2	6	0	0	1
05:45 PM	0	0	17	5	0	17	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620001.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620001
Comment 1: N/S Street : Hano Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Hano St From North			Camrbidge St From East			Camrbidge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	0	10	0	0	0	2	0
07:15 AM	0	0	0	6	0	0	0	9	0
07:30 AM	0	0	0	10	0	0	0	6	0
07:45 AM	0	0	0	4	0	0	0	6	0
08:00 AM	0	0	0	7	0	0	0	2	0
08:15 AM	0	0	0	10	0	0	0	5	0
08:30 AM	0	0	0	3	0	0	0	3	0
08:45 AM	0	0	0	5	0	0	0	6	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	4	0	0	0	1	0
04:15 PM	0	0	0	3	0	0	0	3	0
04:30 PM	0	0	0	3	0	0	0	3	0
04:45 PM	0	0	0	2	0	0	0	3	0
05:00 PM	0	0	0	4	0	0	0	6	0
05:15 PM	0	0	0	2	0	0	0	4	0
05:30 PM	0	0	0	3	0	0	0	5	0
05:45 PM	0	0	0	3	0	0	0	4	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620001.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620001
Comment 1: N/S Street : Hano Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Hano St From North			Camrbidge St From East			Camrbidge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	1	3	0	110	5	0	6	102	0
07:15 AM	3	8	0	109	0	0	3	111	0
07:30 AM	2	9	0	97	4	0	8	92	0
07:45 AM	3	9	0	101	2	0	12	99	0
08:00 AM	1	3	0	114	1	0	5	102	0
08:15 AM	1	4	0	115	2	0	5	120	0
08:30 AM	0	4	0	111	1	0	9	99	0
08:45 AM	0	4	0	112	1	0	10	81	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	2	5	0	117	2	0	8	115	0
04:15 PM	1	4	0	138	4	0	8	106	0
04:30 PM	3	3	0	129	2	0	5	112	0
04:45 PM	0	6	0	142	4	0	8	113	0
05:00 PM	0	7	0	154	2	0	6	97	0
05:15 PM	0	7	3	140	2	5	9	96	0
05:30 PM	1	8	0	161	6	0	15	96	0
05:45 PM	2	9	0	144	3	0	4	98	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620001.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620001
Comment 1: N/S Street : Hano Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Hano St From North -- SB			Camrbidge St From East -- WB			Camrbidge St From West -- EB		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	6	1	0	13	0	1	0
07:15 AM	0	0	12	0	0	12	1	0	0
07:30 AM	0	0	9	0	0	15	0	0	0
07:45 AM	0	0	2	2	0	7	0	1	1
08:00 AM	0	1	5	0	0	11	0	2	0
08:15 AM	0	0	2	1	0	11	0	6	1
08:30 AM	0	0	3	0	0	9	1	0	5
08:45 AM	0	0	8	2	0	8	0	6	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	22	0	0	10	0	2	0
04:15 PM	0	0	15	2	0	11	0	1	0
04:30 PM	0	0	19	8	0	16	1	0	0
04:45 PM	0	0	11	1	0	8	0	1	0
05:00 PM	0	0	14	3	1	14	0	1	0
05:15 PM	0	0	12	3	0	24	0	1	6
05:30 PM	1	1	12	1	2	6	0	0	1
05:45 PM	0	0	17	5	0	17	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620002.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620002
Comment 1: N/S Street : Denby Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Denby St From North			Cambridge St From East			Cambridge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	2	1	0	113	3	0	2	106	0
07:15 AM	1	4	0	122	3	0	2	107	0
07:30 AM	2	6	0	85	2	0	0	88	0
07:45 AM	0	0	0	110	2	0	4	100	0
08:00 AM	0	3	0	124	5	0	2	103	0
08:15 AM	1	2	0	111	1	0	3	98	0
08:30 AM	1	7	0	114	6	0	4	111	0
08:45 AM	0	0	0	98	4	0	5	85	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	5	1	0	131	8	0	7	121	0
04:15 PM	2	5	0	137	0	0	2	123	0
04:30 PM	0	3	0	130	6	0	3	112	0
04:45 PM	0	4	0	145	3	0	1	127	0
05:00 PM	1	4	0	159	3	0	4	123	0
05:15 PM	3	5	0	150	4	0	4	108	0
05:30 PM	2	6	0	150	2	0	1	106	0
05:45 PM	0	3	0	164	2	0	5	108	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620002.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620002
Comment 1: N/S Street : Denby Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Denby St From North			Cambridge St From East			Cambridge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	0	8	0	0	0	2	0
07:15 AM	0	0	0	7	0	0	0	5	0
07:30 AM	0	0	0	8	0	0	0	5	0
07:45 AM	0	0	0	7	0	0	0	7	0
08:00 AM	0	0	0	6	0	0	0	3	0
08:15 AM	0	0	0	10	0	0	0	6	0
08:30 AM	0	0	0	4	0	0	0	2	0
08:45 AM	0	0	0	4	0	0	0	7	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	4	0	0	0	1	0
04:15 PM	0	0	0	2	0	0	0	2	0
04:30 PM	0	0	0	3	0	0	0	4	0
04:45 PM	0	0	0	2	0	0	0	3	0
05:00 PM	0	0	0	3	0	0	0	6	0
05:15 PM	0	0	0	3	0	0	0	4	0
05:30 PM	0	0	0	2	0	0	0	4	0
05:45 PM	0	0	0	3	0	0	0	5	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620002.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620002
Comment 1: N/S Street : Denby Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Denby St From North			Cambridge St From East			Cambridge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	13	2	0	4	0	1	0
07:15 AM	0	0	3	0	0	2	0	2	0
07:30 AM	0	0	13	0	0	2	0	2	0
07:45 AM	0	0	2	4	0	2	0	4	1
08:00 AM	1	0	8	0	0	4	0	6	2
08:15 AM	0	0	5	1	0	10	0	12	3
08:30 AM	0	0	3	0	0	1	0	3	1
08:45 AM	0	0	0	3	0	3	0	9	1
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	11	0	0	2	1	3	2
04:15 PM	0	0	4	3	0	4	0	3	0
04:30 PM	0	0	9	7	0	7	0	3	1
04:45 PM	0	0	6	4	0	1	0	1	1
05:00 PM	0	0	8	5	0	5	0	1	0
05:15 PM	0	0	14	4	0	14	0	1	0
05:30 PM	0	1	19	5	0	4	0	4	3
05:45 PM	0	1	23	3	1	4	0	1	2

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620002.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620002
Comment 1: N/S Street : Denby Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Denby St From North -- SB			Cambridge St From East -- WB			Cambridge St From West -- EB		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	13	2	0	4	0	1	0
07:15 AM	0	0	3	0	0	2	0	2	0
07:30 AM	0	0	13	0	0	2	0	2	0
07:45 AM	0	0	2	4	0	2	0	4	1
08:00 AM	1	0	8	0	0	4	0	6	2
08:15 AM	0	0	5	1	0	10	0	12	3
08:30 AM	0	0	3	0	0	1	0	3	1
08:45 AM	0	0	0	3	0	3	0	9	1
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	11	0	0	2	1	3	2
04:15 PM	0	0	4	3	0	4	0	3	0
04:30 PM	0	0	9	7	0	7	0	3	1
04:45 PM	0	0	6	4	0	1	0	1	1
05:00 PM	0	0	8	5	0	5	0	1	0
05:15 PM	0	0	14	4	0	14	0	1	0
05:30 PM	0	1	19	5	0	4	0	4	3
05:45 PM	0	1	23	3	1	4	0	1	2

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620002.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620002
Comment 1: N/S Street : Denby Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Denby St From North			Cambridge St From East			Cambridge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	2	1	0	113	3	0	2	106	0
07:15 AM	1	4	0	122	3	0	2	107	0
07:30 AM	2	6	0	85	2	0	0	88	0
07:45 AM	0	0	0	110	2	0	4	100	0
08:00 AM	0	3	0	124	5	0	2	103	0
08:15 AM	1	2	0	111	1	0	3	98	0
08:30 AM	1	7	0	114	6	0	4	111	0
08:45 AM	0	0	0	98	4	0	5	85	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	5	1	0	131	8	0	7	121	0
04:15 PM	2	5	0	137	0	0	2	123	0
04:30 PM	0	3	0	130	6	0	3	112	0
04:45 PM	0	4	0	145	3	0	1	127	0
05:00 PM	1	4	0	159	3	0	4	123	0
05:15 PM	3	5	0	150	4	0	4	108	0
05:30 PM	2	6	0	150	2	0	1	106	0
05:45 PM	0	3	0	164	2	0	5	108	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620002.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620002
Comment 1: N/S Street : Denby Street
Comment 2: E/W Street: Cambridge Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Denby St From North			Cambridge St From East			Cambridge St From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	0	8	0	0	0	2	0
07:15 AM	0	0	0	7	0	0	0	5	0
07:30 AM	0	0	0	8	0	0	0	5	0
07:45 AM	0	0	0	7	0	0	0	7	0
08:00 AM	0	0	0	6	0	0	0	3	0
08:15 AM	0	0	0	10	0	0	0	6	0
08:30 AM	0	0	0	4	0	0	0	2	0
08:45 AM	0	0	0	4	0	0	0	7	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	4	0	0	0	1	0
04:15 PM	0	0	0	2	0	0	0	2	0
04:30 PM	0	0	0	3	0	0	0	4	0
04:45 PM	0	0	0	2	0	0	0	3	0
05:00 PM	0	0	0	3	0	0	0	6	0
05:15 PM	0	0	0	3	0	0	0	4	0
05:30 PM	0	0	0	2	0	0	0	4	0
05:45 PM	0	0	0	3	0	0	0	5	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620003.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620003
Comment 1: N/S Street : Penniman Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Penniman Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	4	18	0	1	3	0	13	2	0
07:15 AM	1	17	0	4	3	0	11	3	0
07:30 AM	2	15	0	2	5	0	22	3	0
07:45 AM	0	19	0	1	7	0	20	1	0
08:00 AM	2	22	0	2	4	0	17	4	0
08:15 AM	0	21	0	4	6	0	21	1	0
08:30 AM	3	26	0	2	8	0	25	1	0
08:45 AM	4	32	0	3	9	0	17	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	4	20	0	4	3	0	33	7	0
04:15 PM	2	30	0	3	3	0	23	3	0
04:30 PM	0	21	0	2	5	0	21	2	0
04:45 PM	2	24	0	4	3	0	41	6	0
05:00 PM	6	24	0	2	3	0	57	6	0
05:15 PM	5	14	0	2	4	0	39	7	0
05:30 PM	5	23	0	2	2	0	40	8	0
05:45 PM	3	21	0	1	1	0	37	9	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620003.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620003
Comment 1: N/S Street : Penniman Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Penniman Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620003.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620003
Comment 1: N/S Street : Penniman Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Penniman Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	2	0	0	5	1	0	2
07:15 AM	0	0	0	0	0	8	0	0	2
07:30 AM	0	0	0	0	0	5	0	0	2
07:45 AM	0	0	0	0	0	1	0	0	0
08:00 AM	0	2	0	0	0	4	1	0	0
08:15 AM	0	1	0	0	1	7	1	0	0
08:30 AM	0	0	1	0	1	4	0	0	0
08:45 AM	0	0	2	1	0	6	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	1	1	0	0	0	6	0	0	0
04:15 PM	0	1	0	0	0	7	2	0	0
04:30 PM	0	2	2	0	0	6	1	0	0
04:45 PM	0	0	1	0	0	4	2	0	0
05:00 PM	0	3	0	0	0	7	2	0	0
05:15 PM	0	1	0	0	0	4	0	0	0
05:30 PM	0	2	0	0	0	3	1	1	0
05:45 PM	0	1	0	0	0	8	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620003.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620003
Comment 1: N/S Street : Penniman Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Penniman Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620003.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620003
Comment 1: N/S Street : Penniman Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Penniman Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	4	18	0	1	3	0	13	2	0
07:15 AM	1	17	0	4	3	0	11	3	0
07:30 AM	2	15	0	2	5	0	22	3	0
07:45 AM	0	19	0	1	7	0	20	1	0
08:00 AM	2	22	0	2	4	0	17	4	0
08:15 AM	0	21	0	4	6	0	21	1	0
08:30 AM	3	26	0	2	8	0	25	1	0
08:45 AM	4	32	0	3	9	0	17	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	4	20	0	4	3	0	33	7	0
04:15 PM	2	30	0	3	3	0	23	3	0
04:30 PM	0	21	0	2	5	0	21	2	0
04:45 PM	2	24	0	4	3	0	41	6	0
05:00 PM	6	24	0	2	3	0	57	6	0
05:15 PM	5	14	0	2	4	0	39	7	0
05:30 PM	5	23	0	2	2	0	40	8	0
05:45 PM	3	21	0	1	1	0	37	9	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620003.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620003
Comment 1: N/S Street : Penniman Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East -- WB			Penniman Rd From South -- NB			Braintree St From West -- EB		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	2	0	0	5	1	0	2
07:15 AM	0	0	0	0	0	8	0	0	2
07:30 AM	0	0	0	0	0	5	0	0	2
07:45 AM	0	0	0	0	0	1	0	0	0
08:00 AM	0	2	0	0	0	4	1	0	0
08:15 AM	0	1	0	0	1	7	1	0	0
08:30 AM	0	0	1	0	1	4	0	0	0
08:45 AM	0	0	2	1	0	6	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	1	1	0	0	0	6	0	0	0
04:15 PM	0	1	0	0	0	7	2	0	0
04:30 PM	0	2	2	0	0	6	1	0	0
04:45 PM	0	0	1	0	0	4	2	0	0
05:00 PM	0	3	0	0	0	7	2	0	0
05:15 PM	0	1	0	0	0	4	0	0	0
05:30 PM	0	2	0	0	0	3	1	1	0
05:45 PM	0	1	0	0	0	8	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620004.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620004
Comment 1: N/S Street : Rugg Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Rugg Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	6	17	0	5	2	0	13	4	0
07:15 AM	3	16	0	1	4	0	15	3	0
07:30 AM	2	25	0	0	3	0	25	4	0
07:45 AM	1	15	0	1	3	0	23	4	0
08:00 AM	0	23	0	2	2	0	21	3	0
08:15 AM	0	21	0	2	1	0	22	6	0
08:30 AM	1	22	0	5	8	0	26	6	0
08:45 AM	2	37	0	0	2	0	23	3	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	2	14	0	3	8	0	32	3	0
04:15 PM	4	29	0	6	2	0	28	0	0
04:30 PM	1	17	0	4	12	0	23	5	0
04:45 PM	3	23	0	3	6	0	38	5	0
05:00 PM	3	23	0	5	7	0	64	3	0
05:15 PM	3	18	0	1	6	0	44	2	0
05:30 PM	3	27	0	4	2	0	36	4	0
05:45 PM	1	20	0	6	4	0	39	1	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620004.ppd
Start Date: 4/13/2017
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Comment 1: N/S Street : Rugg Road
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Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Rugg Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620004.ppd
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Comment 1: N/S Street : Rugg Road
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	Braintree St From East			Rugg Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	2	0	1	3	1	0	14
07:15 AM	0	0	3	0	0	4	0	0	5
07:30 AM	0	0	1	0	0	4	0	0	0
07:45 AM	0	0	0	0	0	2	0	0	5
08:00 AM	0	2	0	0	0	2	0	0	6
08:15 AM	1	1	0	0	0	5	1	0	2
08:30 AM	0	0	0	0	1	4	1	0	1
08:45 AM	1	0	0	0	0	0	0	0	2
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	2	3	0	0	3	0	0	0
04:15 PM	0	1	0	0	0	4	2	0	3
04:30 PM	0	0	3	0	0	5	0	0	0
04:45 PM	0	0	0	0	0	1	2	0	0
05:00 PM	1	3	0	0	0	8	1	0	1
05:15 PM	0	1	0	0	0	1	0	0	2
05:30 PM	0	1	0	0	0	5	2	0	0
05:45 PM	0	3	0	0	0	8	1	0	4

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620004.ppd
Start Date: 4/13/2017
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Site Code: 17620004
Comment 1: N/S Street : Rugg Road
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	Braintree St From East --WB			Rugg Rd From South -- NB			Braintree St From West -- EB		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	2	0	1	3	1	0	14
07:15 AM	0	0	3	0	0	4	0	0	5
07:30 AM	0	0	1	0	0	4	0	0	0
07:45 AM	0	0	0	0	0	2	0	0	5
08:00 AM	0	2	0	0	0	2	0	0	6
08:15 AM	1	1	0	0	0	5	1	0	2
08:30 AM	0	0	0	0	1	4	1	0	1
08:45 AM	1	0	0	0	0	0	0	0	2
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	2	3	0	0	3	0	0	0
04:15 PM	0	1	0	0	0	4	2	0	3
04:30 PM	0	0	3	0	0	5	0	0	0
04:45 PM	0	0	0	0	0	1	2	0	0
05:00 PM	1	3	0	0	0	8	1	0	1
05:15 PM	0	1	0	0	0	1	0	0	2
05:30 PM	0	1	0	0	0	5	2	0	0
05:45 PM	0	3	0	0	0	8	1	0	4

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620004.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620004
Comment 1: N/S Street : Rugg Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Rugg Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	6	17	0	5	2	0	13	4	0
07:15 AM	3	16	0	1	4	0	15	3	0
07:30 AM	2	25	0	0	3	0	25	4	0
07:45 AM	1	15	0	1	3	0	23	4	0
08:00 AM	0	23	0	2	2	0	21	3	0
08:15 AM	0	21	0	2	1	0	22	6	0
08:30 AM	1	22	0	5	8	0	26	6	0
08:45 AM	2	37	0	0	2	0	23	3	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	2	14	0	3	8	0	32	3	0
04:15 PM	4	29	0	6	2	0	28	0	0
04:30 PM	1	17	0	4	12	0	23	5	0
04:45 PM	3	23	0	3	6	0	38	5	0
05:00 PM	3	23	0	5	7	0	64	3	0
05:15 PM	3	18	0	1	6	0	44	2	0
05:30 PM	3	27	0	4	2	0	36	4	0
05:45 PM	1	20	0	6	4	0	39	1	0

File Name: C:\Users\stevi\Documents\2017\Petra\Allston, MA\Kittleson\1762\17620004.ppd
Start Date: 4/13/2017
Start Time: 7:00:00 AM
Site Code: 17620004
Comment 1: N/S Street : Rugg Road
Comment 2: E/W Street: Braintree Street
Comment 3: City/State : Allston, MA
Comment 4: Weather : Clear

	Braintree St From East			Rugg Rd From South			Braintree St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Hano St From North		Camrbidge St From East		Camrbidge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	1	3	120	5	6	104	239
07:15 AM	3	8	115	0	3	120	249
07:30 AM	2	9	107	4	8	98	228
07:45 AM	3	9	105	2	12	105	236
Total	9	29	447	11	29	427	952
08:00 AM	1	3	121	1	5	104	235
08:15 AM	1	4	125	2	5	125	262
08:30 AM	0	4	114	1	9	102	230
08:45 AM	0	4	117	1	10	87	219
Total	2	15	477	5	29	418	946
Grand Total	11	44	924	16	58	845	1898
Apprch %	20	80	98.3	1.7	6.4	93.6	
Total %	0.6	2.3	48.7	0.8	3.1	44.5	
Cars	11	44	869	16	58	806	1804
% Cars	100	100	94	100	100	95.4	95
Trucks	0	0	55	0	0	39	94
% Trucks	0	0	6	0	0	4.6	5

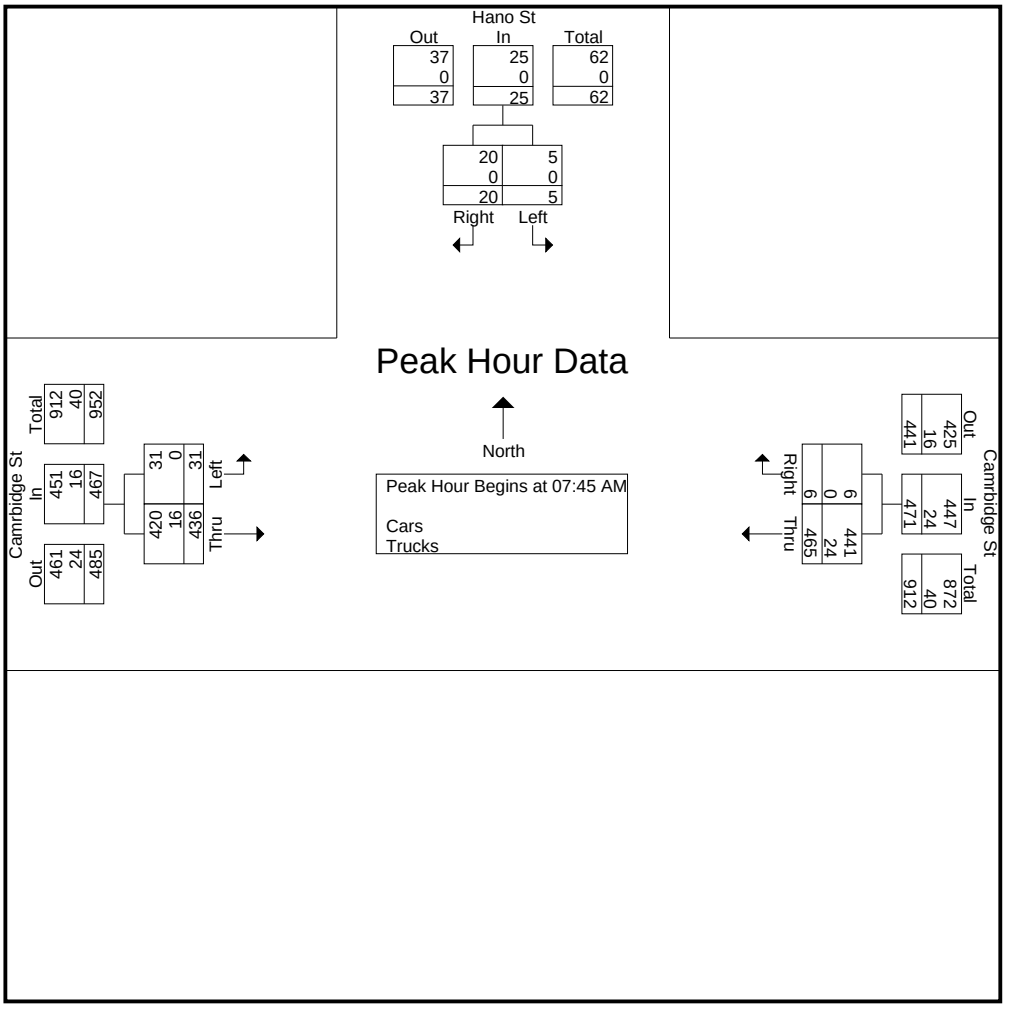
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 2

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	**3**	**9**	**12**	105	**2**	107	**12**	105	117	236
08:00 AM	1	3	4	121	1	122	5	104	109	235
08:15 AM	1	4	5	**125**	2	**127**	5	**125**	**130**	**262**
08:30 AM	0	4	4	114	1	115	9	102	111	230
Total Volume	5	20	25	465	6	471	31	436	467	963
% App. Total	20	80		98.7	1.3		6.6	93.4		
PHF	.417	.556	.521	.930	.750	.927	.646	.872	.898	.919
Cars	5	20	25	441	6	447	31	420	451	923
% Cars	100	100	100	94.8	100	94.9	100	96.3	96.6	95.8
Trucks	0	0	0	24	0	24	0	16	16	40
% Trucks	0	0	0	5.2	0	5.1	0	3.7	3.4	4.2



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

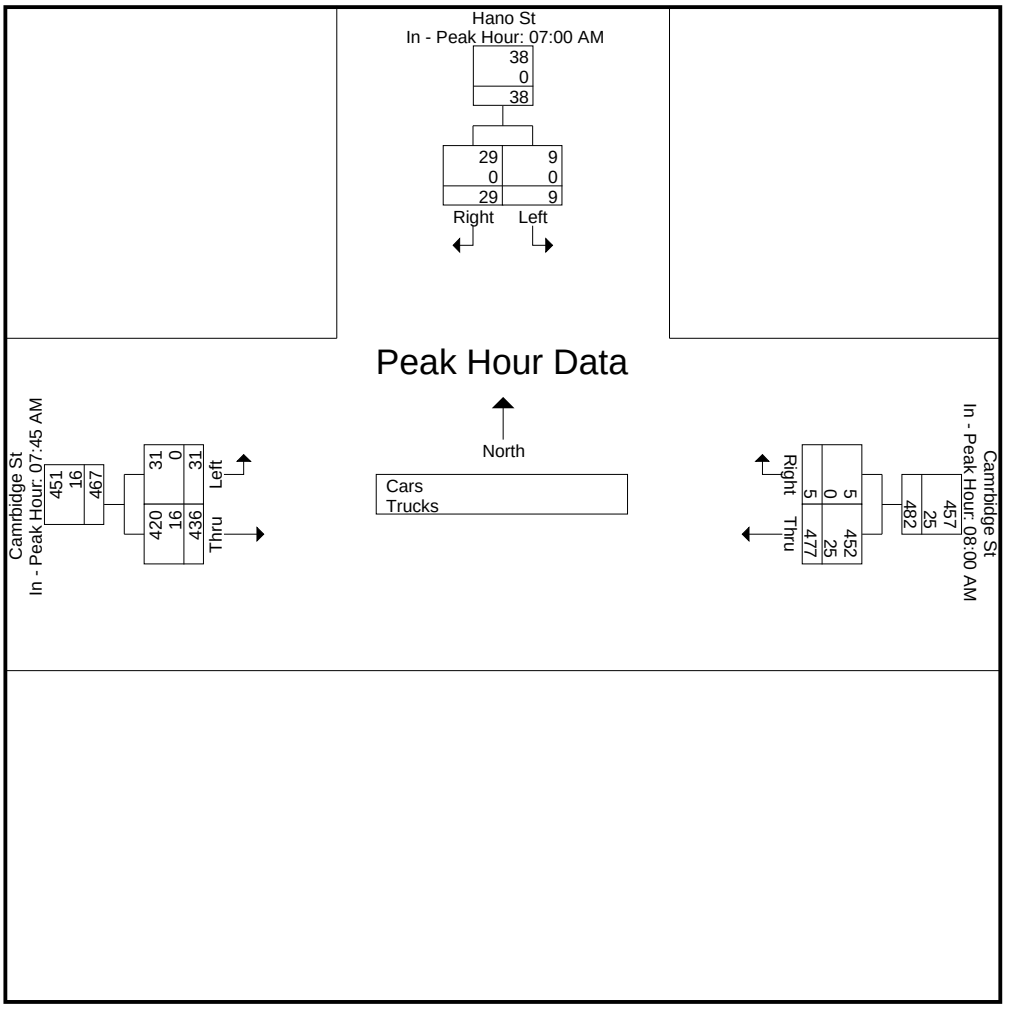
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 3

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:45 AM		
+0 mins.	1	3	4	121	1	122	**12**	105	117
+15 mins.	**3**	8	11	**125**	**2**	**127**	5	104	109
+30 mins.	2	**9**	11	114	1	115	5	**125**	**130**
+45 mins.	3	9	**12**	117	1	118	9	102	111
Total Volume	9	29	38	477	5	482	31	436	467
% App. Total	23.7	76.3		99	1		6.6	93.4	
PHF	.750	.806	.792	.954	.625	.949	.646	.872	.898
Cars	9	29	38	452	5	457	31	420	451
% Cars	100	100	100	94.8	100	94.8	100	96.3	96.6
Trucks	0	0	0	25	0	25	0	16	16
% Trucks	0	0	0	5.2	0	5.2	0	3.7	3.4



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017

Groups Printed- Cars

	Hano St From North		Camrbidge St From East		Camrbidge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	1	3	110	5	6	102	227
07:15 AM	3	8	109	0	3	111	234
07:30 AM	2	9	97	4	8	92	212
07:45 AM	3	9	101	2	12	99	226
Total	9	29	417	11	29	404	899
08:00 AM	1	3	114	1	5	102	226
08:15 AM	1	4	115	2	5	120	247
08:30 AM	0	4	111	1	9	99	224
08:45 AM	0	4	112	1	10	81	208
Total	2	15	452	5	29	402	905
Grand Total	11	44	869	16	58	806	1804
Apprch %	20	80	98.2	1.8	6.7	93.3	
Total %	0.6	2.4	48.2	0.9	3.2	44.7	

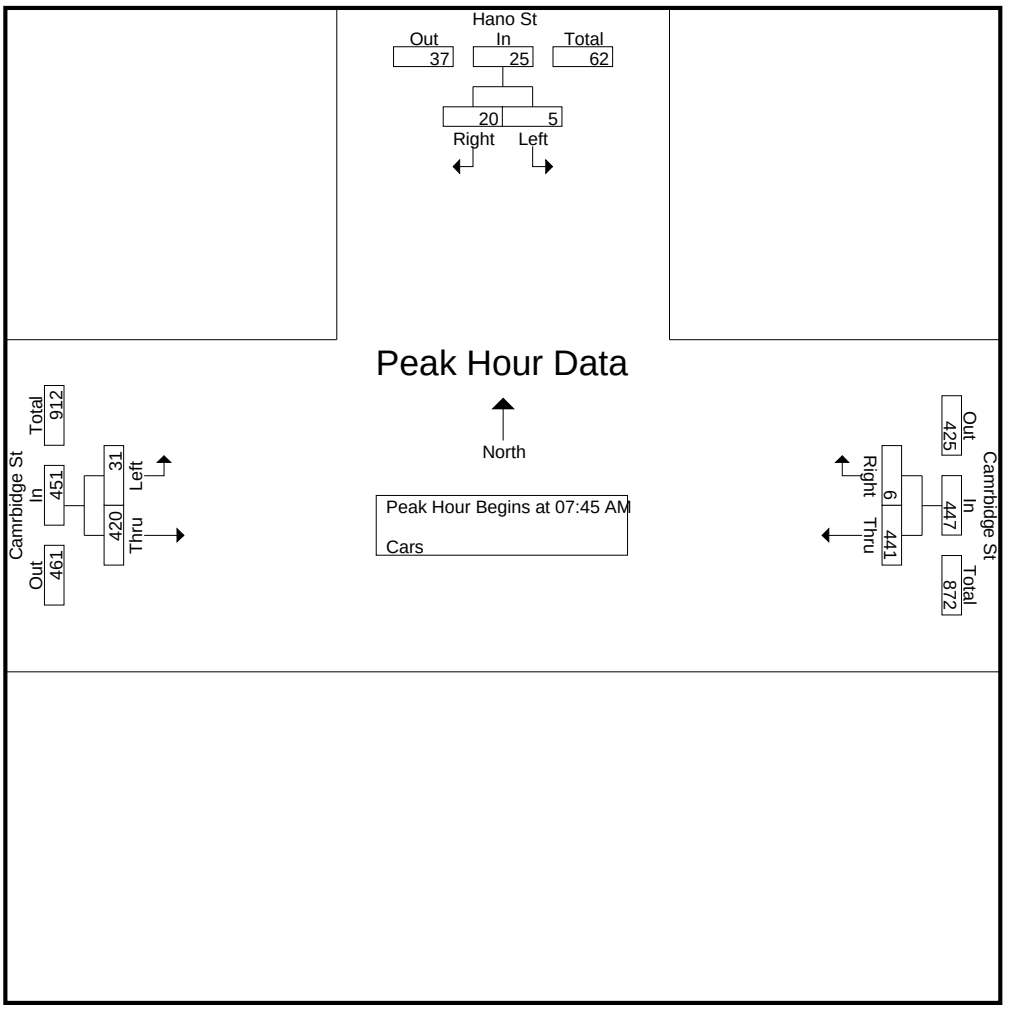
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 5

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	**3**	**9**	**12**	101	**2**	103	**12**	99	111	226
08:00 AM	1	3	4	114	1	115	5	102	107	226
08:15 AM	1	4	5	**115**	2	**117**	5	**120**	**125**	**247**
08:30 AM	0	4	4	111	1	112	9	99	108	224
Total Volume	5	20	25	441	6	447	31	420	451	923
% App. Total	20	80		98.7	1.3		6.9	93.1		
PHF	.417	.556	.521	.959	.750	.955	.646	.875	.902	.934



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

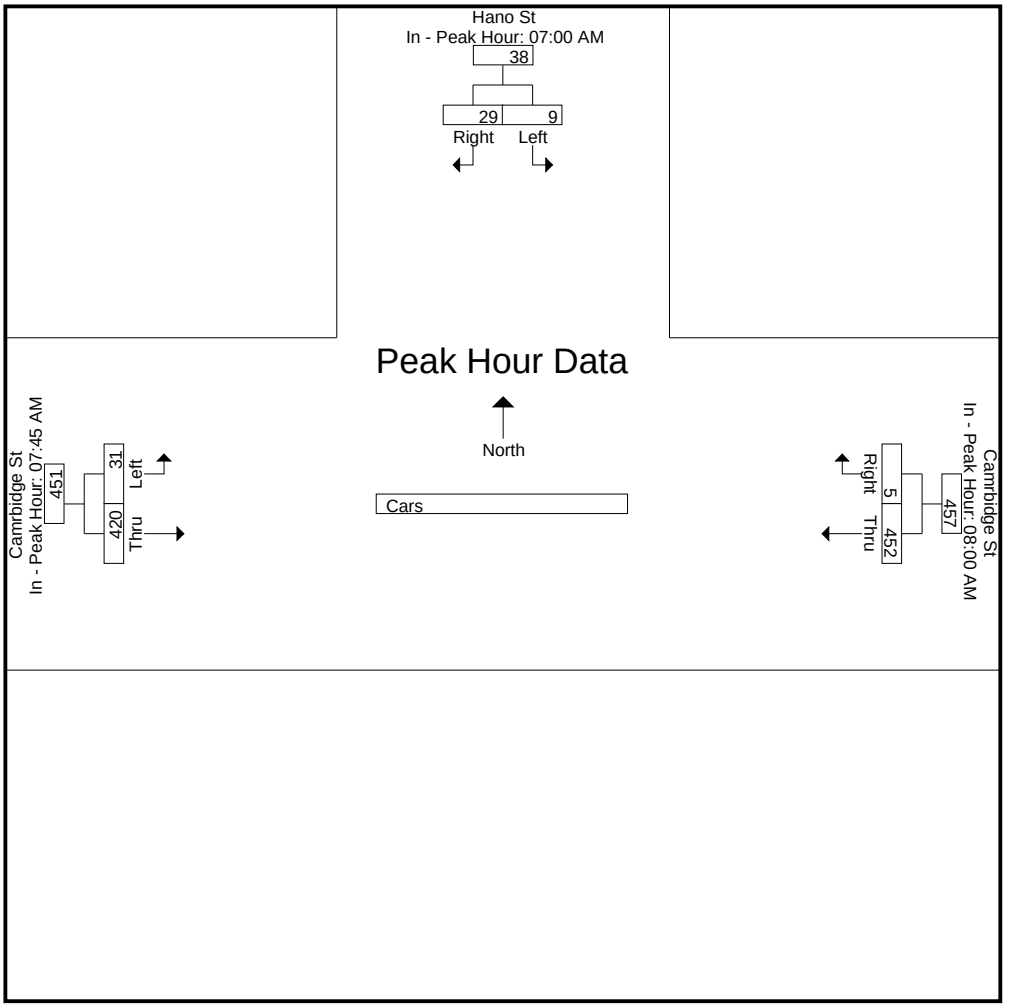
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 6

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:45 AM		
+0 mins.	1	3	4	114	1	115	**12**	99	111
+15 mins.	**3**	8	11	**115**	**2**	**117**	5	102	107
+30 mins.	2	**9**	11	111	1	112	5	**120**	**125**
+45 mins.	3	9	**12**	112	1	113	9	99	108
Total Volume	9	29	38	452	5	457	31	420	451
% App. Total	23.7	76.3		98.9	1.1		6.9	93.1	
PHF	.750	.806	.792	.983	.625	.976	.646	.875	.902



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017

Groups Printed- Trucks

	Hano St From North		Camrbidge St From East		Camrbidge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	0	10	0	0	2	12
07:15 AM	0	0	6	0	0	9	15
07:30 AM	0	0	10	0	0	6	16
07:45 AM	0	0	4	0	0	6	10
Total	0	0	30	0	0	23	53
08:00 AM	0	0	7	0	0	2	9
08:15 AM	0	0	10	0	0	5	15
08:30 AM	0	0	3	0	0	3	6
08:45 AM	0	0	5	0	0	6	11
Total	0	0	25	0	0	16	41
Grand Total	0	0	55	0	0	39	94
Apprch %	0	0	100	0	0	100	
Total %	0	0	58.5	0	0	41.5	

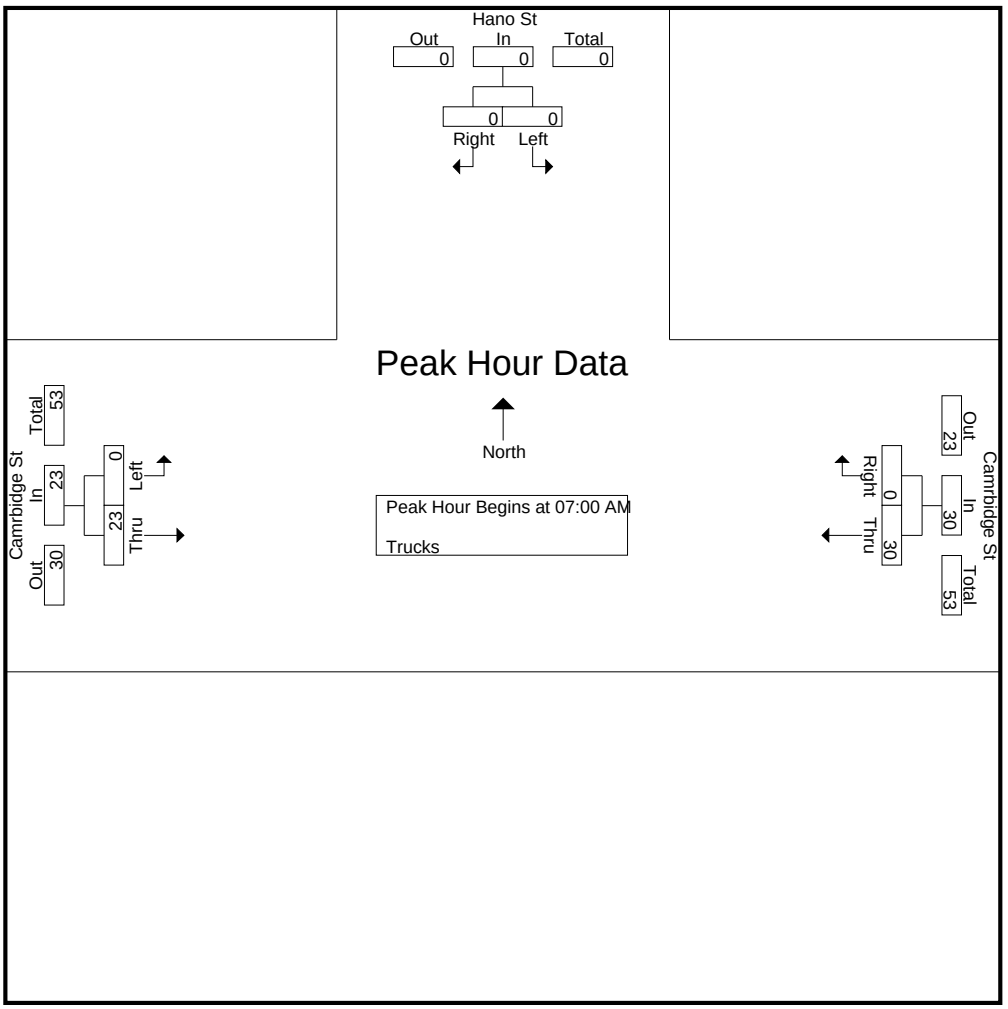
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 8

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	**10**	0	**10**	0	2	2	12
07:15 AM	0	0	0	6	0	6	0	**9**	**9**	15
07:30 AM	0	0	0	10	0	10	0	6	6	**16**
07:45 AM	0	0	0	4	0	4	0	6	6	10
Total Volume	0	0	0	30	0	30	0	23	23	53
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.750	.000	.750	.000	.639	.639	.828



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

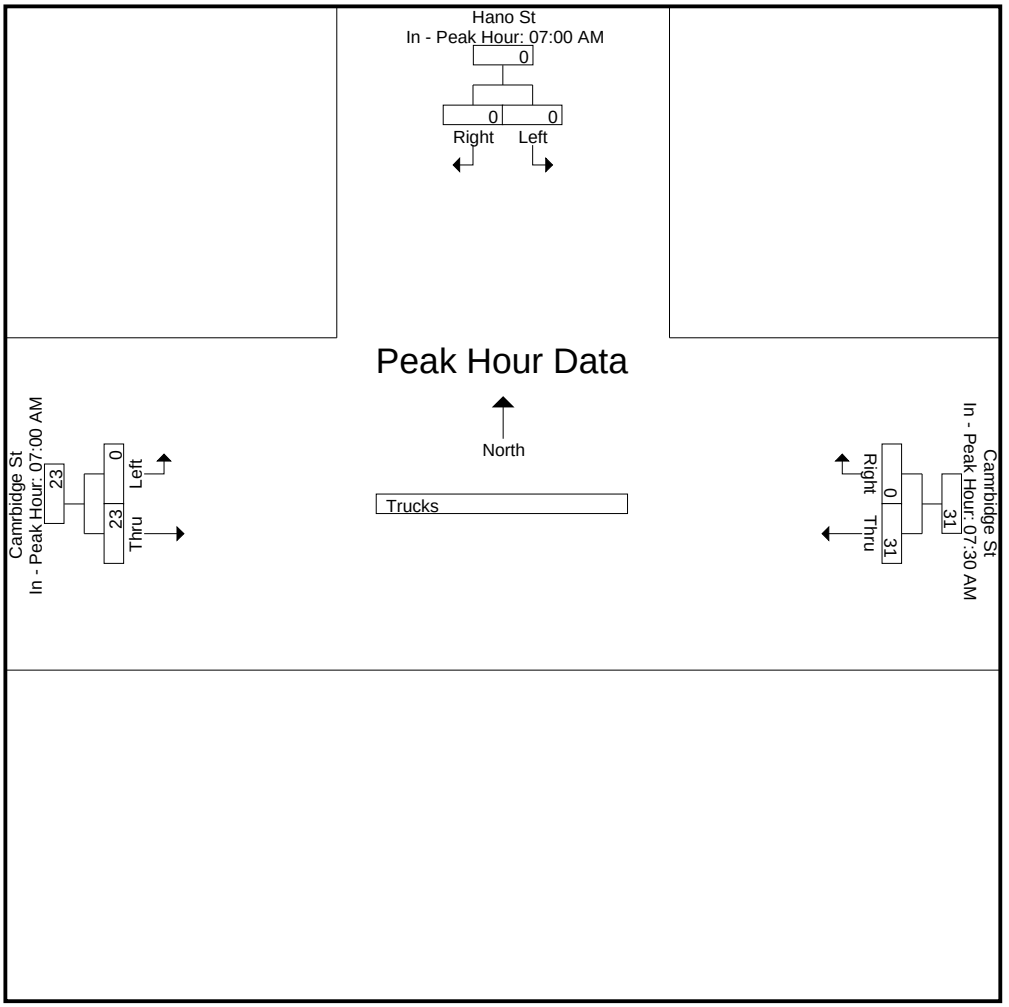
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 9

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:30 AM			07:00 AM		
+0 mins.	0	0	0	**10**	0	**10**	0	2	2
+15 mins.	0	0	0	4	0	4	0	**9**	**9**
+30 mins.	0	0	0	7	0	7	0	6	6
+45 mins.	0	0	0	10	0	10	0	6	6
Total Volume	0	0	0	31	0	31	0	23	23
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.775	.000	.775	.000	.639	.639



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017

Groups Printed- Bikes Peds

	Hano St From North			Camrbidge St From East			Camrbidge St From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	6	1	0	13	0	1	0	19	2	21
07:15 AM	0	0	12	0	0	12	1	0	0	24	1	25
07:30 AM	0	0	9	0	0	15	0	0	0	24	0	24
07:45 AM	0	0	2	2	0	7	0	1	1	10	3	13
Total	0	0	29	3	0	47	1	2	1	77	6	83
08:00 AM	0	1	5	0	0	11	0	2	0	16	3	19
08:15 AM	0	0	2	1	0	11	0	6	1	14	7	21
08:30 AM	0	0	3	0	0	9	1	0	5	17	1	18
08:45 AM	0	0	8	2	0	8	0	6	0	16	8	24
Total	0	1	18	3	0	39	1	14	6	63	19	82
Grand Total	0	1	47	6	0	86	2	16	7	140	25	165
Apprch %	0	100		100	0		11.1	88.9				
Total %	0	4		24	0		8	64		84.8	15.2	

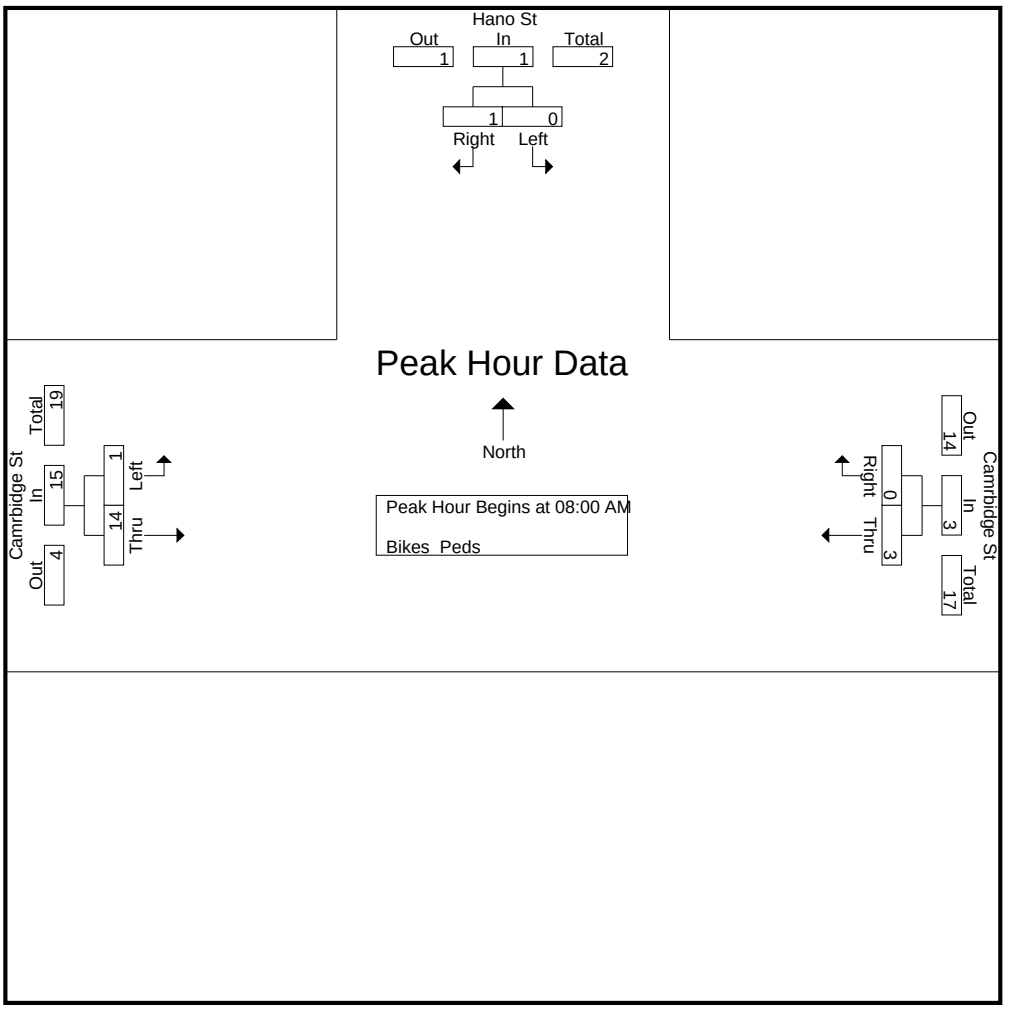
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 11

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	**1**	**1**	0	0	0	0	2	2	3
08:15 AM	0	0	0	1	0	1	0	**6**	**6**	7
08:30 AM	0	0	0	0	0	0	**1**	0	1	1
08:45 AM	0	0	0	**2**	0	**2**	0	6	6	**8**
Total Volume	0	1	1	3	0	3	1	14	15	19
% App. Total	0	100		100	0		6.7	93.3		
PHF	.000	.250	.250	.375	.000	.375	.250	.583	.625	.594



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

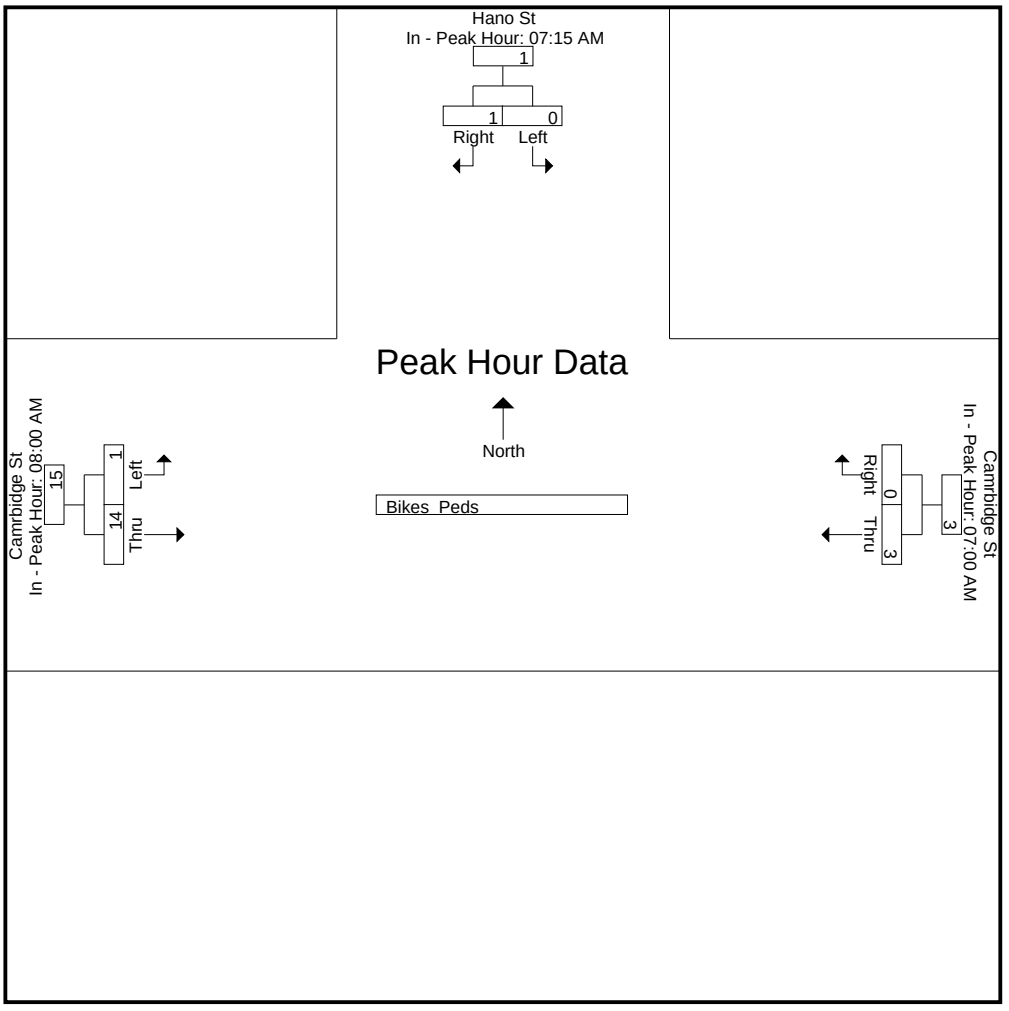
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 12

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			08:00 AM		
+0 mins.	0	0	0	1	0	1	0	2	2
+15 mins.	0	0	0	0	0	0	0	**6**	**6**
+30 mins.	0	0	0	0	0	0	**1**	0	1
+45 mins.	0	**1**	**1**	**2**	0	**2**	0	6	6
Total Volume	0	1	1	3	0	3	1	14	15
% App. Total	0	100		100	0		6.7	93.3	
PHF	.000	.250	.250	.375	.000	.375	.250	.583	.625



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Hano St From North		Camrbidge St From East		Camrbidge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	2	5	121	2	8	116	254
04:15 PM	1	4	141	4	8	109	267
04:30 PM	3	3	132	2	5	115	260
04:45 PM	0	6	144	4	8	116	278
Total	6	18	538	12	29	456	1059
05:00 PM	0	7	158	2	6	103	276
05:15 PM	0	7	142	2	9	100	260
05:30 PM	1	8	164	6	15	101	295
05:45 PM	2	9	147	3	4	102	267
Total	3	31	611	13	34	406	1098
Grand Total	9	49	1149	25	63	862	2157
Apprch %	15.5	84.5	97.9	2.1	6.8	93.2	
Total %	0.4	2.3	53.3	1.2	2.9	40	
Cars	9	49	1125	25	63	833	2104
% Cars	100	100	97.9	100	100	96.6	97.5
Trucks	0	0	24	0	0	29	53
% Trucks	0	0	2.1	0	0	3.4	2.5

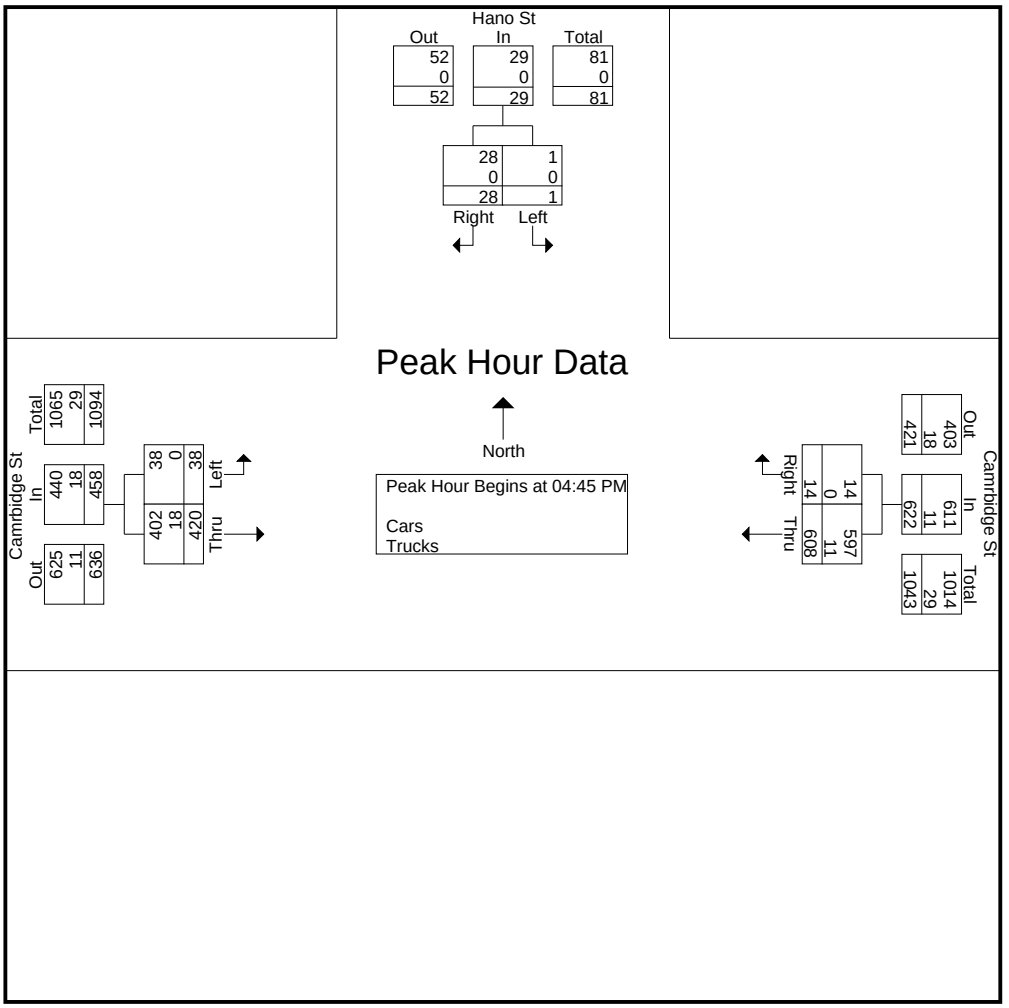
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 2

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	6	6	144	4	148	8	**116**	**124**	278
05:00 PM	0	7	7	158	2	160	6	103	109	276
05:15 PM	0	7	7	142	2	144	9	100	109	260
05:30 PM	**1**	**8**	**9**	**164**	**6**	**170**	**15**	101	116	**295**
Total Volume	1	28	29	608	14	622	38	420	458	1109
% App. Total	3.4	96.6		97.7	2.3		8.3	91.7		
PHF	.250	.875	.806	.927	.583	.915	.633	.905	.923	.940
Cars	1	28	29	597	14	611	38	402	440	1080
% Cars	100	100	100	98.2	100	98.2	100	95.7	96.1	97.4
Trucks	0	0	0	11	0	11	0	18	18	29
% Trucks	0	0	0	1.8	0	1.8	0	4.3	3.9	2.6



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

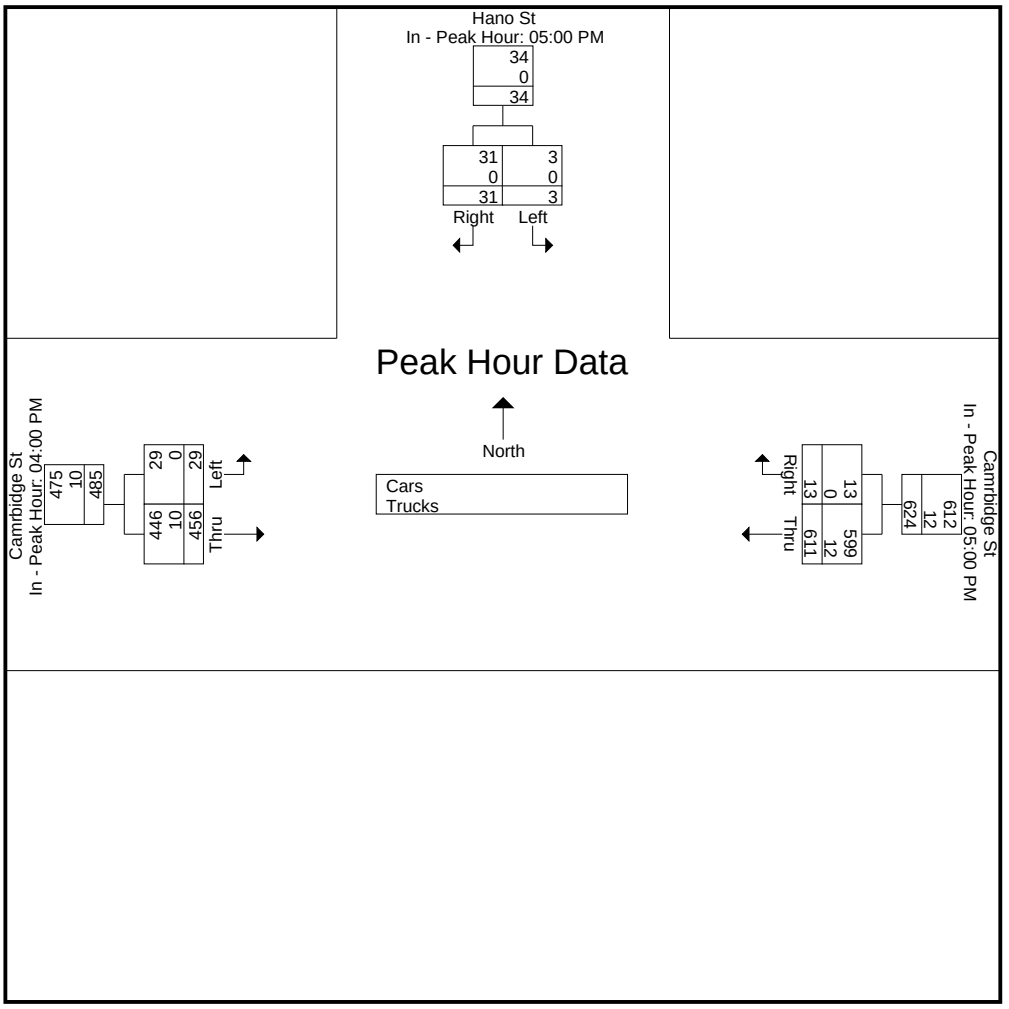
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 3

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			04:00 PM		
+0 mins.	0	7	7	158	2	160	**8**	**116**	**124**
+15 mins.	0	7	7	142	2	144	8	109	117
+30 mins.	1	8	9	**164**	**6**	**170**	5	115	120
+45 mins.	**2**	**9**	**11**	147	3	150	8	116	124
Total Volume	3	31	34	611	13	624	29	456	485
% App. Total	8.8	91.2		97.9	2.1		6	94	
PHF	.375	.861	.773	.931	.542	.918	.906	.983	.978
Cars	3	31	34	599	13	612	29	446	475
% Cars	100	100	100	98	100	98.1	100	97.8	97.9
Trucks	0	0	0	12	0	12	0	10	10
% Trucks	0	0	0	2	0	1.9	0	2.2	2.1



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017

Groups Printed- Cars

	Hano St From North		Camrbidge St From East		Camrbidge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	2	5	117	2	8	115	249
04:15 PM	1	4	138	4	8	106	261
04:30 PM	3	3	129	2	5	112	254
04:45 PM	0	6	142	4	8	113	273
Total	6	18	526	12	29	446	1037
05:00 PM	0	7	154	2	6	97	266
05:15 PM	0	7	140	2	9	96	254
05:30 PM	1	8	161	6	15	96	287
05:45 PM	2	9	144	3	4	98	260
Total	3	31	599	13	34	387	1067
Grand Total	9	49	1125	25	63	833	2104
Apprch %	15.5	84.5	97.8	2.2	7	93	
Total %	0.4	2.3	53.5	1.2	3	39.6	

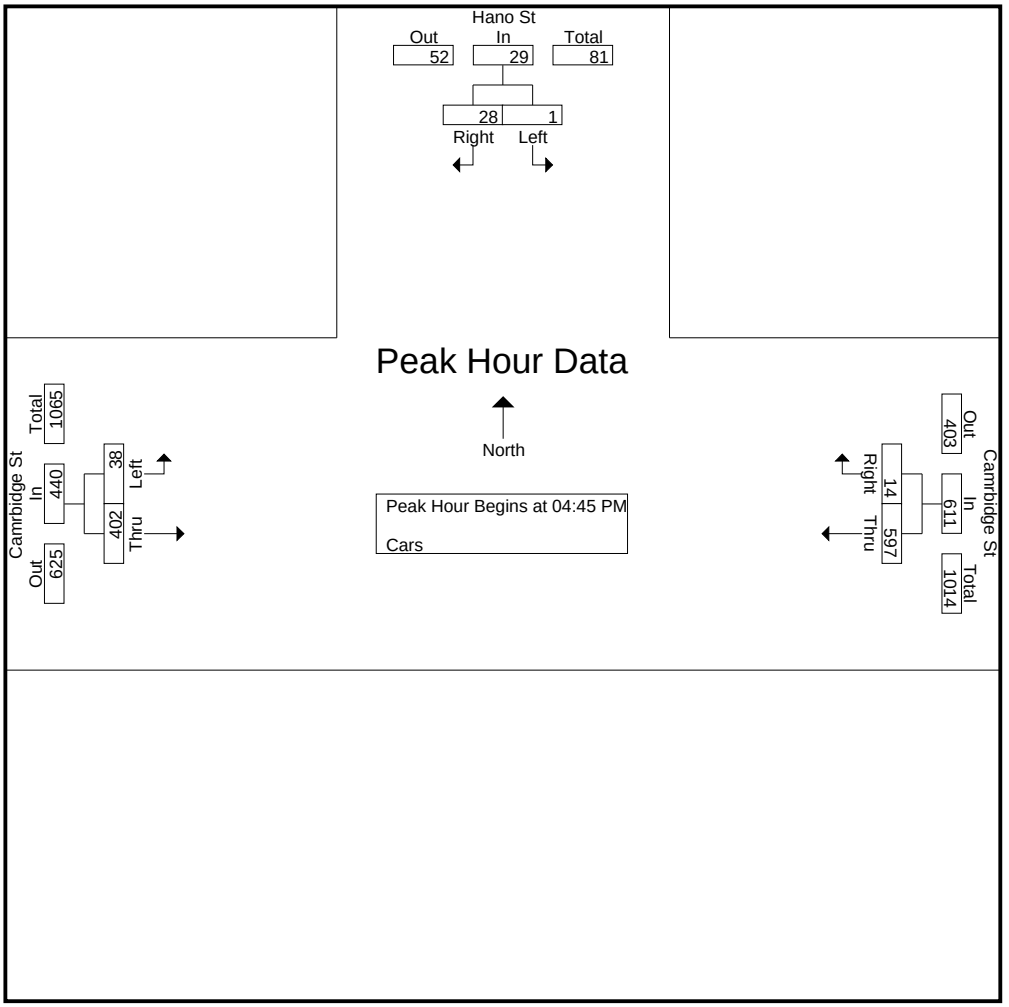
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 5

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	6	6	142	4	146	8	**113**	**121**	273
05:00 PM	0	7	7	154	2	156	6	97	103	266
05:15 PM	0	7	7	140	2	142	9	96	105	254
05:30 PM	**1**	**8**	**9**	**161**	**6**	**167**	**15**	96	111	**287**
Total Volume	1	28	29	597	14	611	38	402	440	1080
% App. Total	3.4	96.6		97.7	2.3		8.6	91.4		
PHF	.250	.875	.806	.927	.583	.915	.633	.889	.909	.941



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

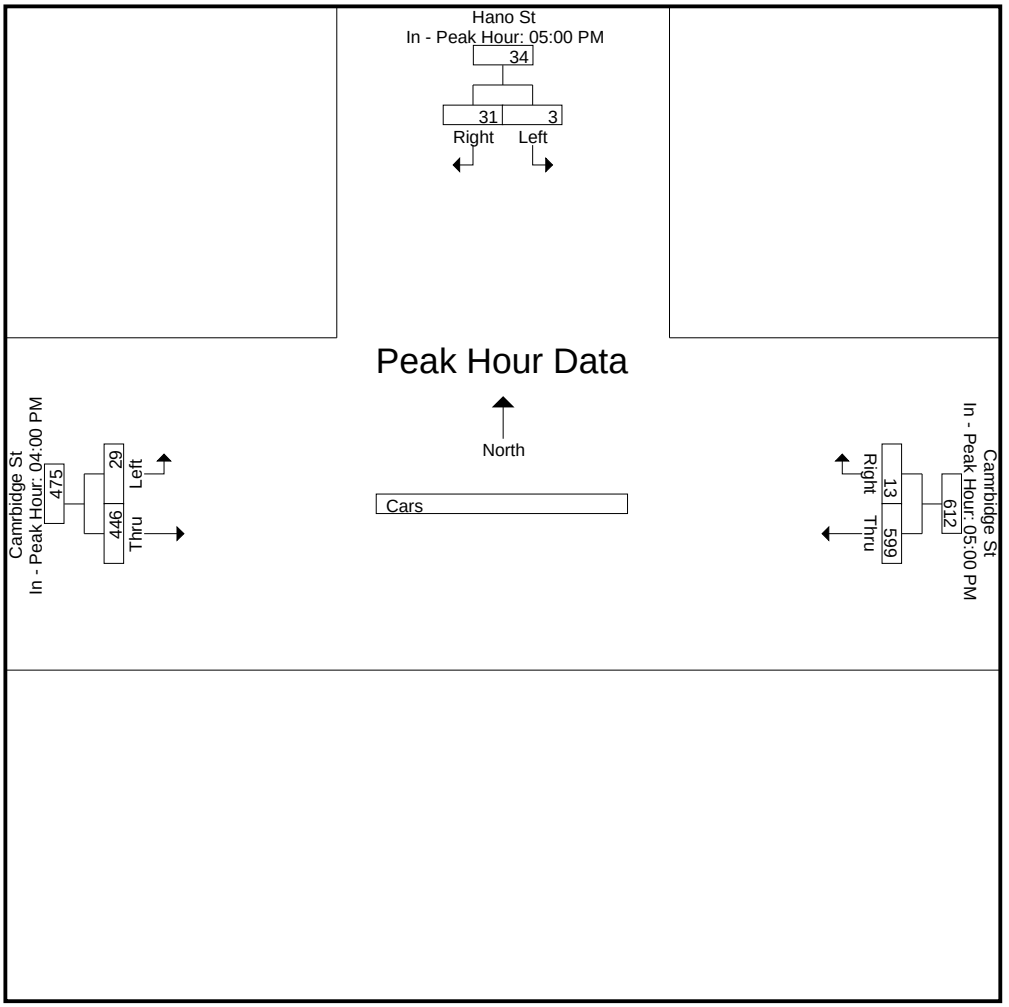
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 6

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			04:00 PM		
+0 mins.	0	7	7	154	2	156	**8**	**115**	**123**
+15 mins.	0	7	7	140	2	142	8	106	114
+30 mins.	1	8	9	**161**	**6**	**167**	5	112	117
+45 mins.	**2**	**9**	**11**	144	3	147	8	113	121
Total Volume	3	31	34	599	13	612	29	446	475
% App. Total	8.8	91.2		97.9	2.1		6.1	93.9	
PHF	.375	.861	.773	.930	.542	.916	.906	.970	.965



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017

Groups Printed- Trucks

	Hano St From North		Camrbidge St From East		Camrbidge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	4	0	0	1	5
04:15 PM	0	0	3	0	0	3	6
04:30 PM	0	0	3	0	0	3	6
04:45 PM	0	0	2	0	0	3	5
Total	0	0	12	0	0	10	22
05:00 PM	0	0	4	0	0	6	10
05:15 PM	0	0	2	0	0	4	6
05:30 PM	0	0	3	0	0	5	8
05:45 PM	0	0	3	0	0	4	7
Total	0	0	12	0	0	19	31
Grand Total	0	0	24	0	0	29	53
Apprch %	0	0	100	0	0	100	
Total %	0	0	45.3	0	0	54.7	

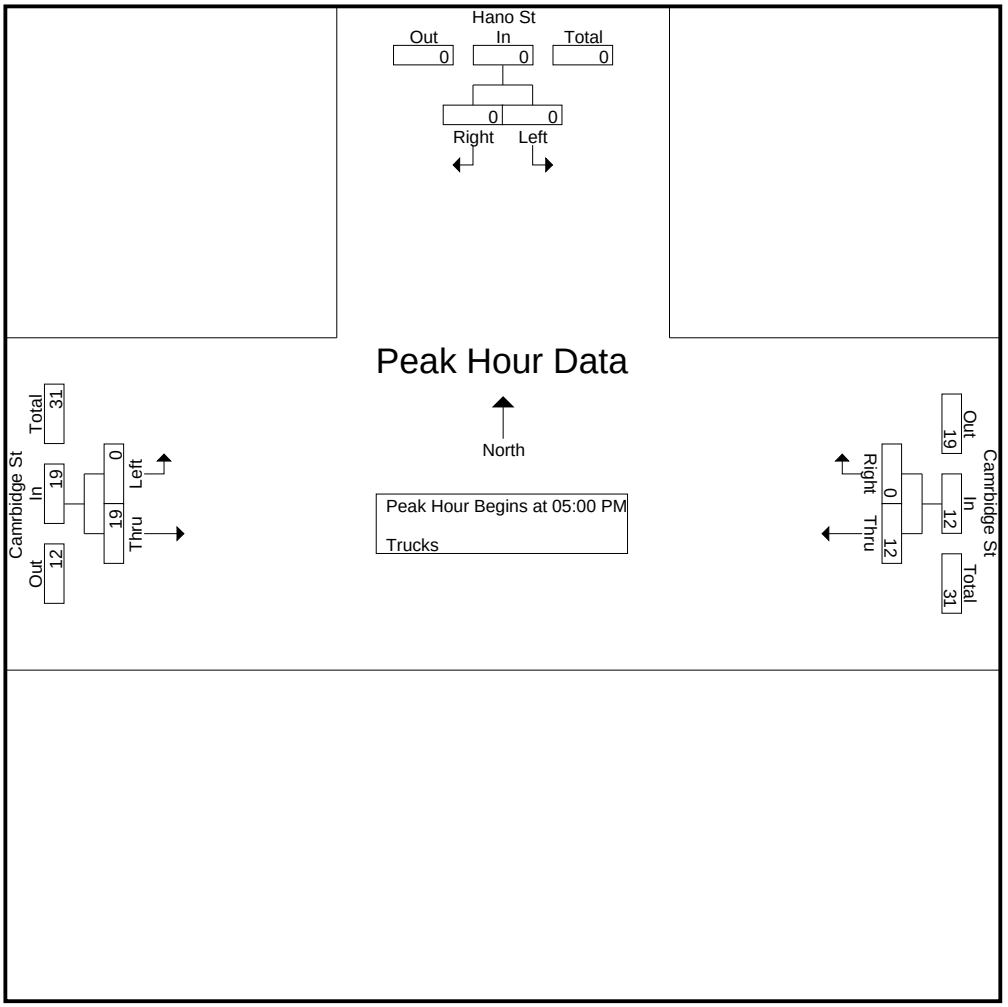
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 8

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	**4**	0	**4**	0	**6**	**6**	**10**
05:15 PM	0	0	0	2	0	2	0	4	4	6
05:30 PM	0	0	0	3	0	3	0	5	5	8
05:45 PM	0	0	0	3	0	3	0	4	4	7
Total Volume	0	0	0	12	0	12	0	19	19	31
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.750	.000	.750	.000	.792	.792	.775



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

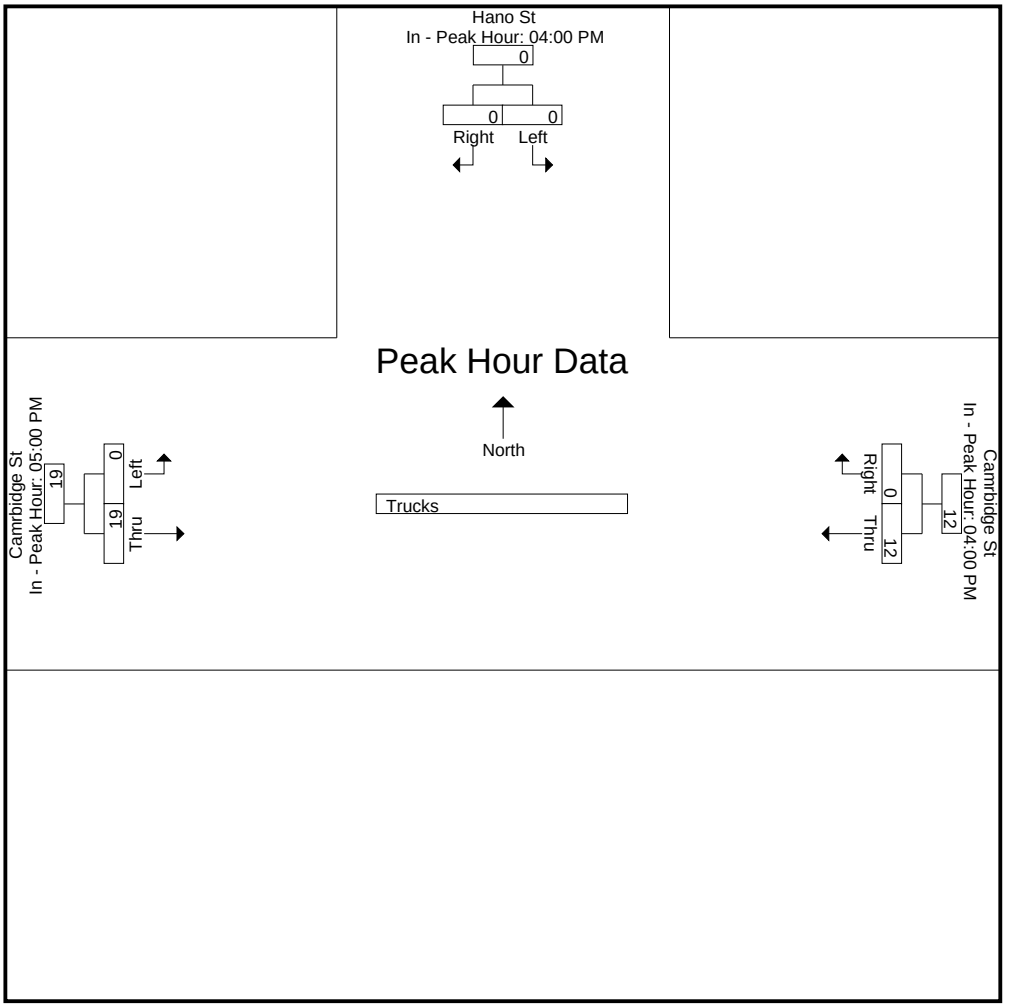
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 9

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			05:00 PM		
+0 mins.	0	0	0	**4**	0	**4**	0	**6**	**6**
+15 mins.	0	0	0	3	0	3	0	4	4
+30 mins.	0	0	0	3	0	3	0	5	5
+45 mins.	0	0	0	2	0	2	0	4	4
Total Volume	0	0	0	12	0	12	0	19	19
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.750	.000	.750	.000	.792	.792



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 10

Groups Printed- Bikes Peds

	Hano St From North			Camrbidge St From East			Camrbidge St From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	22	0	0	10	0	2	0	32	2	34
04:15 PM	0	0	15	2	0	11	0	1	0	26	3	29
04:30 PM	0	0	19	8	0	16	1	0	0	35	9	44
04:45 PM	0	0	11	1	0	8	0	1	0	19	2	21
Total	0	0	67	11	0	45	1	4	0	112	16	128
05:00 PM	0	0	14	3	1	14	0	1	0	28	5	33
05:15 PM	0	0	12	3	0	24	0	1	6	42	4	46
05:30 PM	1	1	12	1	2	6	0	0	1	19	5	24
05:45 PM	0	0	17	5	0	17	0	0	0	34	5	39
Total	1	1	55	12	3	61	0	2	7	123	19	142
Grand Total	1	1	122	23	3	106	1	6	7	235	35	270
Apprch %	50	50		88.5	11.5		14.3	85.7				
Total %	2.9	2.9		65.7	8.6		2.9	17.1		87	13	

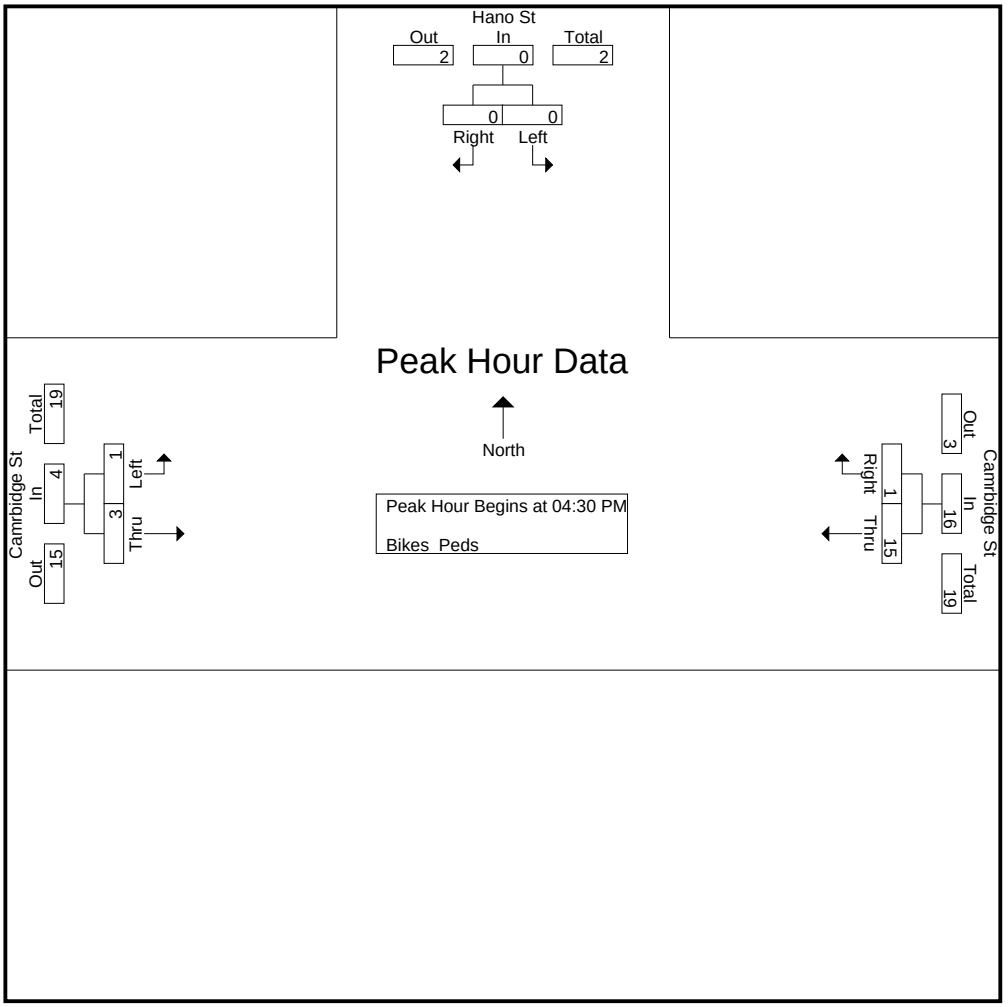
Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 11

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	**8**	0	**8**	**1**	0	**1**	**9**
04:45 PM	0	0	0	1	0	1	0	**1**	1	2
05:00 PM	0	0	0	3	**1**	4	0	1	1	5
05:15 PM	0	0	0	3	0	3	0	1	1	4
Total Volume	0	0	0	15	1	16	1	3	4	20
% App. Total	0	0		93.8	6.2		25	75		
PHF	.000	.000	.000	.469	.250	.500	.250	.750	1.00	.556



Accurate Counts

978-664-2565

N/S Street : Hano Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

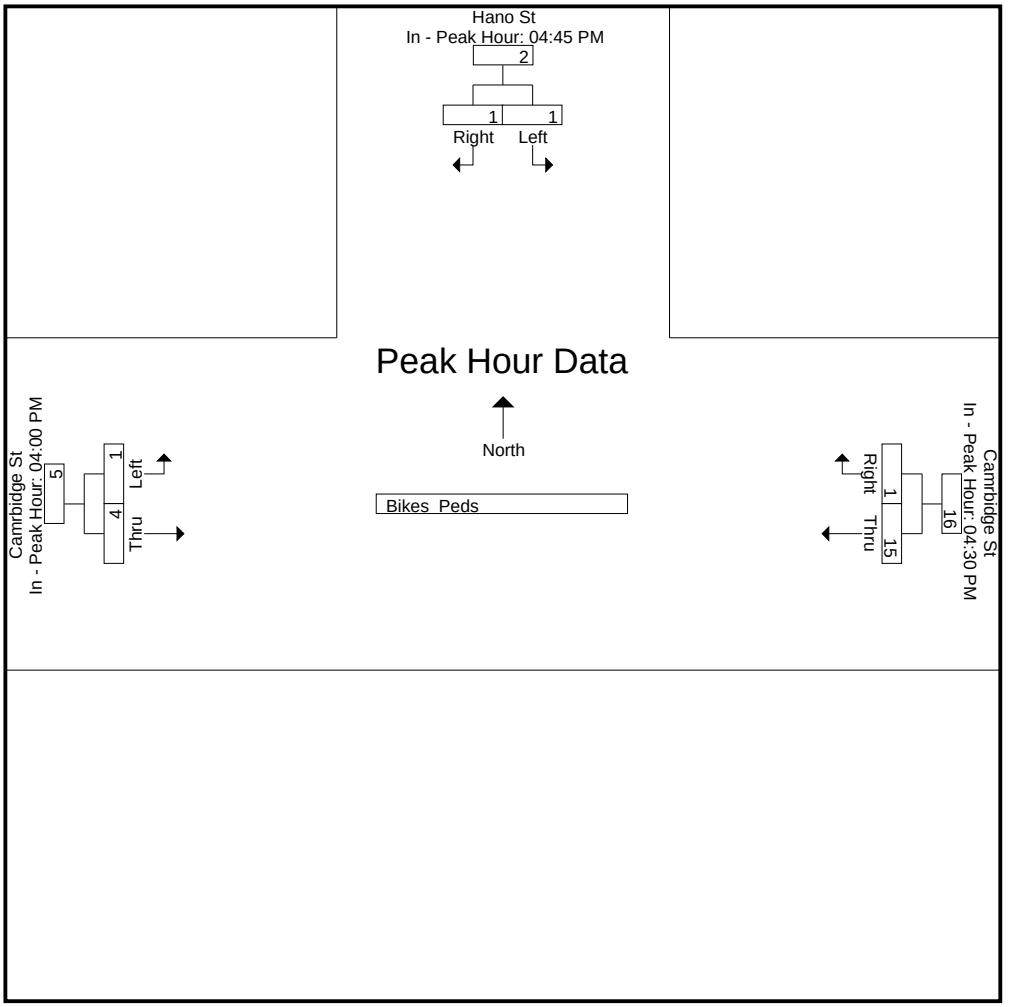
File Name : 17620001
Site Code : 17620001
Start Date : 4/13/2017
Page No : 12

	Hano St From North			Camrbidge St From East			Camrbidge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM			04:30 PM			04:00 PM		
+0 mins.	0	0	0	**8**	0	**8**	0	**2**	**2**
+15 mins.	0	0	0	1	0	1	0	1	1
+30 mins.	0	0	0	3	**1**	4	**1**	0	1
+45 mins.	**1**	**1**	**2**	3	0	3	0	1	1
Total Volume	1	1	2	15	1	16	1	4	5
% App. Total	50	50		93.8	6.2		20	80	
PHF	.250	.250	.250	.469	.250	.500	.250	.500	.625



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Denby St From North		Cambridge St From East		Cambridge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	2	1	121	3	2	108	237
07:15 AM	1	4	129	3	2	112	251
07:30 AM	2	6	93	2	0	93	196
07:45 AM	0	0	117	2	4	107	230
Total	5	11	460	10	8	420	914
08:00 AM	0	3	130	5	2	106	246
08:15 AM	1	2	121	1	3	104	232
08:30 AM	1	7	118	6	4	113	249
08:45 AM	0	0	102	4	5	92	203
Total	2	12	471	16	14	415	930
Grand Total	7	23	931	26	22	835	1844
Apprch %	23.3	76.7	97.3	2.7	2.6	97.4	
Total %	0.4	1.2	50.5	1.4	1.2	45.3	
Cars	7	23	877	26	22	798	1753
% Cars	100	100	94.2	100	100	95.6	95.1
Trucks	0	0	54	0	0	37	91
% Trucks	0	0	5.8	0	0	4.4	4.9

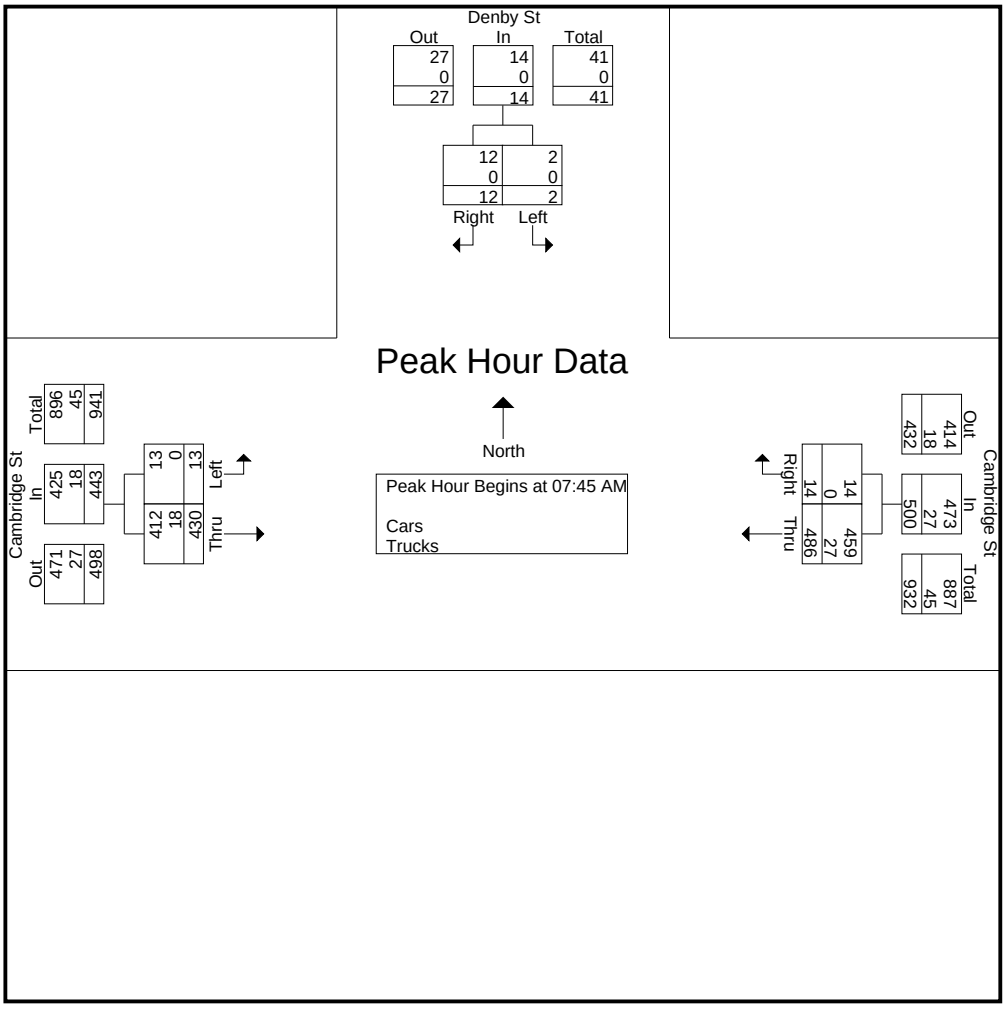
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 2

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	117	2	119	**4**	107	111	230
08:00 AM	0	3	3	**130**	5	**135**	2	106	108	246
08:15 AM	**1**	2	3	121	1	122	3	104	107	232
08:30 AM	1	**7**	**8**	118	**6**	124	4	**113**	**117**	**249**
Total Volume	2	12	14	486	14	500	13	430	443	957
% App. Total	14.3	85.7		97.2	2.8		2.9	97.1		
PHF	.500	.429	.438	.935	.583	.926	.813	.951	.947	.961
Cars	2	12	14	459	14	473	13	412	425	912
% Cars	100	100	100	94.4	100	94.6	100	95.8	95.9	95.3
Trucks	0	0	0	27	0	27	0	18	18	45
% Trucks	0	0	0	5.6	0	5.4	0	4.2	4.1	4.7



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

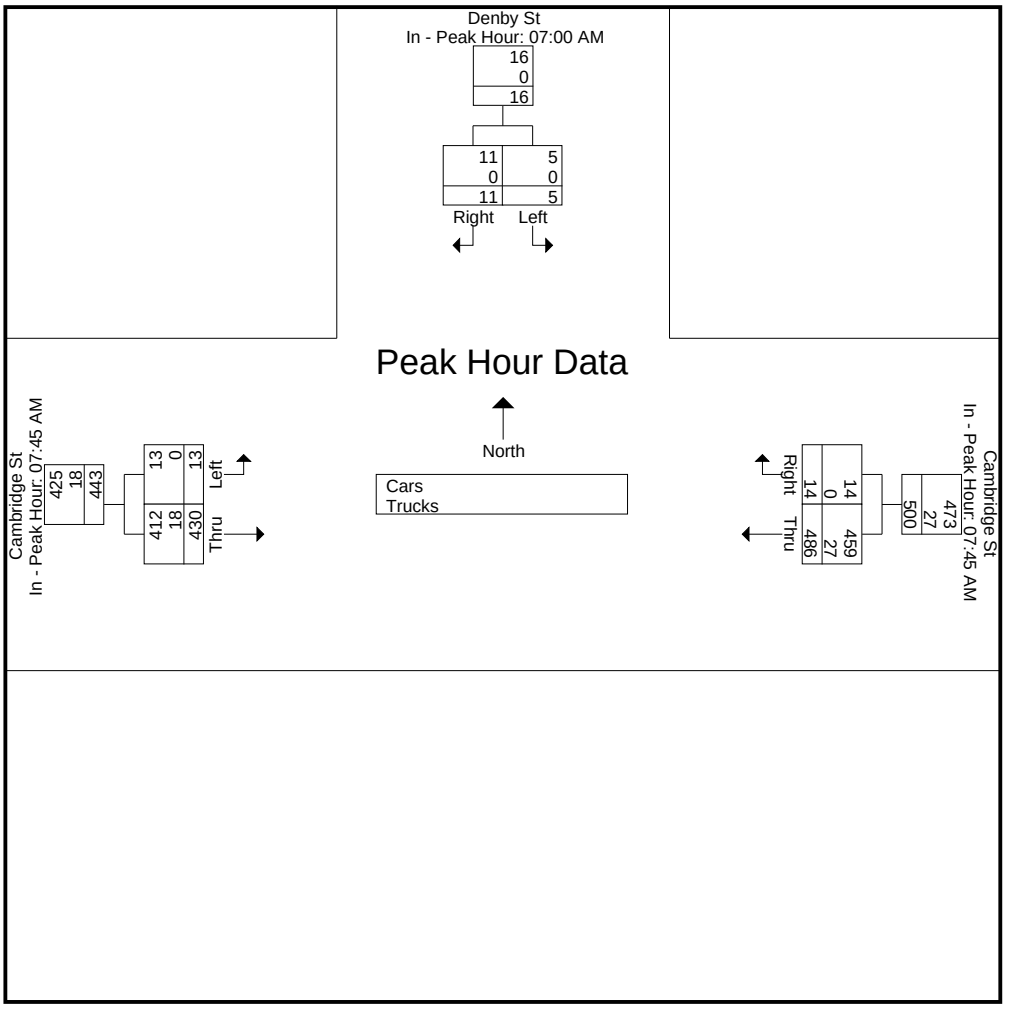
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 3

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:45 AM		
+0 mins.	**2**	1	3	117	2	119	**4**	107	111
+15 mins.	1	4	5	**130**	5	**135**	2	106	108
+30 mins.	2	**6**	**8**	121	1	122	3	104	107
+45 mins.	0	0	0	118	**6**	124	4	**113**	**117**
Total Volume	5	11	16	486	14	500	13	430	443
% App. Total	31.2	68.8		97.2	2.8		2.9	97.1	
PHF	.625	.458	.500	.935	.583	.926	.813	.951	.947
Cars	5	11	16	459	14	473	13	412	425
% Cars	100	100	100	94.4	100	94.6	100	95.8	95.9
Trucks	0	0	0	27	0	27	0	18	18
% Trucks	0	0	0	5.6	0	5.4	0	4.2	4.1



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017

Groups Printed- Cars

	Denby St From North		Cambridge St From East		Cambridge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	2	1	113	3	2	106	227
07:15 AM	1	4	122	3	2	107	239
07:30 AM	2	6	85	2	0	88	183
07:45 AM	0	0	110	2	4	100	216
Total	5	11	430	10	8	401	865
08:00 AM	0	3	124	5	2	103	237
08:15 AM	1	2	111	1	3	98	216
08:30 AM	1	7	114	6	4	111	243
08:45 AM	0	0	98	4	5	85	192
Total	2	12	447	16	14	397	888
Grand Total	7	23	877	26	22	798	1753
Apprch %	23.3	76.7	97.1	2.9	2.7	97.3	
Total %	0.4	1.3	50	1.5	1.3	45.5	

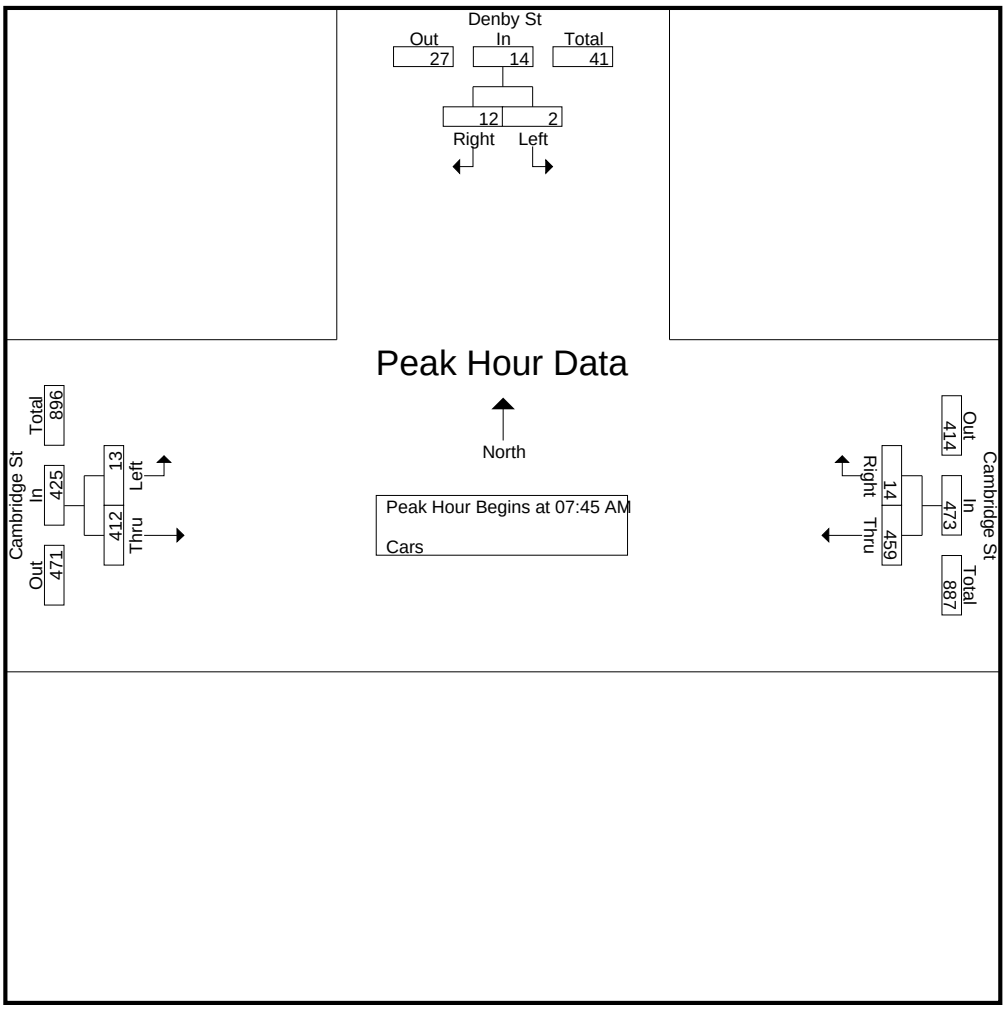
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 5

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	110	2	112	**4**	100	104	216
08:00 AM	0	3	3	**124**	5	**129**	2	103	105	237
08:15 AM	**1**	2	3	111	1	112	3	98	101	216
08:30 AM	1	**7**	**8**	114	**6**	120	4	**111**	**115**	**243**
Total Volume	2	12	14	459	14	473	13	412	425	912
% App. Total	14.3	85.7		97	3		3.1	96.9		
PHF	.500	.429	.438	.925	.583	.917	.813	.928	.924	.938



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

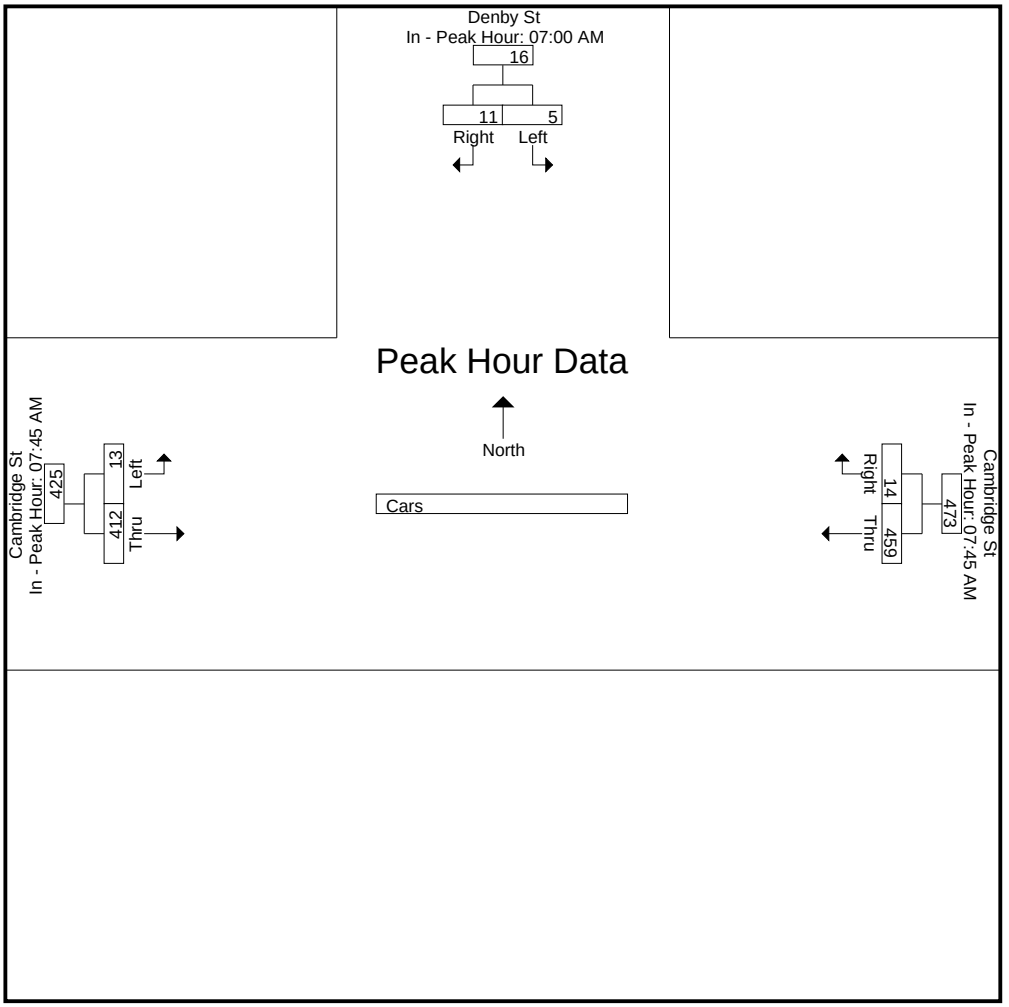
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 6

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:45 AM		
+0 mins.	**2**	1	3	110	2	112	**4**	100	104
+15 mins.	1	4	5	**124**	5	**129**	2	103	105
+30 mins.	2	**6**	**8**	111	1	112	3	98	101
+45 mins.	0	0	0	114	**6**	120	4	**111**	**115**
Total Volume	5	11	16	459	14	473	13	412	425
% App. Total	31.2	68.8		97	3		3.1	96.9	
PHF	.625	.458	.500	.925	.583	.917	.813	.928	.924



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017

Groups Printed- Trucks

	Denby St From North		Cambridge St From East		Cambridge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	0	8	0	0	2	10
07:15 AM	0	0	7	0	0	5	12
07:30 AM	0	0	8	0	0	5	13
07:45 AM	0	0	7	0	0	7	14
Total	0	0	30	0	0	19	49
08:00 AM	0	0	6	0	0	3	9
08:15 AM	0	0	10	0	0	6	16
08:30 AM	0	0	4	0	0	2	6
08:45 AM	0	0	4	0	0	7	11
Total	0	0	24	0	0	18	42
Grand Total	0	0	54	0	0	37	91
Apprch %	0	0	100	0	0	100	
Total %	0	0	59.3	0	0	40.7	

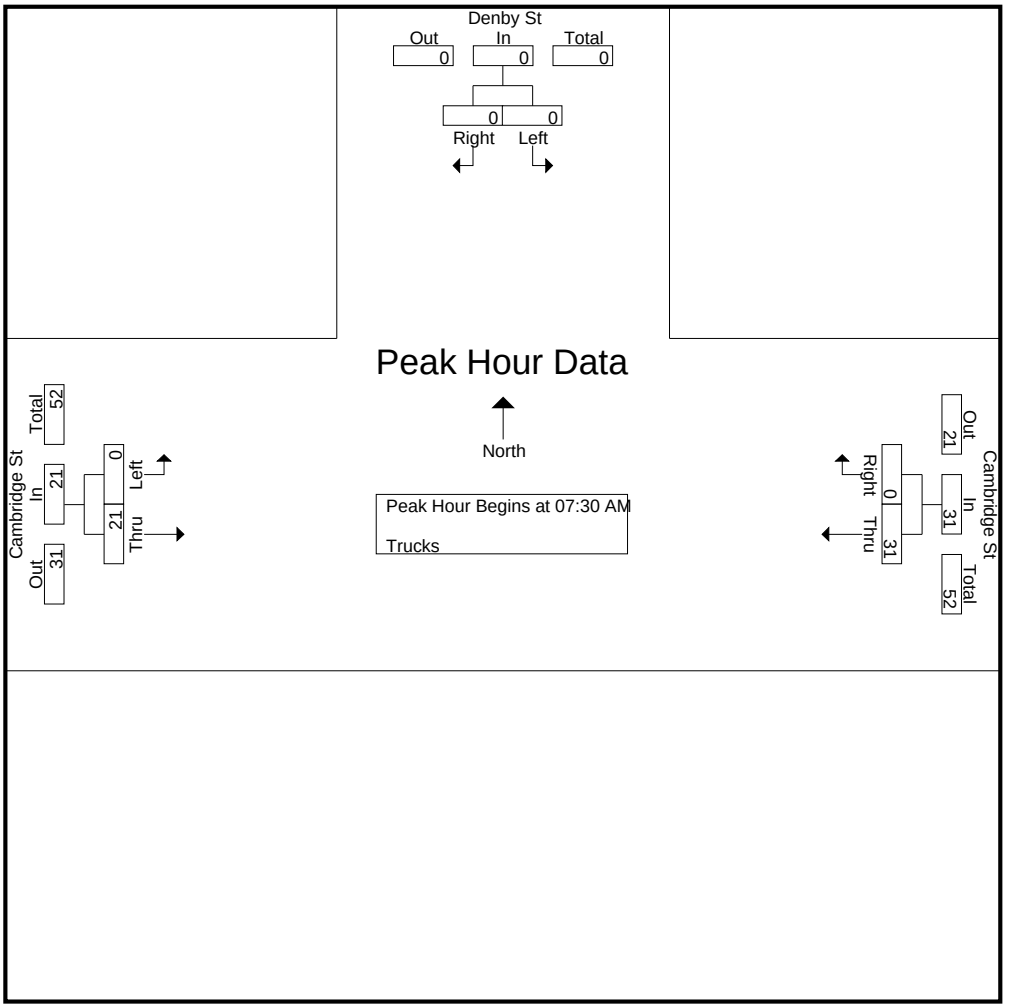
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 8

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	0	0	8	0	8	0	5	5	13
07:45 AM	0	0	0	7	0	7	0	**7**	**7**	14
08:00 AM	0	0	0	6	0	6	0	3	3	9
08:15 AM	0	0	0	**10**	0	**10**	0	6	6	**16**
Total Volume	0	0	0	31	0	31	0	21	21	52
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.775	.000	.775	.000	.750	.750	.813



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

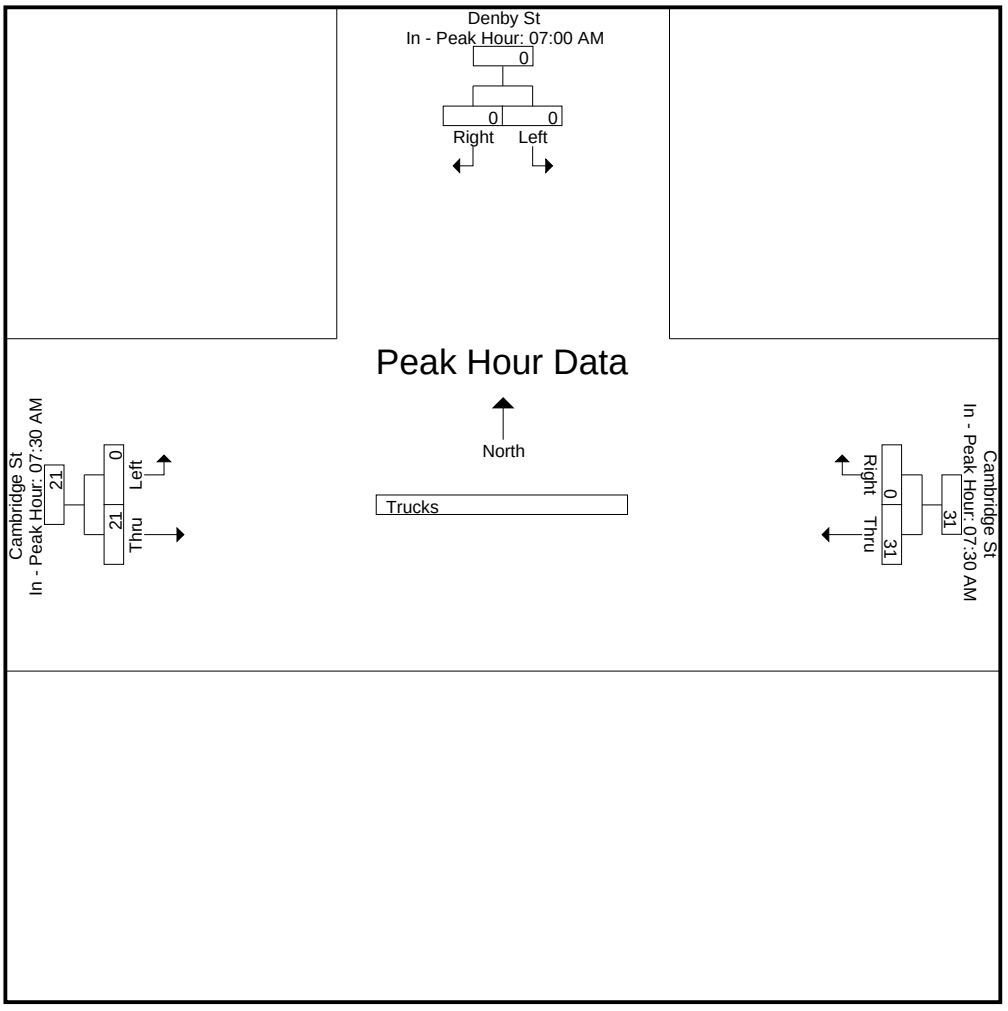
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 9

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:30 AM			07:30 AM		
+0 mins.	0	0	0	8	0	8	0	5	5
+15 mins.	0	0	0	7	0	7	0	**7**	**7**
+30 mins.	0	0	0	6	0	6	0	3	3
+45 mins.	0	0	0	**10**	0	**10**	0	6	6
Total Volume	0	0	0	31	0	31	0	21	21
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.775	.000	.775	.000	.750	.750



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
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Groups Printed- Bikes Peds

	Denby St From North			Cambridge St From East			Cambridge St From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	13	2	0	4	0	1	0	17	3	20
07:15 AM	0	0	3	0	0	2	0	2	0	5	2	7
07:30 AM	0	0	13	0	0	2	0	2	0	15	2	17
07:45 AM	0	0	2	4	0	2	0	4	1	5	8	13
Total	0	0	31	6	0	10	0	9	1	42	15	57
08:00 AM	1	0	8	0	0	4	0	6	2	14	7	21
08:15 AM	0	0	5	1	0	10	0	12	3	18	13	31
08:30 AM	0	0	3	0	0	1	0	3	1	5	3	8
08:45 AM	0	0	0	3	0	3	0	9	1	4	12	16
Total	1	0	16	4	0	18	0	30	7	41	35	76
Grand Total	1	0	47	10	0	28	0	39	8	83	50	133
Apprch %	100	0		100	0		0	100				
Total %	2	0		20	0		0	78		62.4	37.6	

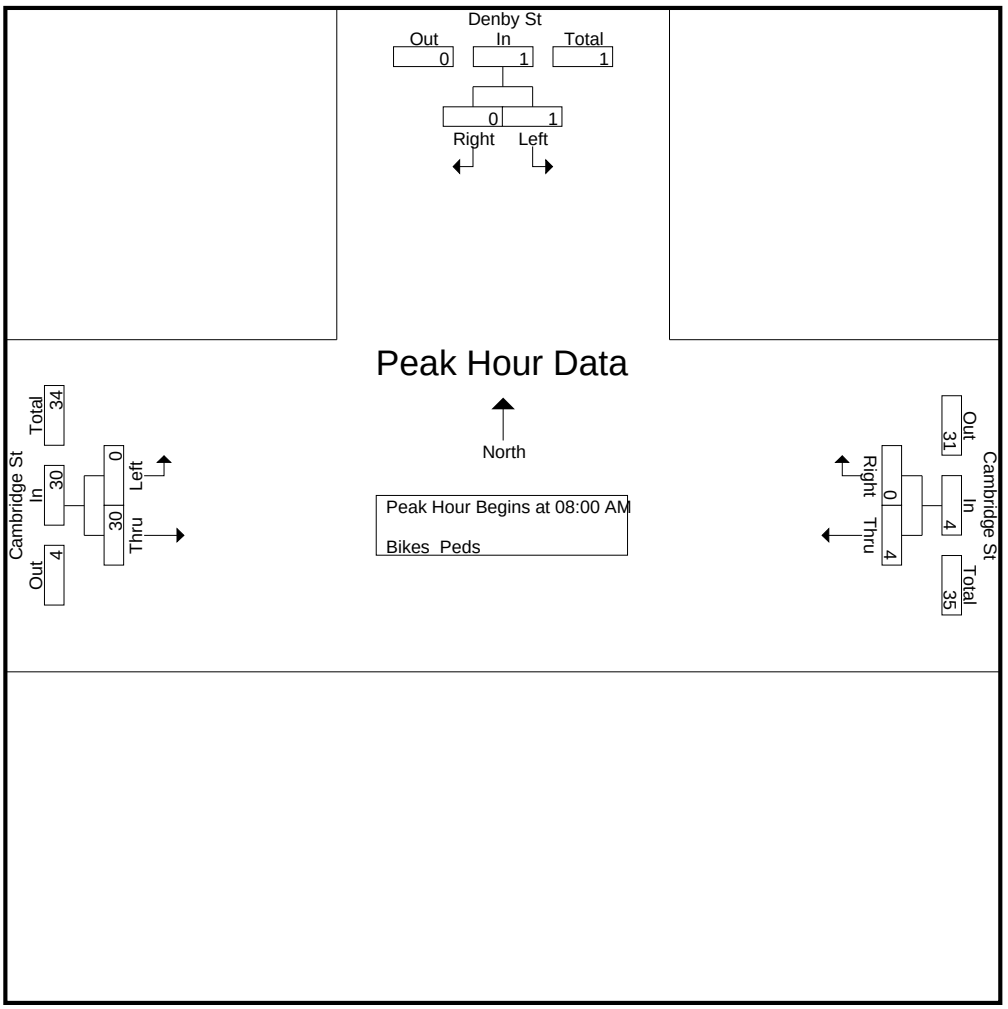
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 11

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**1**	0	**1**	0	0	0	0	6	6	7
08:15 AM	0	0	0	1	0	1	0	**12**	**12**	**13**
08:30 AM	0	0	0	0	0	0	0	3	3	3
08:45 AM	0	0	0	**3**	0	**3**	0	9	9	12
Total Volume	1	0	1	4	0	4	0	30	30	35
% App. Total	100	0		100	0		0	100		
PHF	.250	.000	.250	.333	.000	.333	.000	.625	.625	.673



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

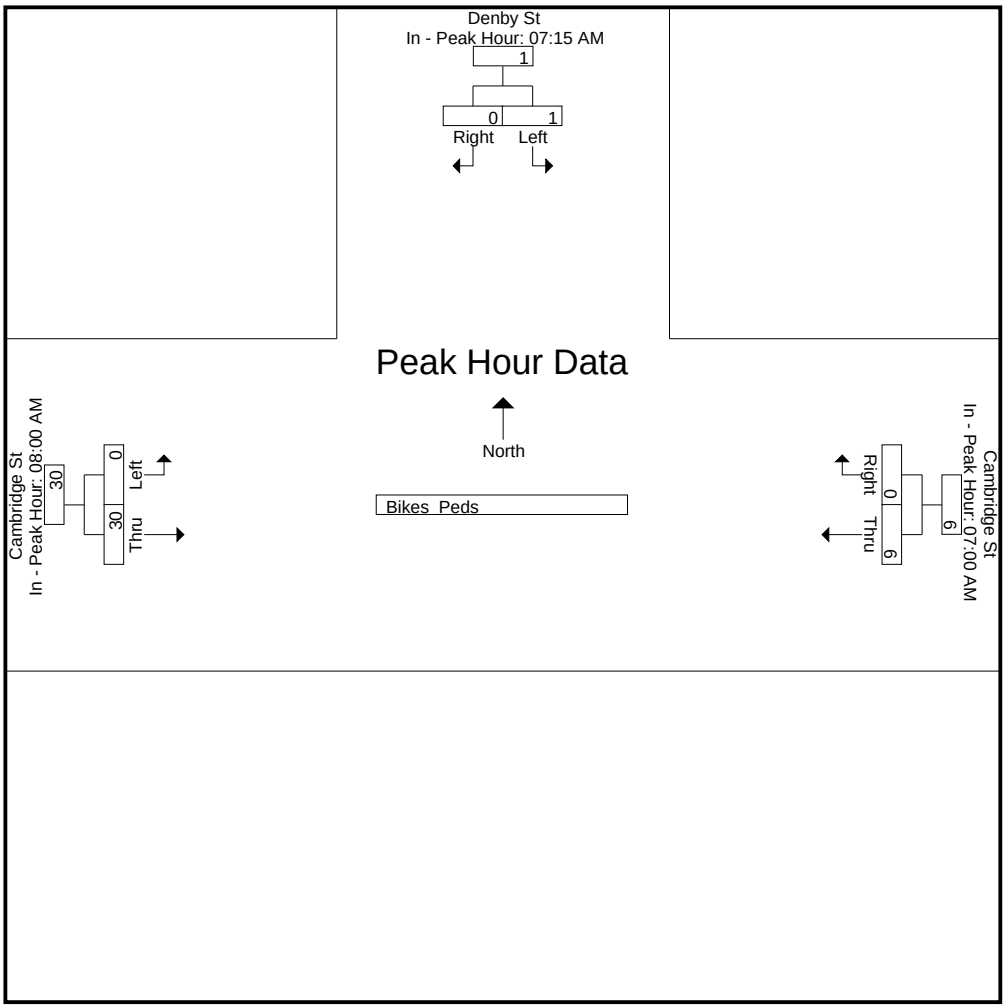
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 12

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			08:00 AM		
+0 mins.	0	0	0	2	0	2	0	6	6
+15 mins.	0	0	0	0	0	0	0	**12**	**12**
+30 mins.	0	0	0	0	0	0	0	3	3
+45 mins.	**1**	0	**1**	**4**	0	**4**	0	9	9
Total Volume	1	0	1	6	0	6	0	30	30
% App. Total	100	0		100	0		0	100	
PHF	.250	.000	.250	.375	.000	.375	.000	.625	.625



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Denby St From North		Cambridge St From East		Cambridge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	5	1	135	8	7	122	278
04:15 PM	2	5	139	0	2	125	273
04:30 PM	0	3	133	6	3	116	261
04:45 PM	0	4	147	3	1	130	285
Total	7	13	554	17	13	493	1097
05:00 PM	1	4	162	3	4	129	303
05:15 PM	3	5	153	4	4	112	281
05:30 PM	2	6	152	2	1	110	273
05:45 PM	0	3	167	2	5	113	290
Total	6	18	634	11	14	464	1147
Grand Total	13	31	1188	28	27	957	2244
Apprch %	29.5	70.5	97.7	2.3	2.7	97.3	
Total %	0.6	1.4	52.9	1.2	1.2	42.6	
Cars	13	31	1166	28	27	928	2193
% Cars	100	100	98.1	100	100	97	97.7
Trucks	0	0	22	0	0	29	51
% Trucks	0	0	1.9	0	0	3	2.3

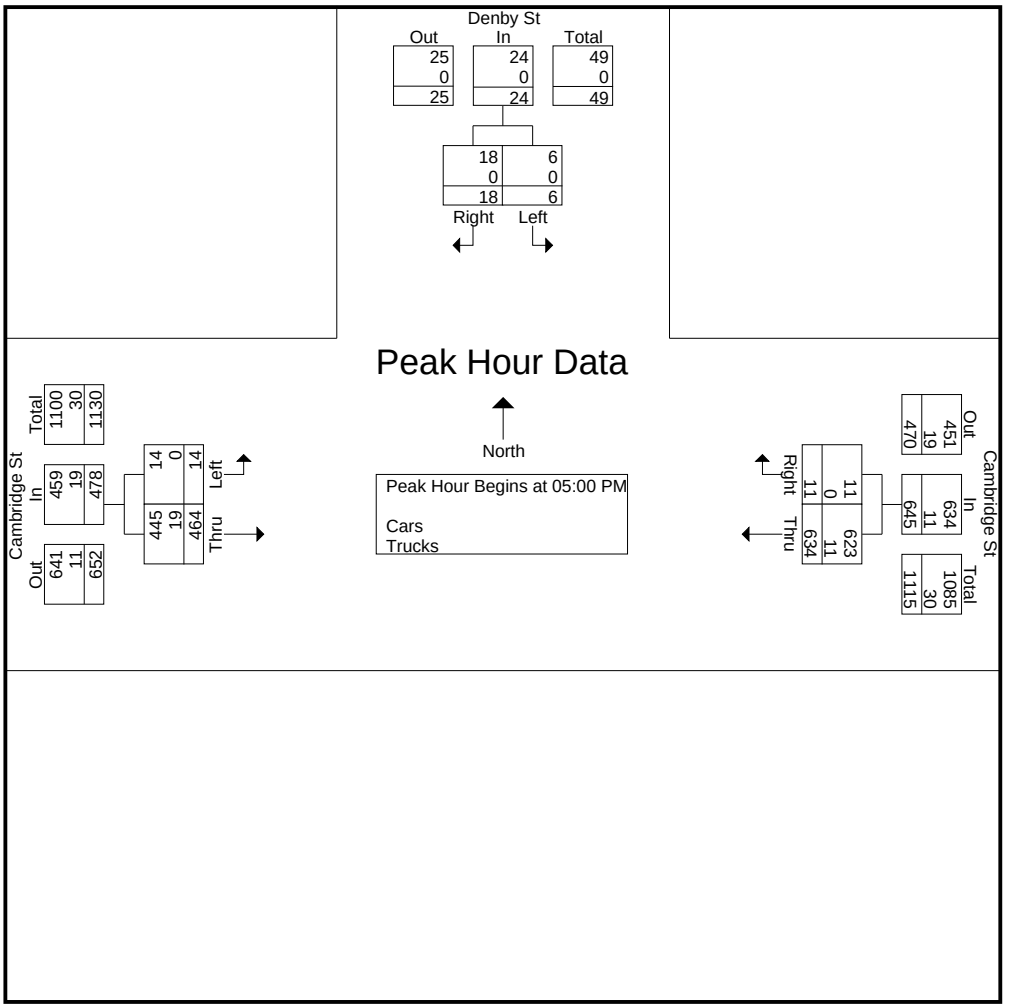
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 2

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	1	4	5	162	3	165	4	**129**	**133**	**303**
05:15 PM	**3**	5	**8**	153	**4**	157	4	112	116	281
05:30 PM	2	**6**	8	152	2	154	1	110	111	273
05:45 PM	0	3	3	**167**	2	**169**	**5**	113	118	290
Total Volume	6	18	24	634	11	645	14	464	478	1147
% App. Total	25	75		98.3	1.7		2.9	97.1		
PHF	.500	.750	.750	.949	.688	.954	.700	.899	.898	.946
Cars	6	18	24	623	11	634	14	445	459	1117
% Cars	100	100	100	98.3	100	98.3	100	95.9	96.0	97.4
Trucks	0	0	0	11	0	11	0	19	19	30
% Trucks	0	0	0	1.7	0	1.7	0	4.1	4.0	2.6



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

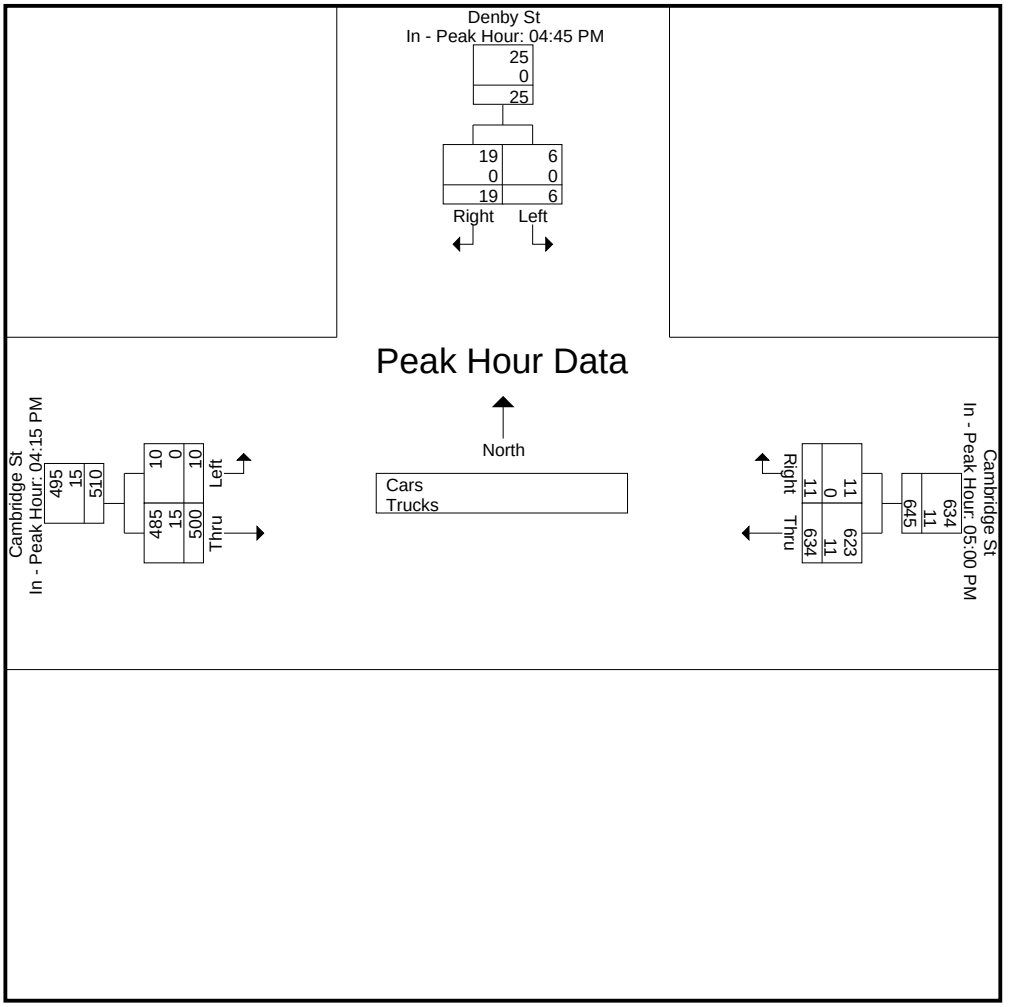
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 3

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM			05:00 PM			04:15 PM		
+0 mins.	0	4	4	162	3	165	2	125	127
+15 mins.	1	4	5	153	**4**	157	3	116	119
+30 mins.	**3**	5	**8**	152	2	154	1	**130**	131
+45 mins.	2	**6**	8	**167**	2	**169**	**4**	129	**133**
Total Volume	6	19	25	634	11	645	10	500	510
% App. Total	24	76		98.3	1.7		2	98	
PHF	.500	.792	.781	.949	.688	.954	.625	.962	.959
Cars	6	19	25	623	11	634	10	485	495
% Cars	100	100	100	98.3	100	98.3	100	97	97.1
Trucks	0	0	0	11	0	11	0	15	15
% Trucks	0	0	0	1.7	0	1.7	0	3	2.9



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017

Groups Printed- Cars

	Denby St From North		Cambridge St From East		Cambridge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	5	1	131	8	7	121	273
04:15 PM	2	5	137	0	2	123	269
04:30 PM	0	3	130	6	3	112	254
04:45 PM	0	4	145	3	1	127	280
Total	7	13	543	17	13	483	1076
05:00 PM	1	4	159	3	4	123	294
05:15 PM	3	5	150	4	4	108	274
05:30 PM	2	6	150	2	1	106	267
05:45 PM	0	3	164	2	5	108	282
Total	6	18	623	11	14	445	1117
Grand Total	13	31	1166	28	27	928	2193
Apprch %	29.5	70.5	97.7	2.3	2.8	97.2	
Total %	0.6	1.4	53.2	1.3	1.2	42.3	

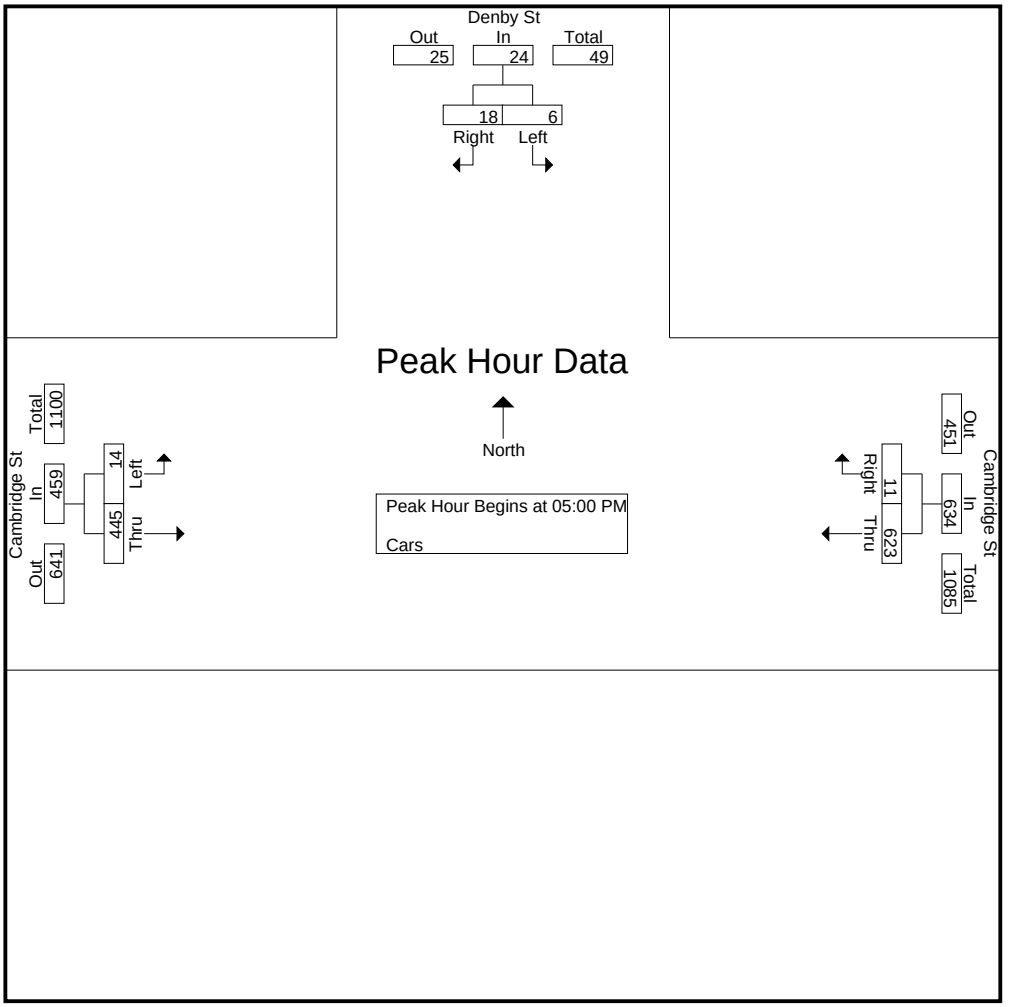
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 5

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	1	4	5	159	3	162	4	**123**	**127**	**294**
05:15 PM	**3**	5	**8**	150	**4**	154	4	108	112	274
05:30 PM	2	**6**	8	150	2	152	1	106	107	267
05:45 PM	0	3	3	**164**	2	**166**	**5**	108	113	282
Total Volume	6	18	24	623	11	634	14	445	459	1117
% App. Total	25	75		98.3	1.7		3.1	96.9		
PHF	.500	.750	.750	.950	.688	.955	.700	.904	.904	.950



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

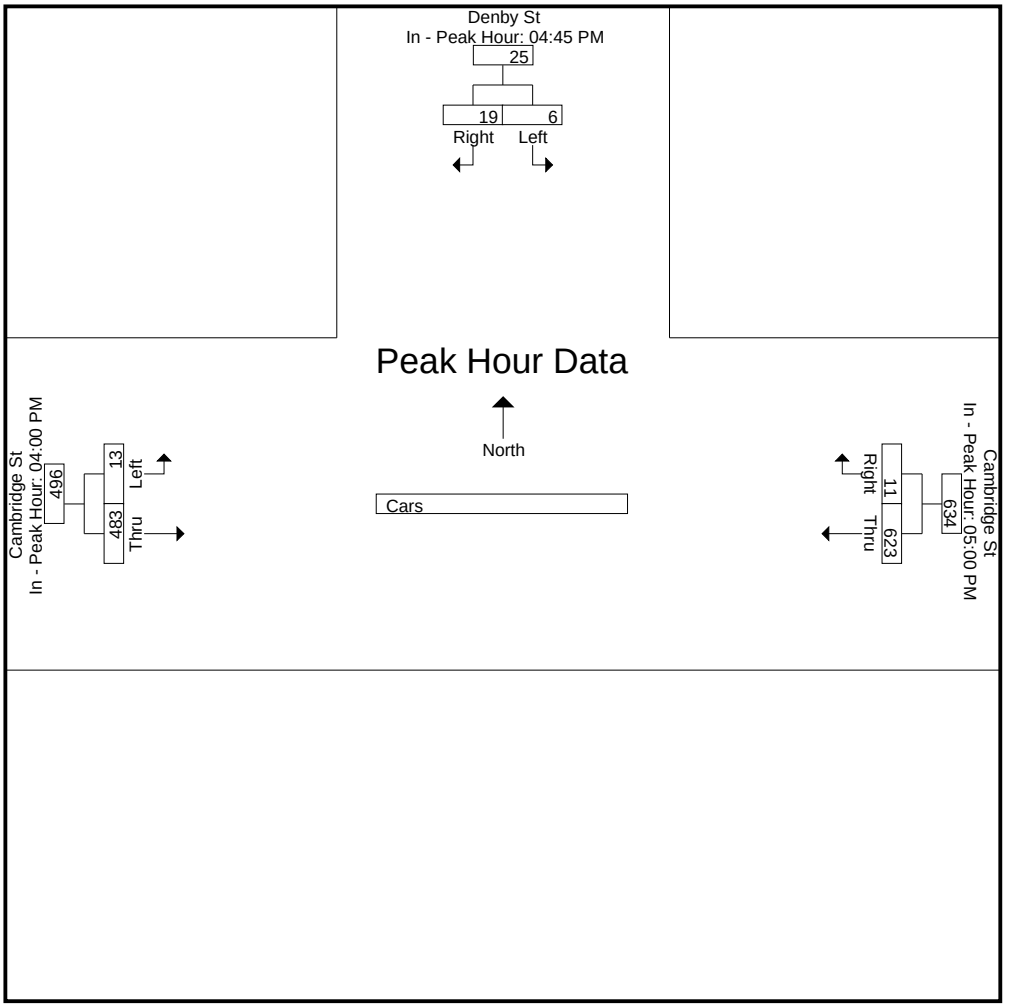
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 6

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM			05:00 PM			04:00 PM		
+0 mins.	0	4	4	159	3	162	**7**	121	**128**
+15 mins.	1	4	5	150	**4**	154	2	123	125
+30 mins.	**3**	5	**8**	150	2	152	3	112	115
+45 mins.	2	**6**	8	**164**	2	**166**	1	**127**	128
Total Volume	6	19	25	623	11	634	13	483	496
% App. Total	24	76		98.3	1.7		2.6	97.4	
PHF	.500	.792	.781	.950	.688	.955	.464	.951	.969



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017

Groups Printed- Trucks

	Denby St From North		Cambridge St From East		Cambridge St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	4	0	0	1	5
04:15 PM	0	0	2	0	0	2	4
04:30 PM	0	0	3	0	0	4	7
04:45 PM	0	0	2	0	0	3	5
Total	0	0	11	0	0	10	21
05:00 PM	0	0	3	0	0	6	9
05:15 PM	0	0	3	0	0	4	7
05:30 PM	0	0	2	0	0	4	6
05:45 PM	0	0	3	0	0	5	8
Total	0	0	11	0	0	19	30
Grand Total	0	0	22	0	0	29	51
Apprch %	0	0	100	0	0	100	
Total %	0	0	43.1	0	0	56.9	

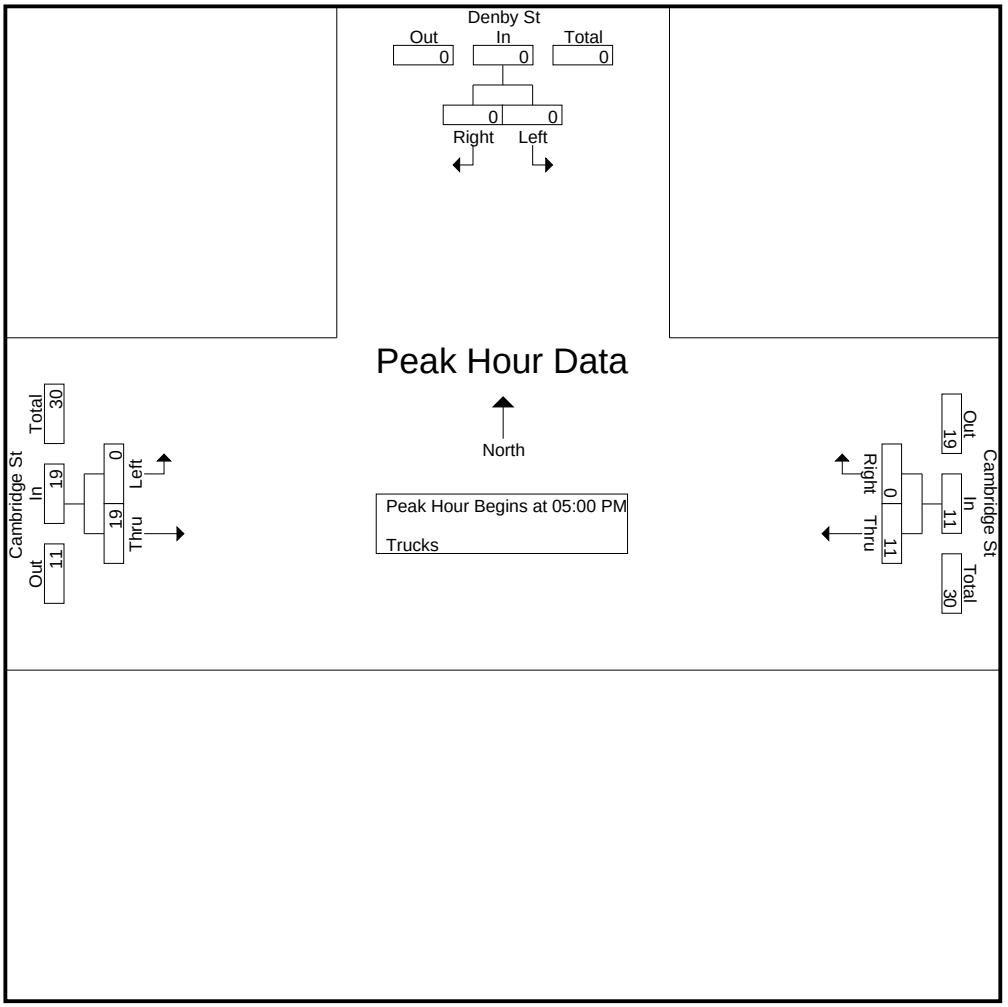
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 8

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	**3**	0	**3**	0	**6**	**6**	**9**
05:15 PM	0	0	0	3	0	3	0	4	4	7
05:30 PM	0	0	0	2	0	2	0	4	4	6
05:45 PM	0	0	0	3	0	3	0	5	5	8
Total Volume	0	0	0	11	0	11	0	19	19	30
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.917	.000	.917	.000	.792	.792	.833



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

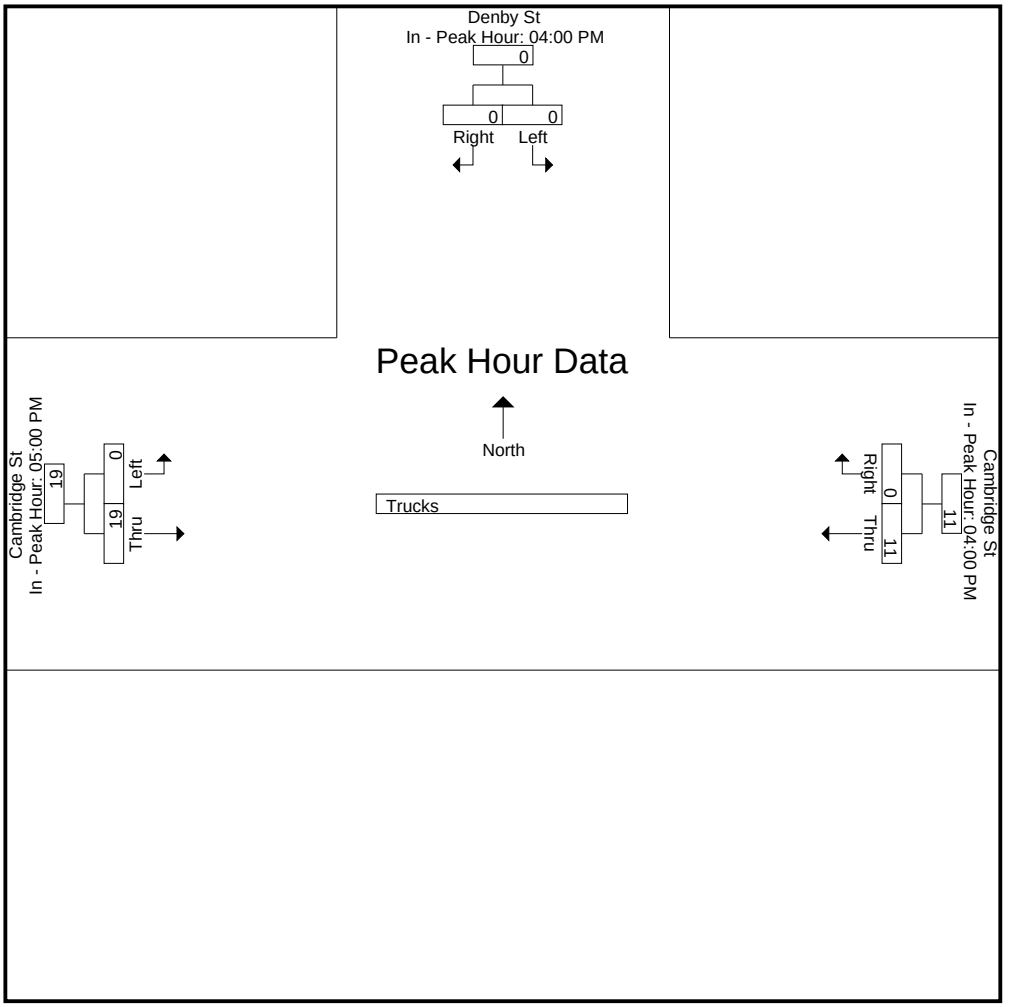
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 9

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			05:00 PM		
+0 mins.	0	0	0	**4**	0	**4**	0	**6**	**6**
+15 mins.	0	0	0	2	0	2	0	4	4
+30 mins.	0	0	0	3	0	3	0	4	4
+45 mins.	0	0	0	2	0	2	0	5	5
Total Volume	0	0	0	11	0	11	0	19	19
% App. Total	0	0		100	0		0	100	
PHF	.000	.000	.000	.688	.000	.688	.000	.792	.792



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 10

Groups Printed- Bikes Peds

	Denby St From North			Cambridge St From East			Cambridge St From West					
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	11	0	0	2	1	3	2	15	4	19
04:15 PM	0	0	4	3	0	4	0	3	0	8	6	14
04:30 PM	0	0	9	7	0	7	0	3	1	17	10	27
04:45 PM	0	0	6	4	0	1	0	1	1	8	5	13
Total	0	0	30	14	0	14	1	10	4	48	25	73
05:00 PM	0	0	8	5	0	5	0	1	0	13	6	19
05:15 PM	0	0	14	4	0	14	0	1	0	28	5	33
05:30 PM	0	1	19	5	0	4	0	4	3	26	10	36
05:45 PM	0	1	23	3	1	4	0	1	2	29	6	35
Total	0	2	64	17	1	27	0	7	5	96	27	123
Grand Total	0	2	94	31	1	41	1	17	9	144	52	196
Apprch %	0	100		96.9	3.1		5.6	94.4				
Total %	0	3.8		59.6	1.9		1.9	32.7		73.5	26.5	

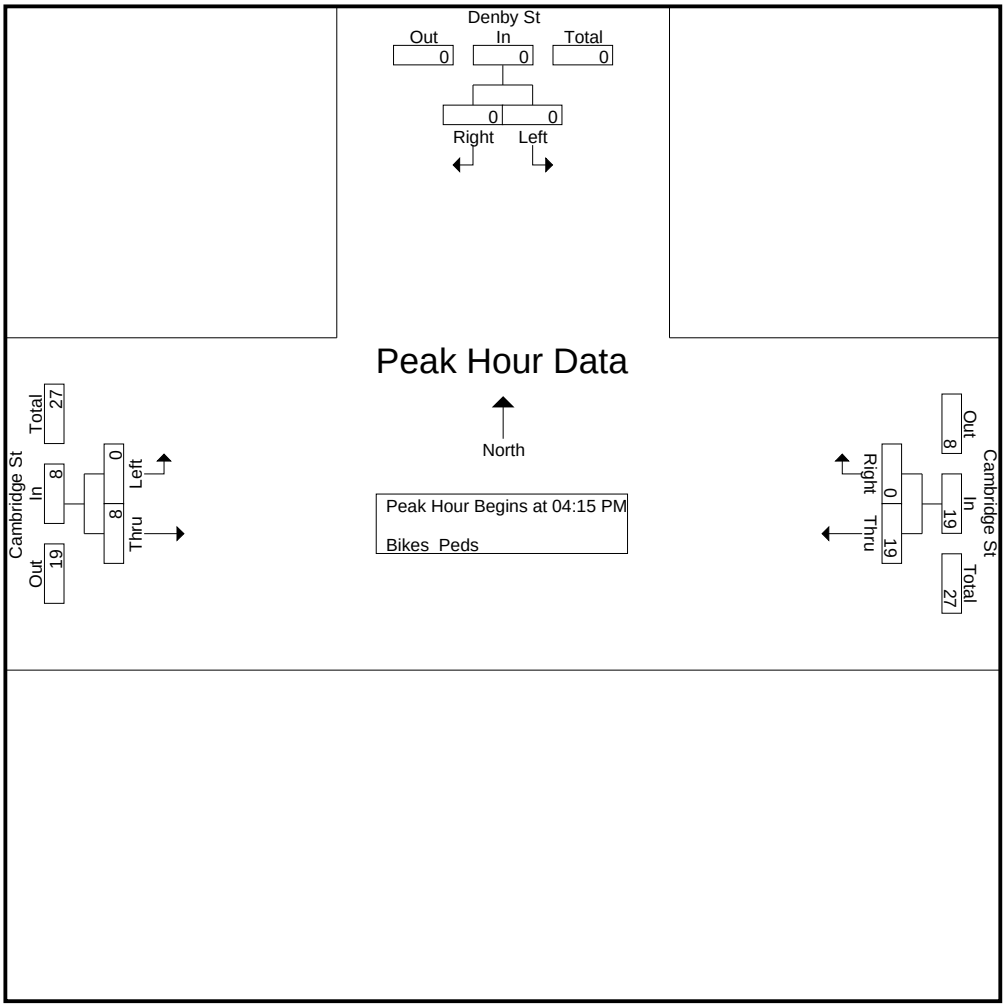
Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 11

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	3	0	3	0	**3**	**3**	6
04:30 PM	0	0	0	**7**	0	**7**	0	3	3	**10**
04:45 PM	0	0	0	4	0	4	0	1	1	5
05:00 PM	0	0	0	5	0	5	0	1	1	6
Total Volume	0	0	0	19	0	19	0	8	8	27
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.679	.000	.679	.000	.667	.667	.675



Accurate Counts

978-664-2565

N/S Street : Denby Street
E/W Street: Cambridge Street
City/State : Allston, MA
Weather : Clear

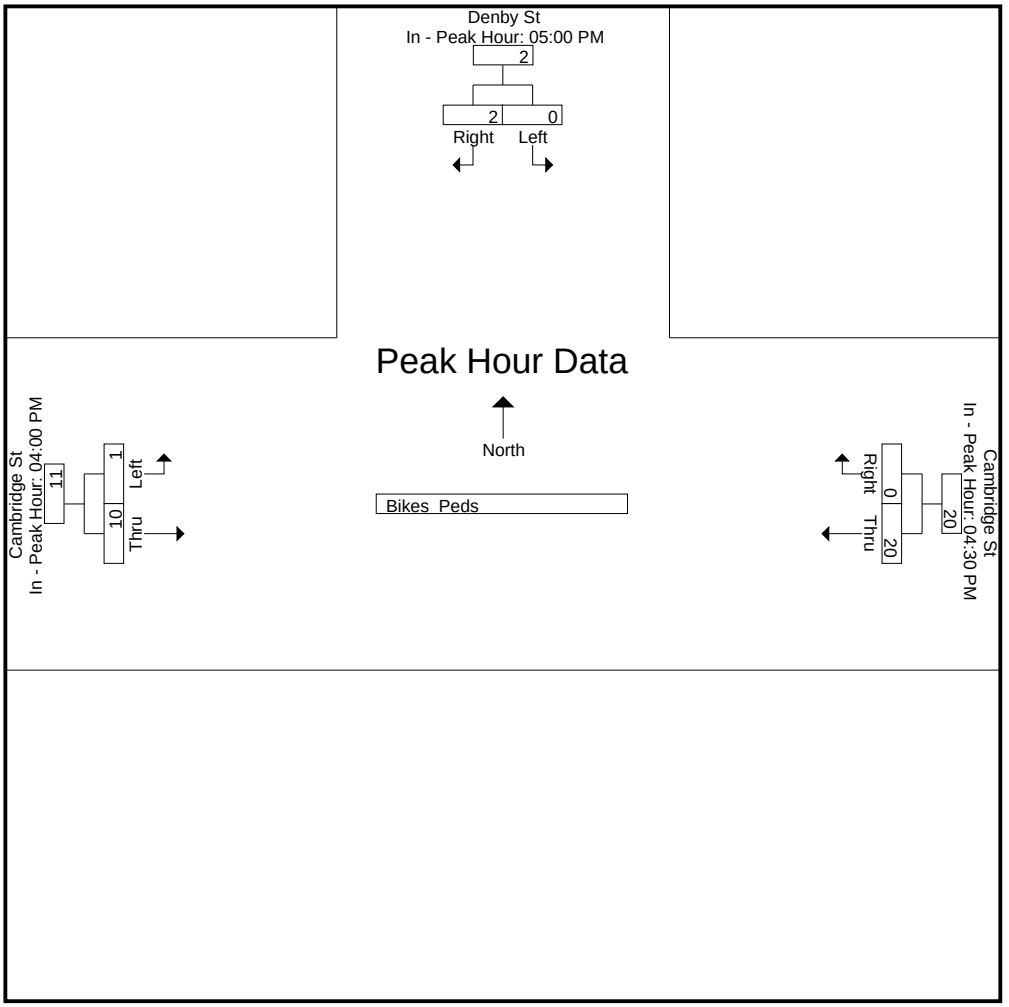
File Name : 17620002
Site Code : 17620002
Start Date : 4/13/2017
Page No : 12

	Denby St From North			Cambridge St From East			Cambridge St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:30 PM			04:00 PM		
+0 mins.	0	0	0	**7**	0	**7**	**1**	**3**	**4**
+15 mins.	0	0	0	4	0	4	0	3	3
+30 mins.	0	**1**	**1**	5	0	5	0	3	3
+45 mins.	0	1	1	4	0	4	0	1	1
Total Volume	0	2	2	20	0	20	1	10	11
% App. Total	0	100		100	0		9.1	90.9	
PHF	.000	.500	.500	.714	.000	.714	.250	.833	.688



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Braintree St From East		Penniman Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	4	18	1	3	13	2	41
07:15 AM	1	17	4	3	11	3	39
07:30 AM	2	15	2	5	22	3	49
07:45 AM	0	19	1	7	20	1	48
Total	7	69	8	18	66	9	177
08:00 AM	2	22	2	4	17	4	51
08:15 AM	0	21	4	6	21	1	53
08:30 AM	3	26	2	8	25	1	65
08:45 AM	4	32	3	9	17	0	65
Total	9	101	11	27	80	6	234
Grand Total	16	170	19	45	146	15	411
Apprch %	8.6	91.4	29.7	70.3	90.7	9.3	
Total %	3.9	41.4	4.6	10.9	35.5	3.6	
Cars	16	170	19	45	146	15	411
% Cars	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

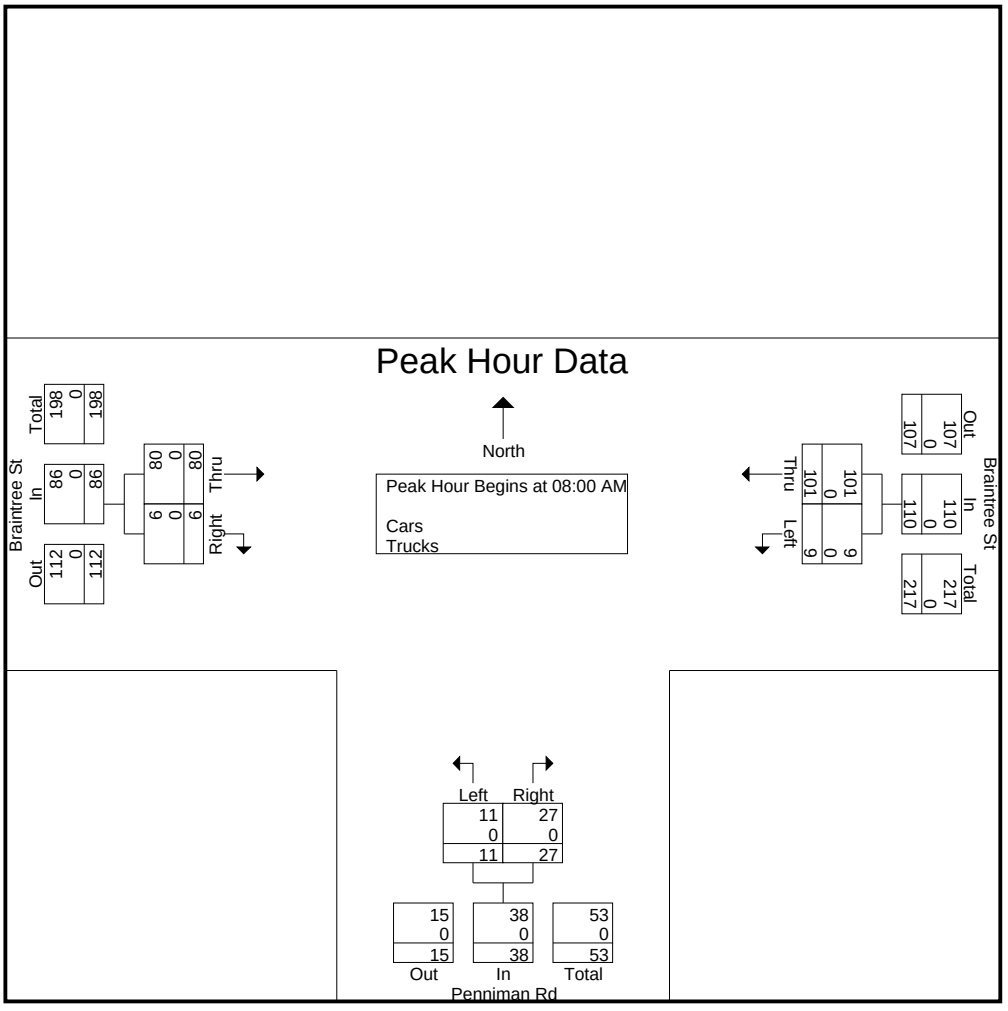
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 2

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	2	22	24	2	4	6	17	**4**	21	51
08:15 AM	0	21	21	**4**	6	10	21	1	22	53
08:30 AM	3	26	29	2	8	10	**25**	1	**26**	**65**
08:45 AM	**4**	**32**	**36**	3	**9**	**12**	17	0	17	65
Total Volume	9	101	110	11	27	38	80	6	86	234
% App. Total	8.2	91.8		28.9	71.1		93	7		
PHF	.563	.789	.764	.688	.750	.792	.800	.375	.827	.900
Cars	9	101	110	11	27	38	80	6	86	234
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

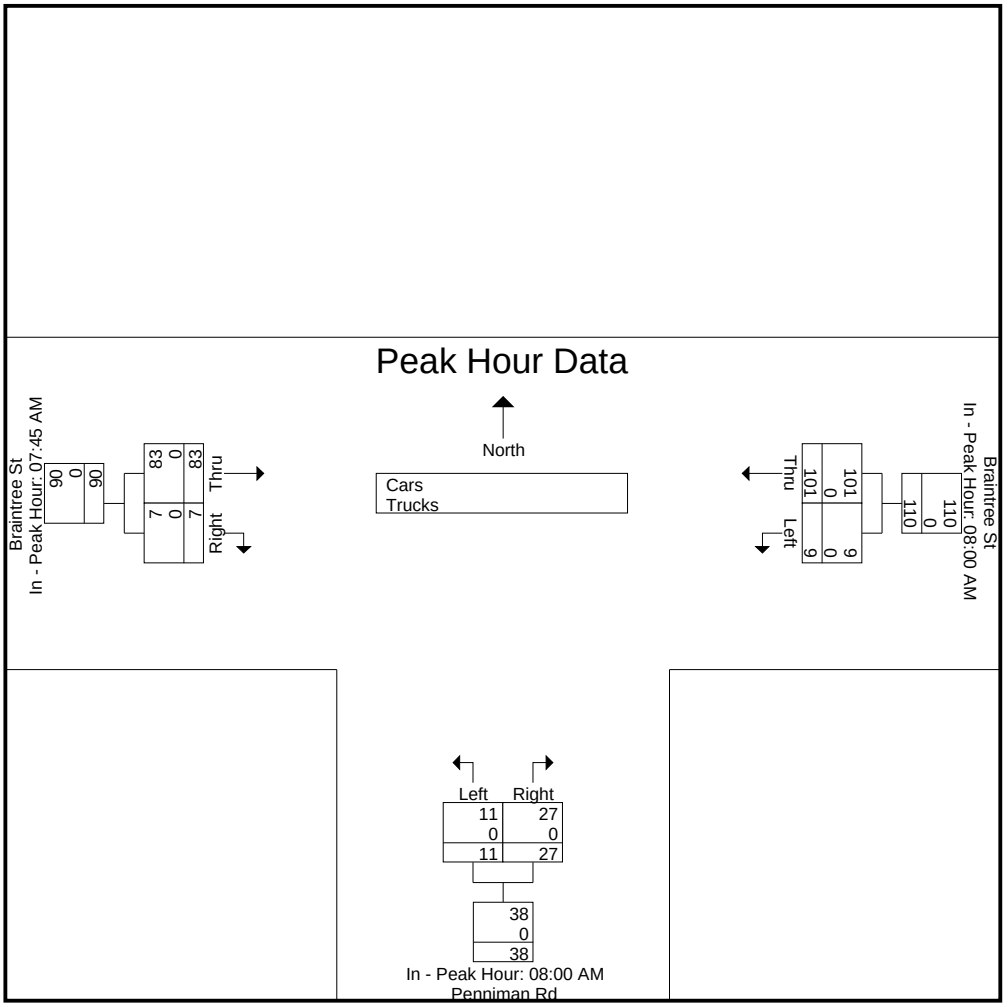
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 3

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:45 AM		
+0 mins.	2	22	24	2	4	6	20	1	21
+15 mins.	0	21	21	**4**	6	10	17	**4**	21
+30 mins.	3	26	29	2	8	10	21	1	22
+45 mins.	**4**	**32**	**36**	3	**9**	**12**	**25**	1	**26**
Total Volume	9	101	110	11	27	38	83	7	90
% App. Total	8.2	91.8		28.9	71.1		92.2	7.8	
PHF	.563	.789	.764	.688	.750	.792	.830	.438	.865
Cars	9	101	110	11	27	38	83	7	90
% Cars	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017

Groups Printed- Cars

	Braintree St From East		Penniman Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	4	18	1	3	13	2	41
07:15 AM	1	17	4	3	11	3	39
07:30 AM	2	15	2	5	22	3	49
07:45 AM	0	19	1	7	20	1	48
Total	7	69	8	18	66	9	177
08:00 AM	2	22	2	4	17	4	51
08:15 AM	0	21	4	6	21	1	53
08:30 AM	3	26	2	8	25	1	65
08:45 AM	4	32	3	9	17	0	65
Total	9	101	11	27	80	6	234
Grand Total	16	170	19	45	146	15	411
Apprch %	8.6	91.4	29.7	70.3	90.7	9.3	
Total %	3.9	41.4	4.6	10.9	35.5	3.6	

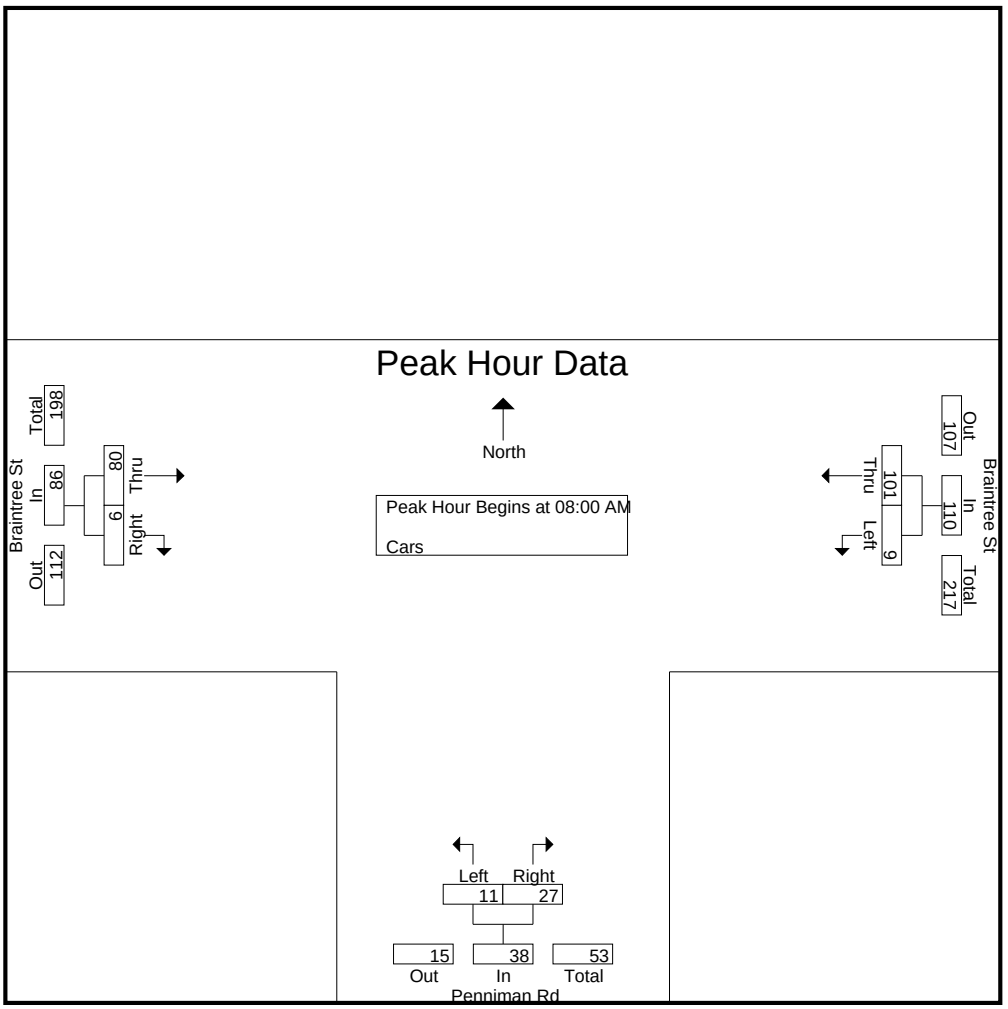
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 5

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	2	22	24	2	4	6	17	**4**	21	51
08:15 AM	0	21	21	**4**	6	10	21	1	22	53
08:30 AM	3	26	29	2	8	10	**25**	1	**26**	**65**
08:45 AM	**4**	**32**	**36**	3	**9**	**12**	17	0	17	65
Total Volume	9	101	110	11	27	38	80	6	86	234
% App. Total	8.2	91.8		28.9	71.1		93	7		
PHF	.563	.789	.764	.688	.750	.792	.800	.375	.827	.900



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

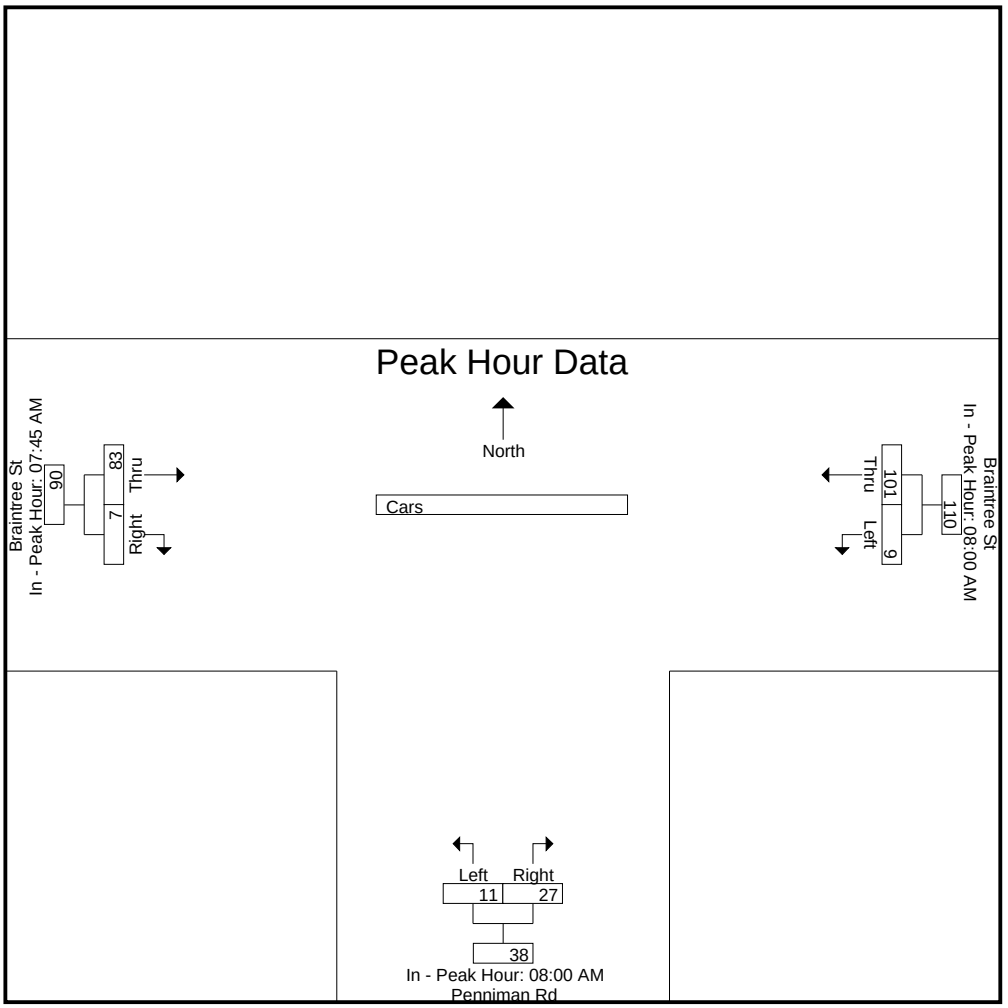
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 6

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:45 AM		
+0 mins.	2	22	24	2	4	6	20	1	21
+15 mins.	0	21	21	**4**	6	10	17	**4**	21
+30 mins.	3	26	29	2	8	10	21	1	22
+45 mins.	**4**	**32**	**36**	3	**9**	**12**	**25**	1	**26**
Total Volume	9	101	110	11	27	38	83	7	90
% App. Total	8.2	91.8		28.9	71.1		92.2	7.8	
PHF	.563	.789	.764	.688	.750	.792	.830	.438	.865



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017

Groups Printed- Trucks

	Braintree St From East		Penniman Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

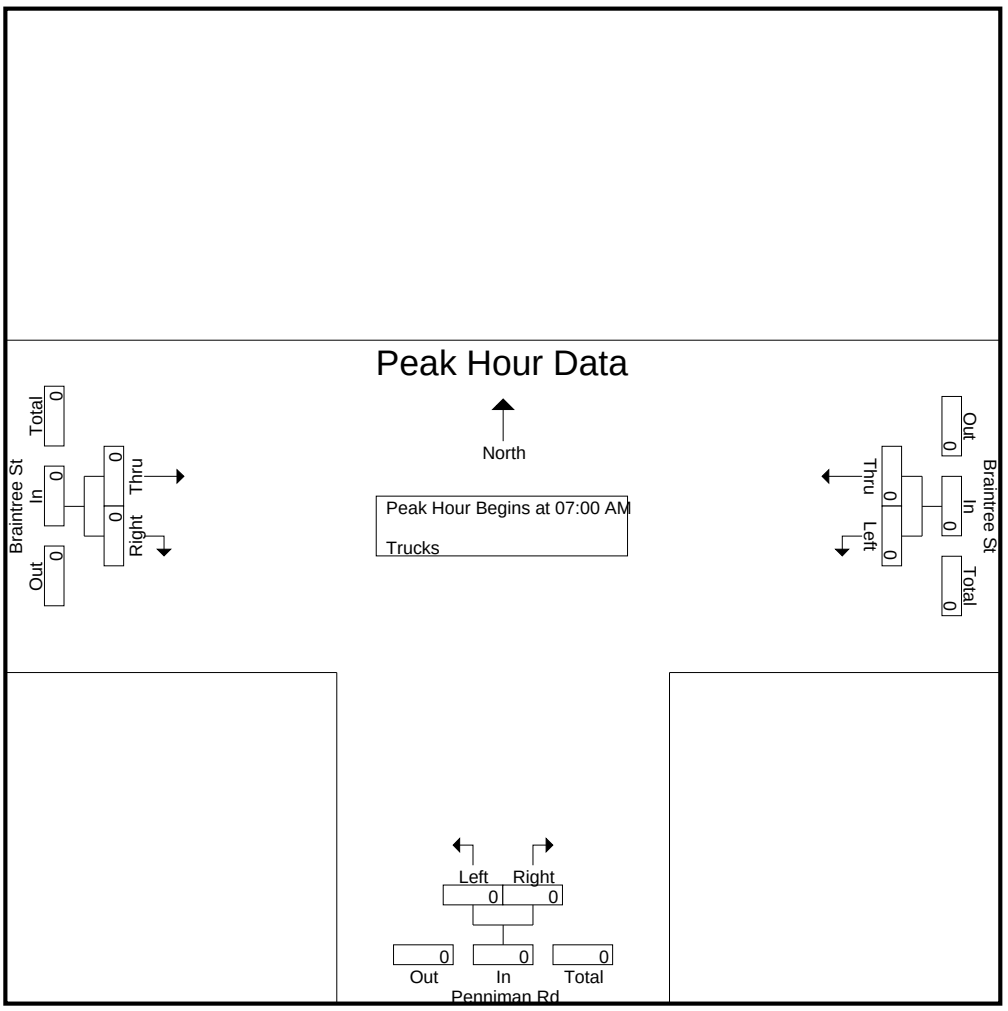
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 8

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

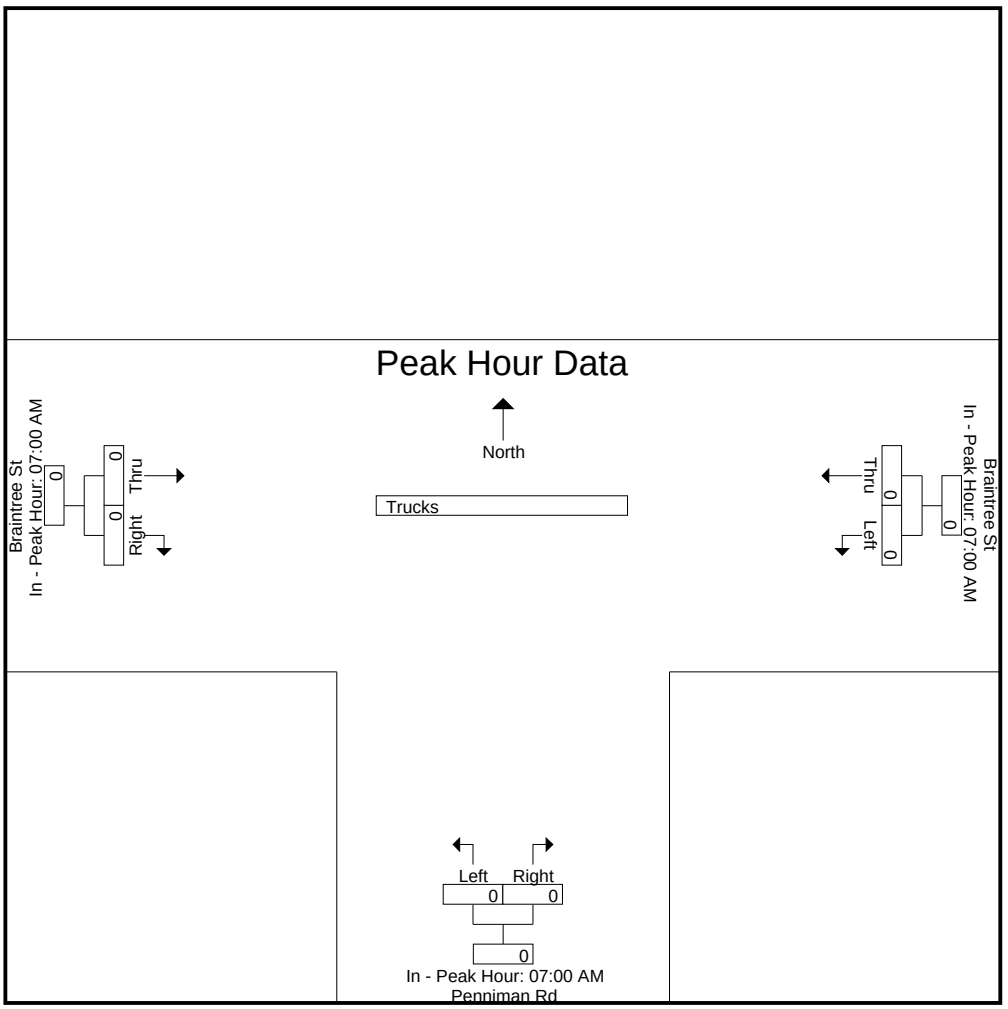
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 9

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 10

Groups Printed- Bikes Peds

	Braintree St From East			Penniman Rd From South			Braintree St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	2	0	0	5	1	0	2	9	1	10
07:15 AM	0	0	0	0	0	8	0	0	2	10	0	10
07:30 AM	0	0	0	0	0	5	0	0	2	7	0	7
07:45 AM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	2	0	0	19	1	0	6	27	1	28
08:00 AM	0	2	0	0	0	4	1	0	0	4	3	7
08:15 AM	0	1	0	0	1	7	1	0	0	7	3	10
08:30 AM	0	0	1	0	1	4	0	0	0	5	1	6
08:45 AM	0	0	2	1	0	6	0	0	0	8	1	9
Total	0	3	3	1	2	21	2	0	0	24	8	32
Grand Total	0	3	5	1	2	40	3	0	6	51	9	60
Apprch %	0	100		33.3	66.7		100	0				
Total %	0	33.3		11.1	22.2		33.3	0		85	15	

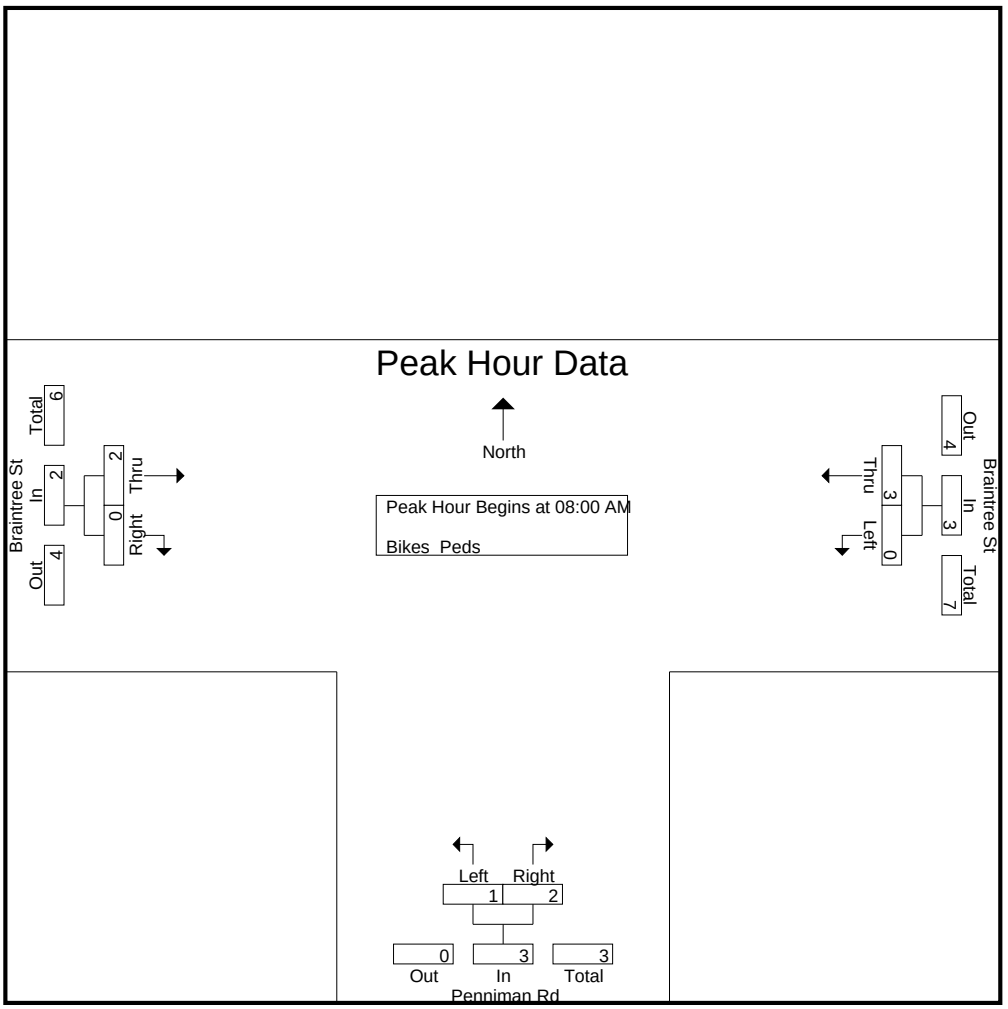
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 11

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	**2**	**2**	0	0	0	**1**	0	**1**	**3**
08:15 AM	0	1	1	0	**1**	**1**	1	0	1	3
08:30 AM	0	0	0	0	1	1	0	0	0	1
08:45 AM	0	0	0	**1**	0	1	0	0	0	1
Total Volume	0	3	3	1	2	3	2	0	2	8
% App. Total	0	100		33.3	66.7		100	0		
PHF	.000	.375	.375	.250	.500	.750	.500	.000	.500	.667



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

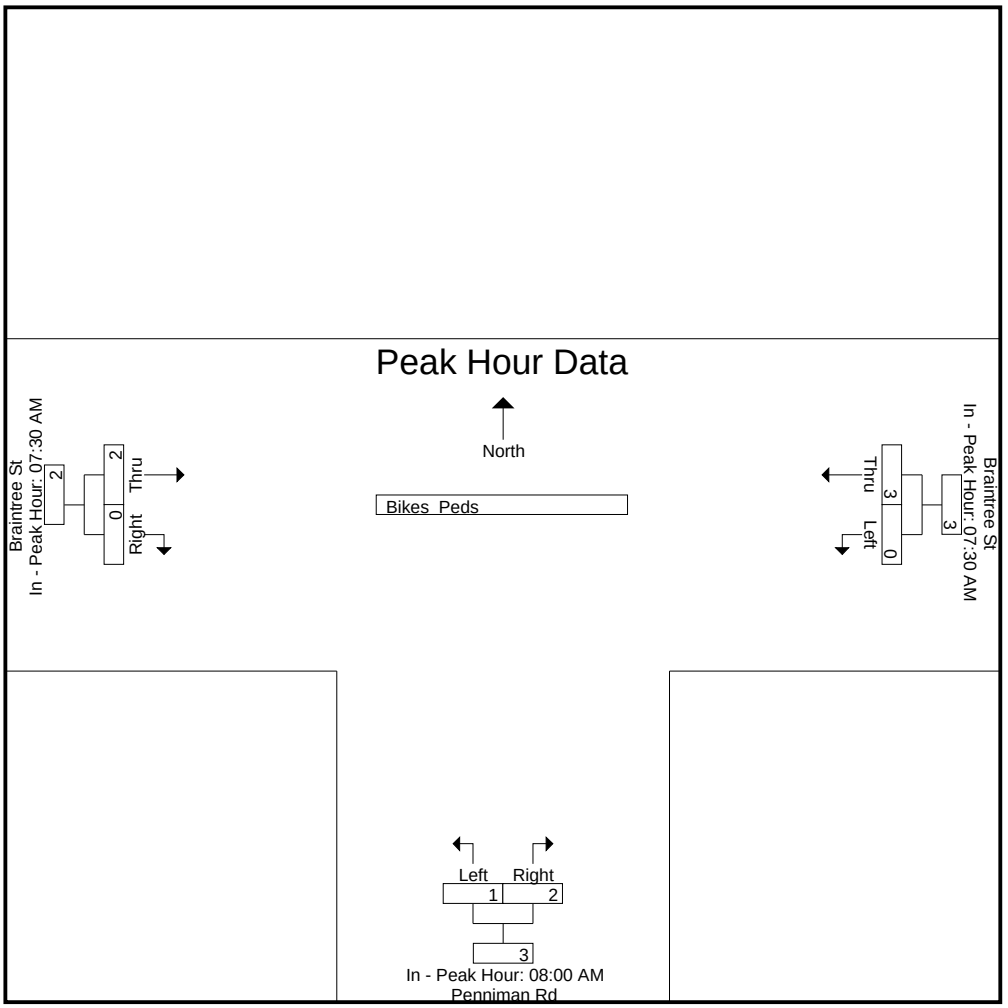
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 12

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			08:00 AM			07:30 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	**1**	**1**	0	0	0
+30 mins.	0	**2**	**2**	0	1	1	**1**	0	**1**
+45 mins.	0	1	1	**1**	0	1	1	0	1
Total Volume	0	3	3	1	2	3	2	0	2
% App. Total	0	100		33.3	66.7		100	0	
PHF	.000	.375	.375	.250	.500	.750	.500	.000	.500



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Braintree St From East		Penniman Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	4	20	4	3	33	7	71
04:15 PM	2	30	3	3	23	3	64
04:30 PM	0	21	2	5	21	2	51
04:45 PM	2	24	4	3	41	6	80
Total	8	95	13	14	118	18	266
05:00 PM	6	24	2	3	57	6	98
05:15 PM	5	14	2	4	39	7	71
05:30 PM	5	23	2	2	40	8	80
05:45 PM	3	21	1	1	37	9	72
Total	19	82	7	10	173	30	321
Grand Total	27	177	20	24	291	48	587
Apprch %	13.2	86.8	45.5	54.5	85.8	14.2	
Total %	4.6	30.2	3.4	4.1	49.6	8.2	
Cars	27	177	20	24	291	48	587
% Cars	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

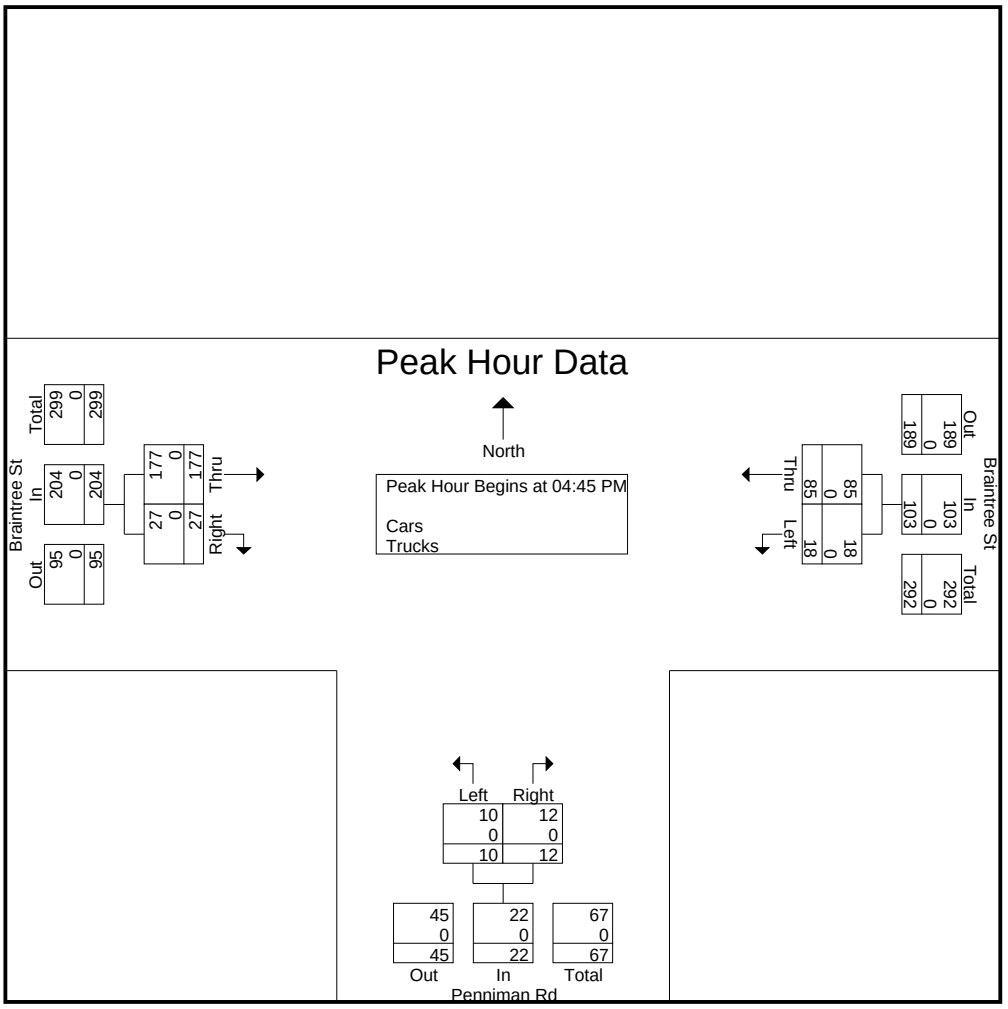
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 2

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	2	**24**	26	**4**	3	**7**	41	6	47	80
05:00 PM	**6**	24	**30**	2	3	5	**57**	6	**63**	**98**
05:15 PM	5	14	19	2	**4**	6	39	7	46	71
05:30 PM	5	23	28	2	2	4	40	**8**	48	80
Total Volume	18	85	103	10	12	22	177	27	204	329
% App. Total	17.5	82.5		45.5	54.5		86.8	13.2		
PHF	.750	.885	.858	.625	.750	.786	.776	.844	.810	.839
Cars	18	85	103	10	12	22	177	27	204	329
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

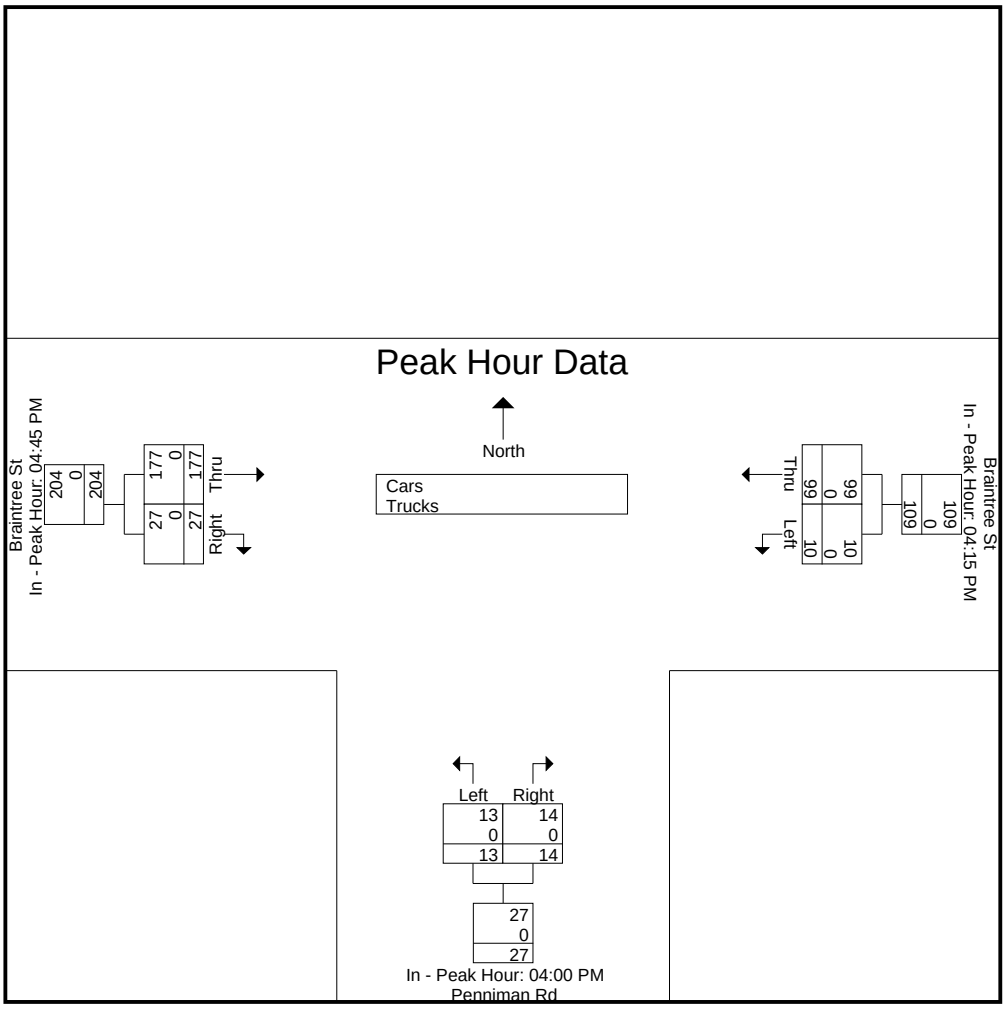
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 3

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM			04:00 PM			04:45 PM		
+0 mins.	2	**30**	**32**	**4**	3	**7**	41	6	47
+15 mins.	0	21	21	3	3	6	**57**	6	**63**
+30 mins.	2	24	26	2	**5**	7	39	7	46
+45 mins.	**6**	24	30	4	3	7	40	**8**	48
Total Volume	10	99	109	13	14	27	177	27	204
% App. Total	9.2	90.8		48.1	51.9		86.8	13.2	
PHF	.417	.825	.852	.813	.700	.964	.776	.844	.810
Cars	10	99	109	13	14	27	177	27	204
% Cars	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017

Groups Printed- Cars

	Braintree St From East		Penniman Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	4	20	4	3	33	7	71
04:15 PM	2	30	3	3	23	3	64
04:30 PM	0	21	2	5	21	2	51
04:45 PM	2	24	4	3	41	6	80
Total	8	95	13	14	118	18	266
05:00 PM	6	24	2	3	57	6	98
05:15 PM	5	14	2	4	39	7	71
05:30 PM	5	23	2	2	40	8	80
05:45 PM	3	21	1	1	37	9	72
Total	19	82	7	10	173	30	321
Grand Total	27	177	20	24	291	48	587
Apprch %	13.2	86.8	45.5	54.5	85.8	14.2	
Total %	4.6	30.2	3.4	4.1	49.6	8.2	

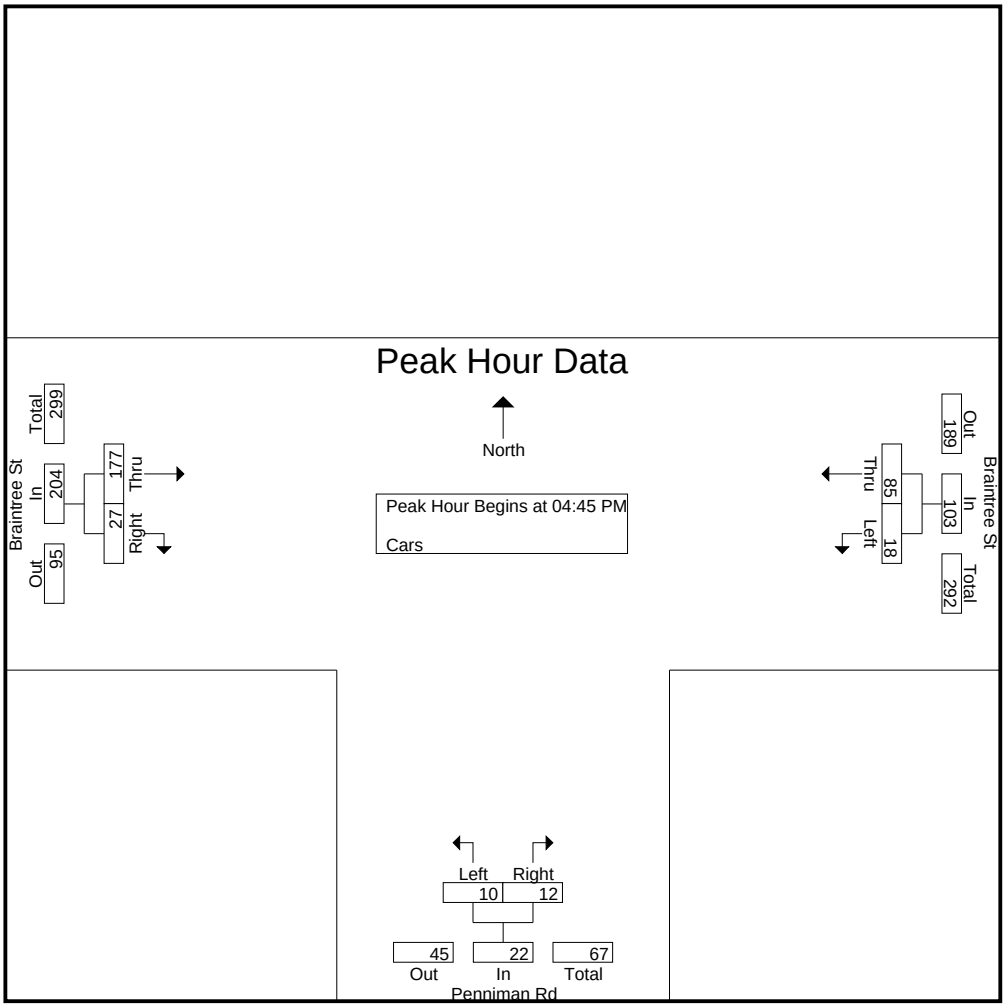
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 5

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	2	**24**	26	**4**	3	**7**	41	6	47	80
05:00 PM	**6**	24	**30**	2	3	5	**57**	6	**63**	**98**
05:15 PM	5	14	19	2	**4**	6	39	7	46	71
05:30 PM	5	23	28	2	2	4	40	**8**	48	80
Total Volume	18	85	103	10	12	22	177	27	204	329
% App. Total	17.5	82.5		45.5	54.5		86.8	13.2		
PHF	.750	.885	.858	.625	.750	.786	.776	.844	.810	.839



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

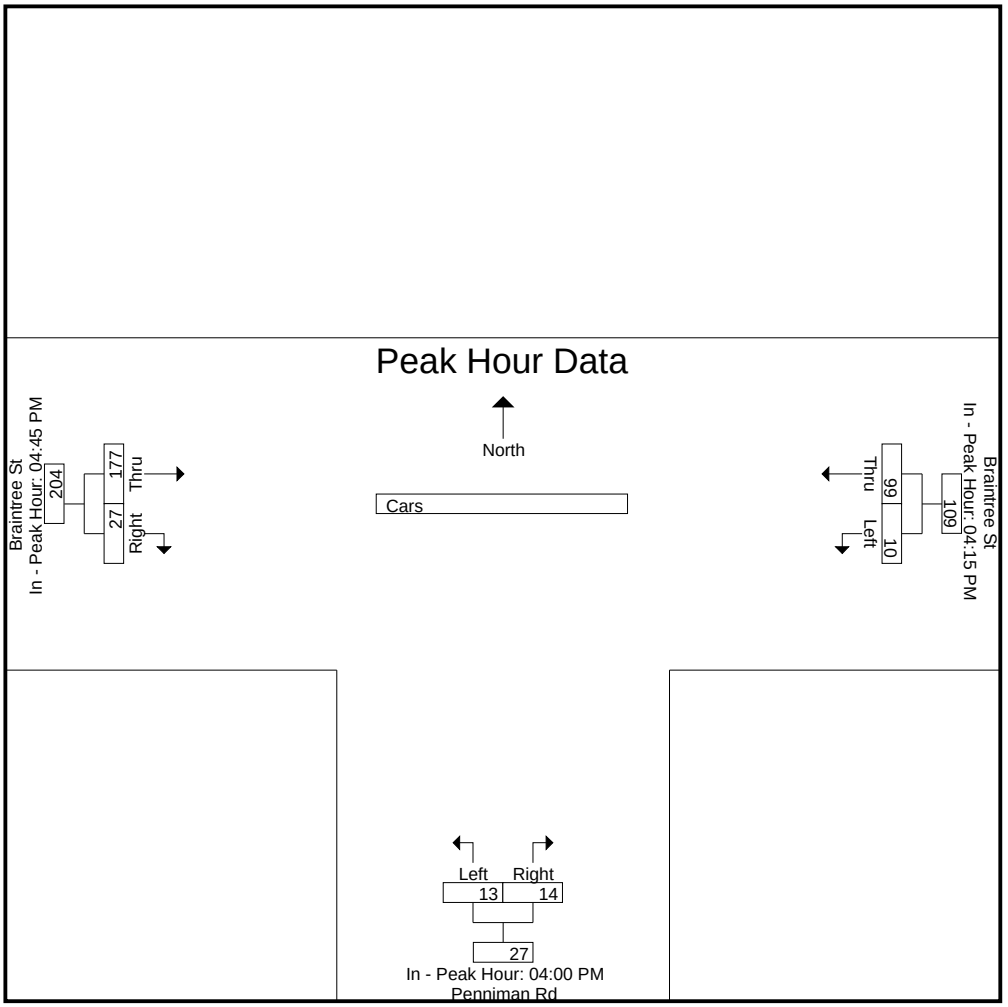
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 6

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM			04:00 PM			04:45 PM		
+0 mins.	2	**30**	**32**	**4**	3	**7**	41	6	47
+15 mins.	0	21	21	3	3	6	**57**	6	**63**
+30 mins.	2	24	26	2	**5**	7	39	7	46
+45 mins.	**6**	24	30	4	3	7	40	**8**	48
Total Volume	10	99	109	13	14	27	177	27	204
% App. Total	9.2	90.8		48.1	51.9		86.8	13.2	
PHF	.417	.825	.852	.813	.700	.964	.776	.844	.810



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017

Groups Printed- Trucks

	Braintree St From East		Penniman Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

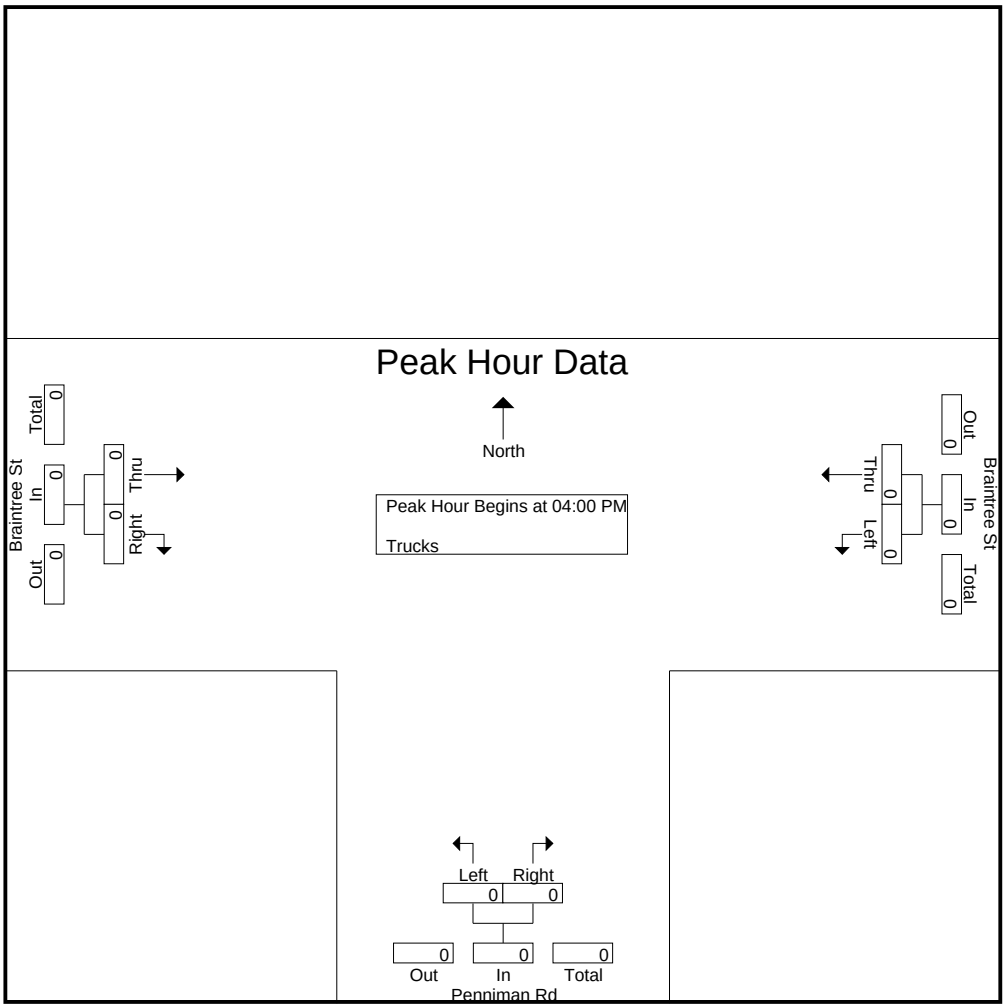
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 8

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

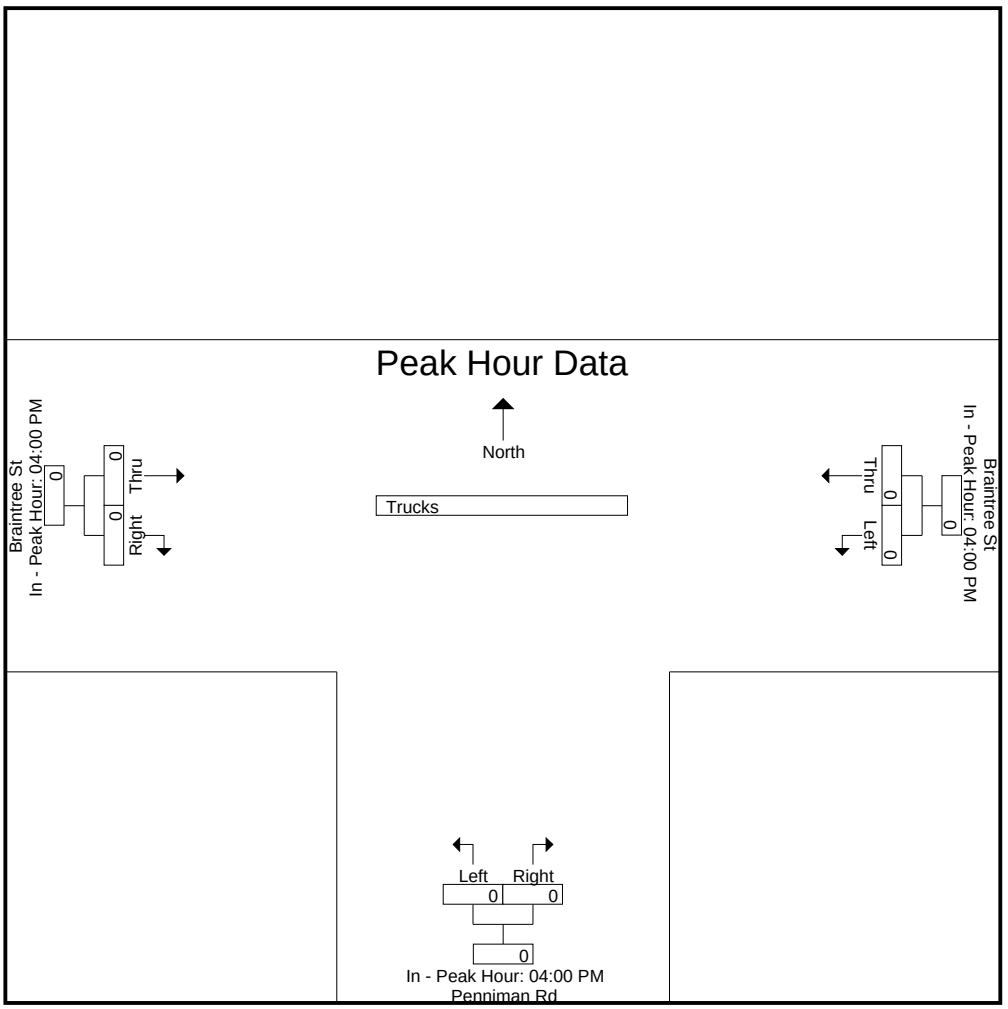
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 9

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 10

Groups Printed- Bikes Peds

	Braintree St From East			Penniman Rd From South			Braintree St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	1	0	0	0	6	0	0	0	6	2	8
04:15 PM	0	1	0	0	0	7	2	0	0	7	3	10
04:30 PM	0	2	2	0	0	6	1	0	0	8	3	11
04:45 PM	0	0	1	0	0	4	2	0	0	5	2	7
Total	1	4	3	0	0	23	5	0	0	26	10	36
05:00 PM	0	3	0	0	0	7	2	0	0	7	5	12
05:15 PM	0	1	0	0	0	4	0	0	0	4	1	5
05:30 PM	0	2	0	0	0	3	1	1	0	3	4	7
05:45 PM	0	1	0	0	0	8	0	0	0	8	1	9
Total	0	7	0	0	0	22	3	1	0	22	11	33
Grand Total	1	11	3	0	0	45	8	1	0	48	21	69
Apprch %	8.3	91.7		0	0		88.9	11.1				
Total %	4.8	52.4		0	0		38.1	4.8		69.6	30.4	

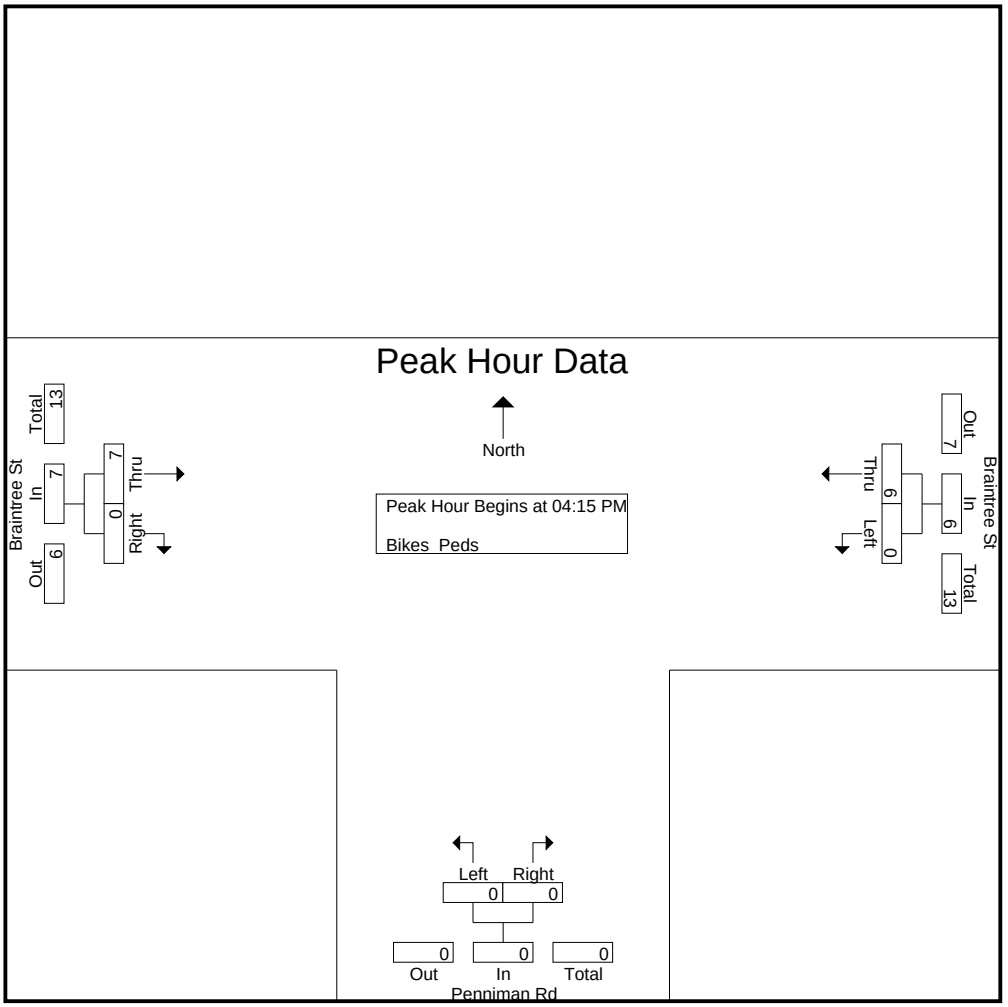
Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 11

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	1	1	0	0	0	**2**	0	**2**	3
04:30 PM	0	2	2	0	0	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	2	0	2	2
05:00 PM	0	**3**	**3**	0	0	0	2	0	2	**5**
Total Volume	0	6	6	0	0	0	7	0	7	13
% App. Total	0	100		0	0		100	0		
PHF	.000	.500	.500	.000	.000	.000	.875	.000	.875	.650



Accurate Counts

978-664-2565

N/S Street : Penniman Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

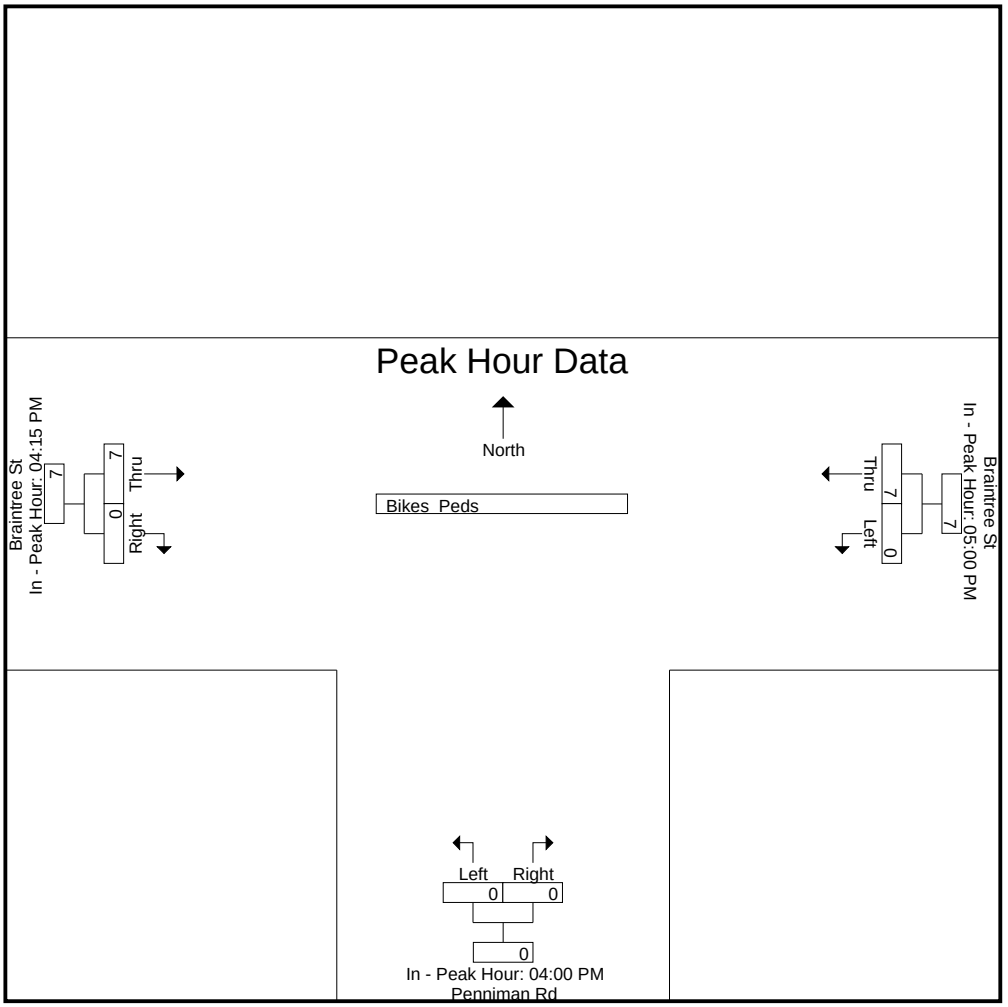
File Name : 17620003
Site Code : 17620003
Start Date : 4/13/2017
Page No : 12

	Braintree St From East			Penniman Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			04:15 PM		
+0 mins.	0	**3**	**3**	0	0	0	**2**	0	**2**
+15 mins.	0	1	1	0	0	0	1	0	1
+30 mins.	0	2	2	0	0	0	2	0	2
+45 mins.	0	1	1	0	0	0	2	0	2
Total Volume	0	7	7	0	0	0	7	0	7
% App. Total	0	100		0	0		100	0	
PHF	.000	.583	.583	.000	.000	.000	.875	.000	.875



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Braintree St From East		Rugg Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	6	17	5	2	13	4	47
07:15 AM	3	16	1	4	15	3	42
07:30 AM	2	25	0	3	25	4	59
07:45 AM	1	15	1	3	23	4	47
Total	12	73	7	12	76	15	195
08:00 AM	0	23	2	2	21	3	51
08:15 AM	0	21	2	1	22	6	52
08:30 AM	1	22	5	8	26	6	68
08:45 AM	2	37	0	2	23	3	67
Total	3	103	9	13	92	18	238
Grand Total	15	176	16	25	168	33	433
Apprch %	7.9	92.1	39	61	83.6	16.4	
Total %	3.5	40.6	3.7	5.8	38.8	7.6	
Cars	15	176	16	25	168	33	433
% Cars	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

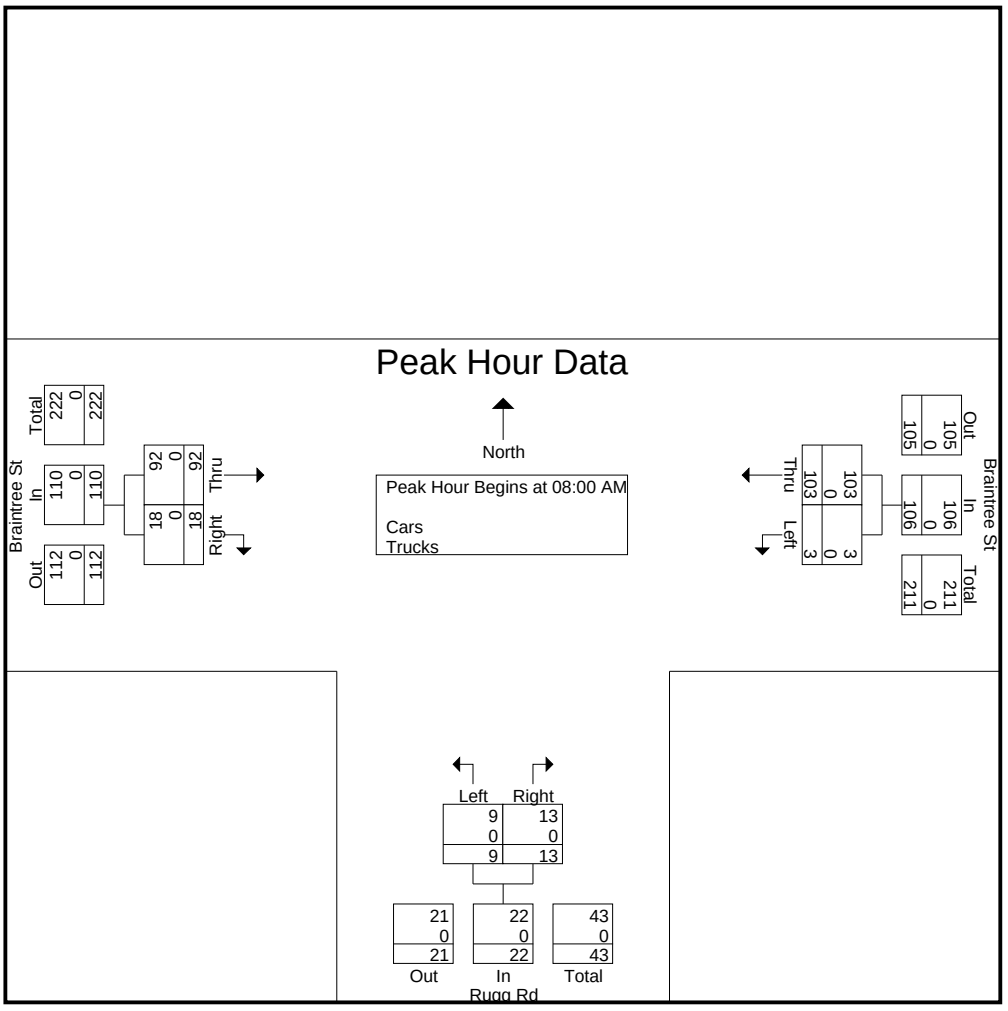
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 2

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	23	23	2	2	4	21	3	24	51
08:15 AM	0	21	21	2	1	3	22	**6**	28	52
08:30 AM	1	22	23	**5**	**8**	**13**	**26**	6	**32**	**68**
08:45 AM	**2**	**37**	**39**	0	2	2	23	3	26	67
Total Volume	3	103	106	9	13	22	92	18	110	238
% App. Total	2.8	97.2		40.9	59.1		83.6	16.4		
PHF	.375	.696	.679	.450	.406	.423	.885	.750	.859	.875
Cars	3	103	106	9	13	22	92	18	110	238
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

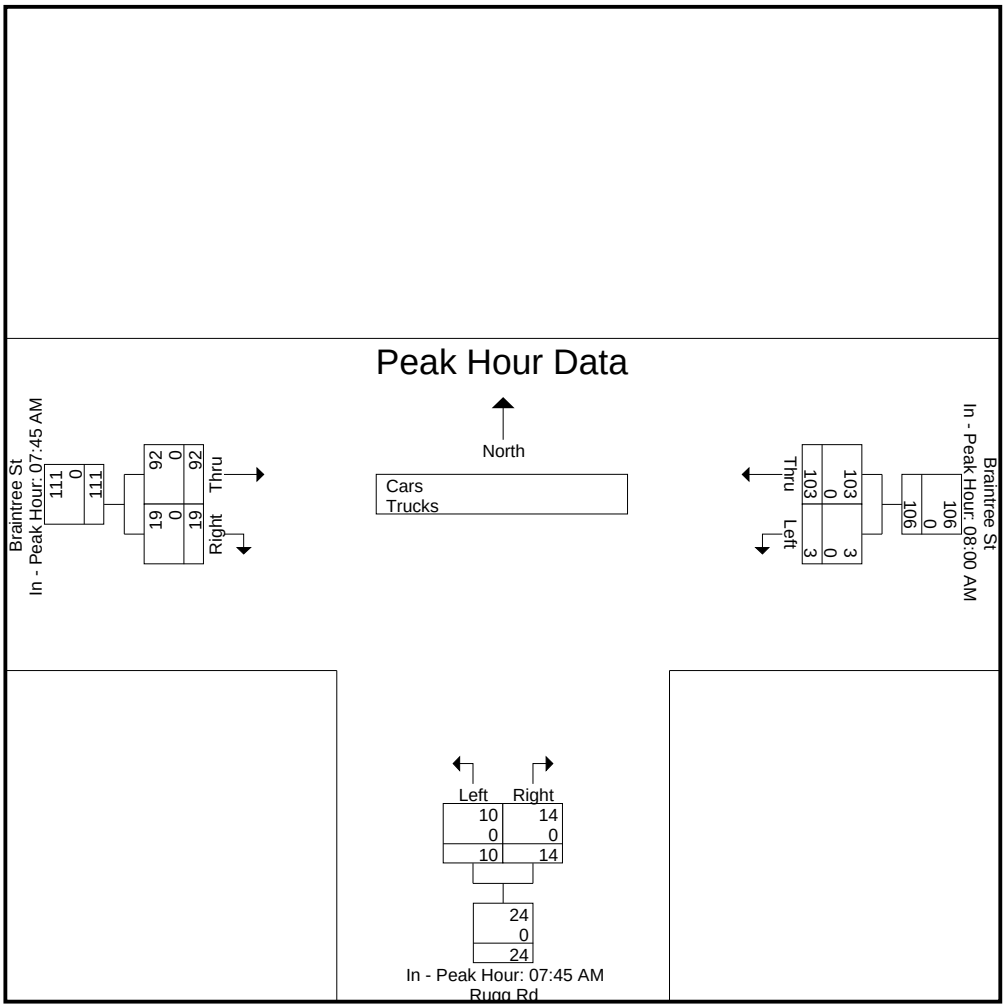
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 3

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			07:45 AM		
+0 mins.	0	23	23	1	3	4	23	4	27
+15 mins.	0	21	21	2	2	4	21	3	24
+30 mins.	1	22	23	2	1	3	22	**6**	28
+45 mins.	**2**	**37**	**39**	**5**	**8**	**13**	**26**	6	**32**
Total Volume	3	103	106	10	14	24	92	19	111
% App. Total	2.8	97.2		41.7	58.3		82.9	17.1	
PHF	.375	.696	.679	.500	.438	.462	.885	.792	.867
Cars	3	103	106	10	14	24	92	19	111
% Cars	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017

Groups Printed- Cars

	Braintree St From East		Rugg Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	6	17	5	2	13	4	47
07:15 AM	3	16	1	4	15	3	42
07:30 AM	2	25	0	3	25	4	59
07:45 AM	1	15	1	3	23	4	47
Total	12	73	7	12	76	15	195
08:00 AM	0	23	2	2	21	3	51
08:15 AM	0	21	2	1	22	6	52
08:30 AM	1	22	5	8	26	6	68
08:45 AM	2	37	0	2	23	3	67
Total	3	103	9	13	92	18	238
Grand Total	15	176	16	25	168	33	433
Apprch %	7.9	92.1	39	61	83.6	16.4	
Total %	3.5	40.6	3.7	5.8	38.8	7.6	

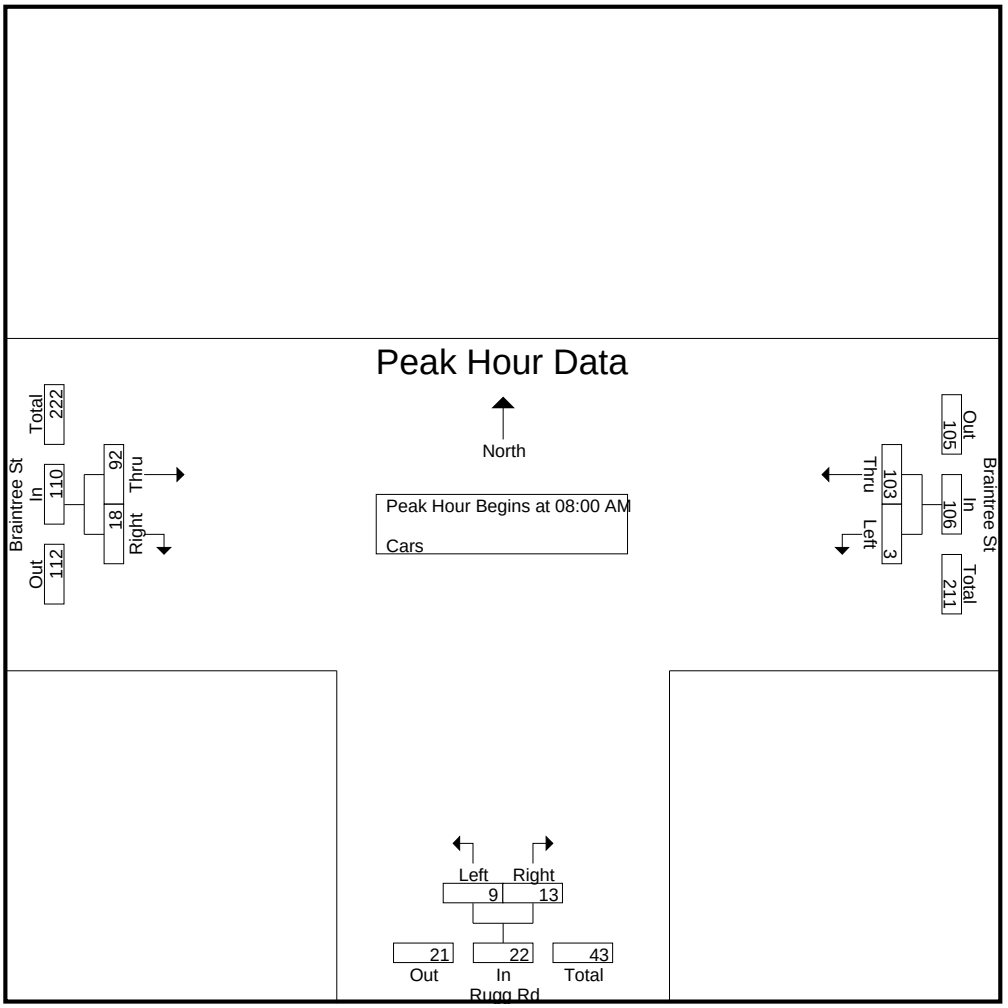
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 5

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	23	23	2	2	4	21	3	24	51
08:15 AM	0	21	21	2	1	3	22	**6**	28	52
08:30 AM	1	22	23	**5**	**8**	**13**	**26**	6	**32**	**68**
08:45 AM	**2**	**37**	**39**	0	2	2	23	3	26	67
Total Volume	3	103	106	9	13	22	92	18	110	238
% App. Total	2.8	97.2		40.9	59.1		83.6	16.4		
PHF	.375	.696	.679	.450	.406	.423	.885	.750	.859	.875



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

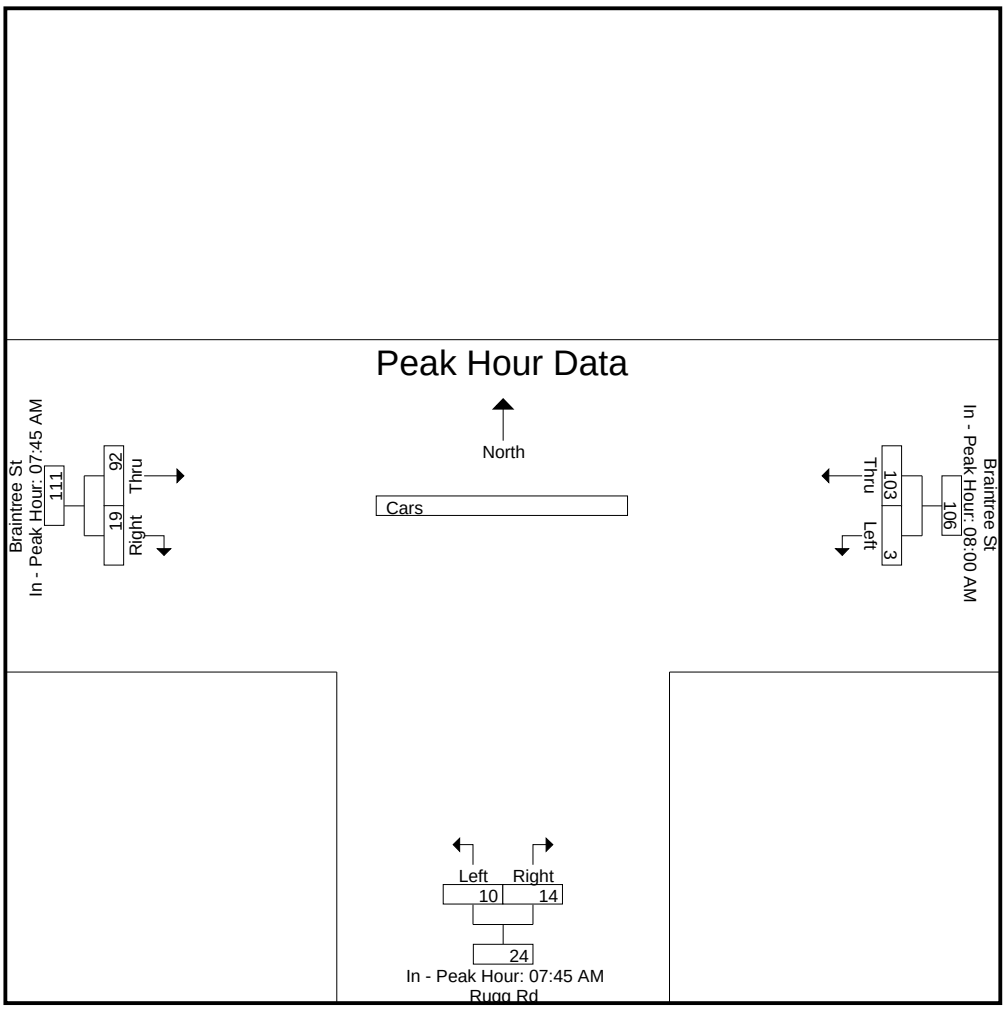
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 6

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			07:45 AM		
+0 mins.	0	23	23	1	3	4	23	4	27
+15 mins.	0	21	21	2	2	4	21	3	24
+30 mins.	1	22	23	2	1	3	22	**6**	28
+45 mins.	**2**	**37**	**39**	**5**	**8**	**13**	**26**	6	**32**
Total Volume	3	103	106	10	14	24	92	19	111
% App. Total	2.8	97.2		41.7	58.3		82.9	17.1	
PHF	.375	.696	.679	.500	.438	.462	.885	.792	.867



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017

Groups Printed- Trucks

	Braintree St From East		Rugg Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

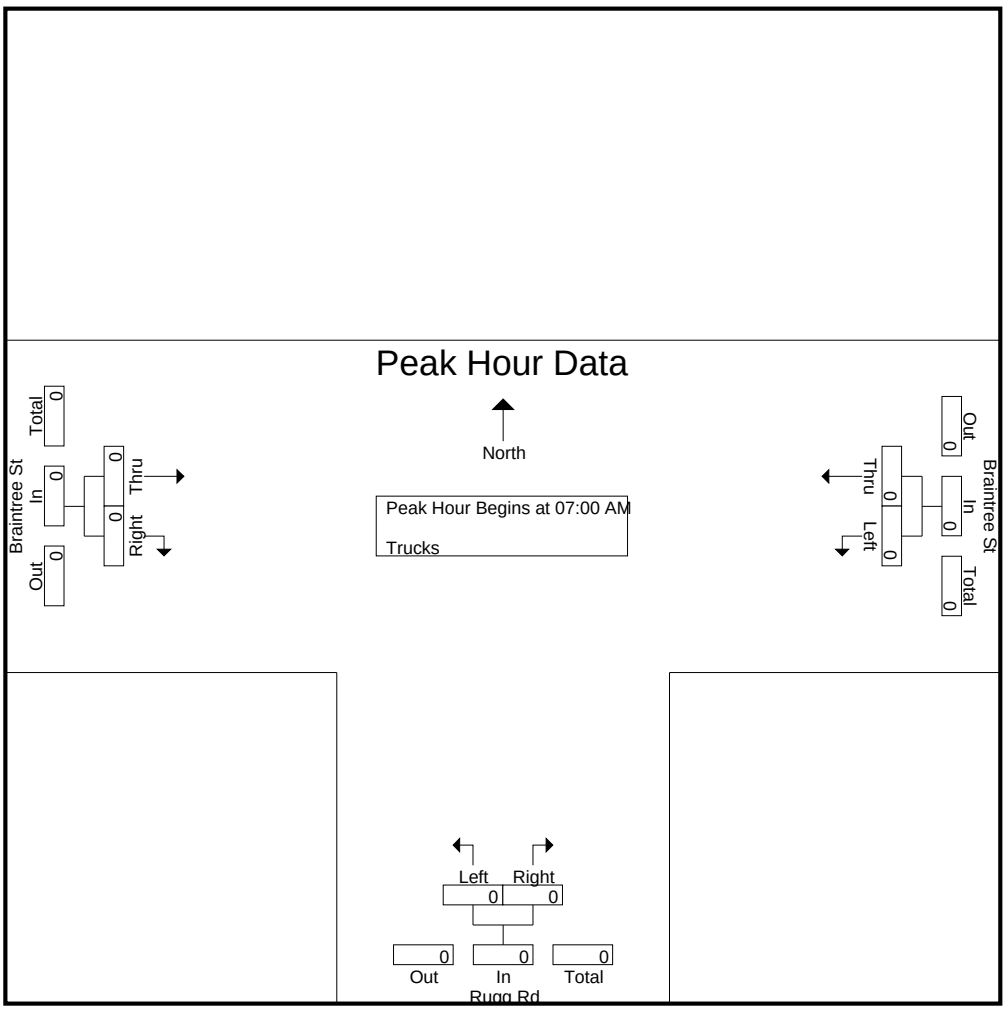
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 8

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

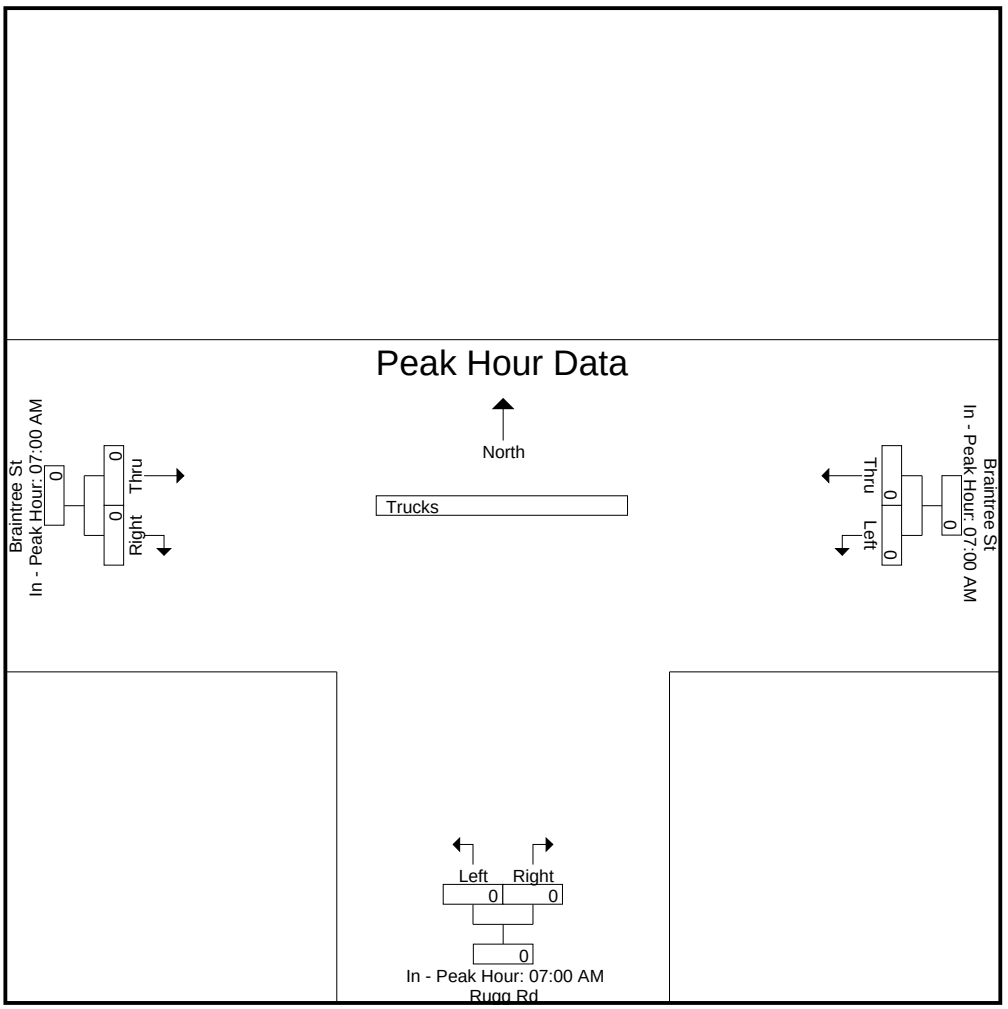
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 9

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 10

Groups Printed- Bikes Peds

	Braintree St From East			Rugg Rd From South			Braintree St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	2	0	1	3	1	0	14	19	2	21
07:15 AM	0	0	3	0	0	4	0	0	5	12	0	12
07:30 AM	0	0	1	0	0	4	0	0	0	5	0	5
07:45 AM	0	0	0	0	0	2	0	0	5	7	0	7
Total	0	0	6	0	1	13	1	0	24	43	2	45
08:00 AM	0	2	0	0	0	2	0	0	6	8	2	10
08:15 AM	1	1	0	0	0	5	1	0	2	7	3	10
08:30 AM	0	0	0	0	1	4	1	0	1	5	2	7
08:45 AM	1	0	0	0	0	0	0	0	2	2	1	3
Total	2	3	0	0	1	11	2	0	11	22	8	30
Grand Total	2	3	6	0	2	24	3	0	35	65	10	75
Apprch %	40	60		0	100		100	0				
Total %	20	30		0	20		30	0		86.7	13.3	

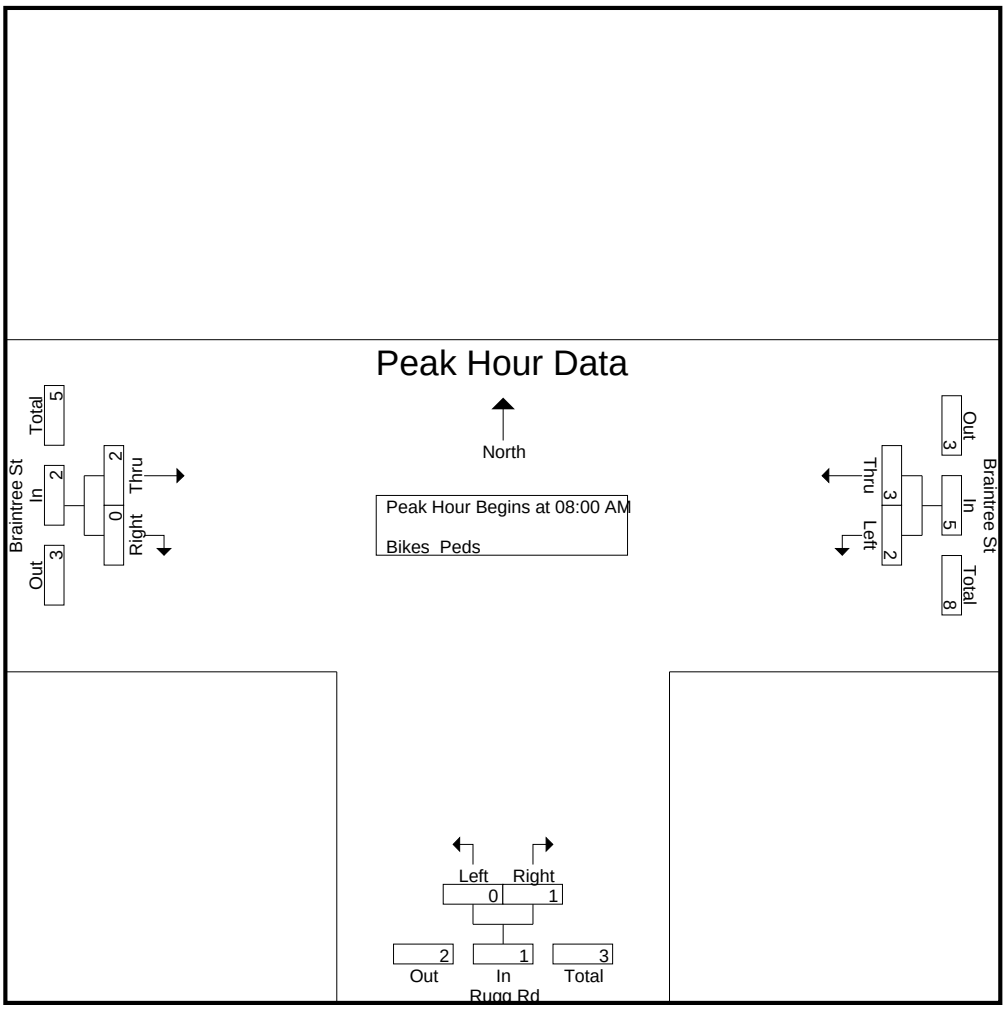
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 11

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	**2**	**2**	0	0	0	0	0	0	2
08:15 AM	**1**	1	2	0	0	0	**1**	0	**1**	**3**
08:30 AM	0	0	0	0	**1**	**1**	1	0	1	2
08:45 AM	1	0	1	0	0	0	0	0	0	1
Total Volume	2	3	5	0	1	1	2	0	2	8
% App. Total	40	60		0	100		100	0		
PHF	.500	.375	.625	.000	.250	.250	.500	.000	.500	.667



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

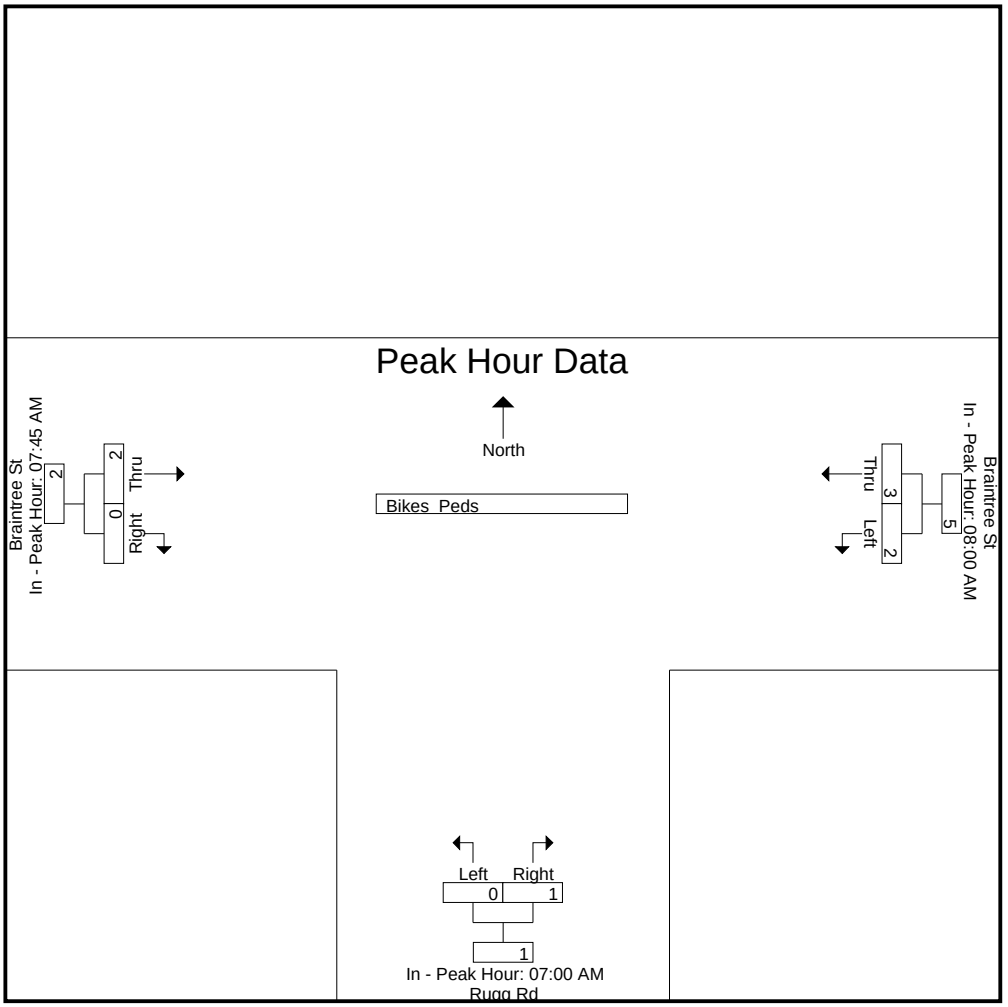
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 12

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			07:00 AM			07:45 AM		
+0 mins.	0	**2**	**2**	0	**1**	**1**	0	0	0
+15 mins.	**1**	1	2	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	0	**1**
+45 mins.	1	0	1	0	0	0	1	0	1
Total Volume	2	3	5	0	1	1	2	0	2
% App. Total	40	60		0	100		100	0	
PHF	.500	.375	.625	.000	.250	.250	.500	.000	.500



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	Braintree St From East		Rugg Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	14	3	8	32	3	62
04:15 PM	4	29	6	2	28	0	69
04:30 PM	1	17	4	12	23	5	62
04:45 PM	3	23	3	6	38	5	78
Total	10	83	16	28	121	13	271
05:00 PM	3	23	5	7	64	3	105
05:15 PM	3	18	1	6	44	2	74
05:30 PM	3	27	4	2	36	4	76
05:45 PM	1	20	6	4	39	1	71
Total	10	88	16	19	183	10	326
Grand Total	20	171	32	47	304	23	597
Apprch %	10.5	89.5	40.5	59.5	93	7	
Total %	3.4	28.6	5.4	7.9	50.9	3.9	
Cars	20	171	32	47	304	23	597
% Cars	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0

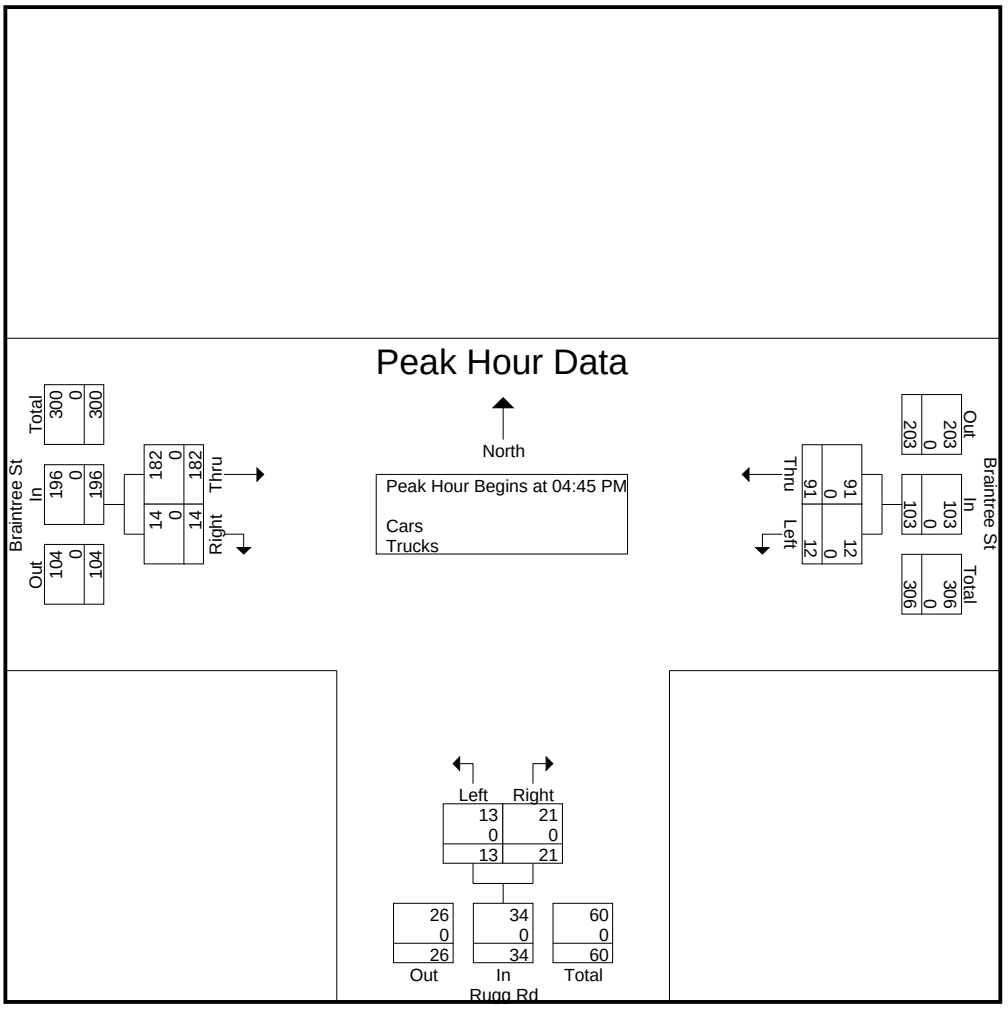
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 2

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**3**	23	26	3	6	9	38	**5**	43	78
05:00 PM	3	23	26	**5**	**7**	**12**	**64**	3	**67**	**105**
05:15 PM	3	18	21	1	6	7	44	2	46	74
05:30 PM	3	**27**	**30**	4	2	6	36	4	40	76
Total Volume	12	91	103	13	21	34	182	14	196	333
% App. Total	11.7	88.3		38.2	61.8		92.9	7.1		
PHF	1.00	.843	.858	.650	.750	.708	.711	.700	.731	.793
Cars	12	91	103	13	21	34	182	14	196	333
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

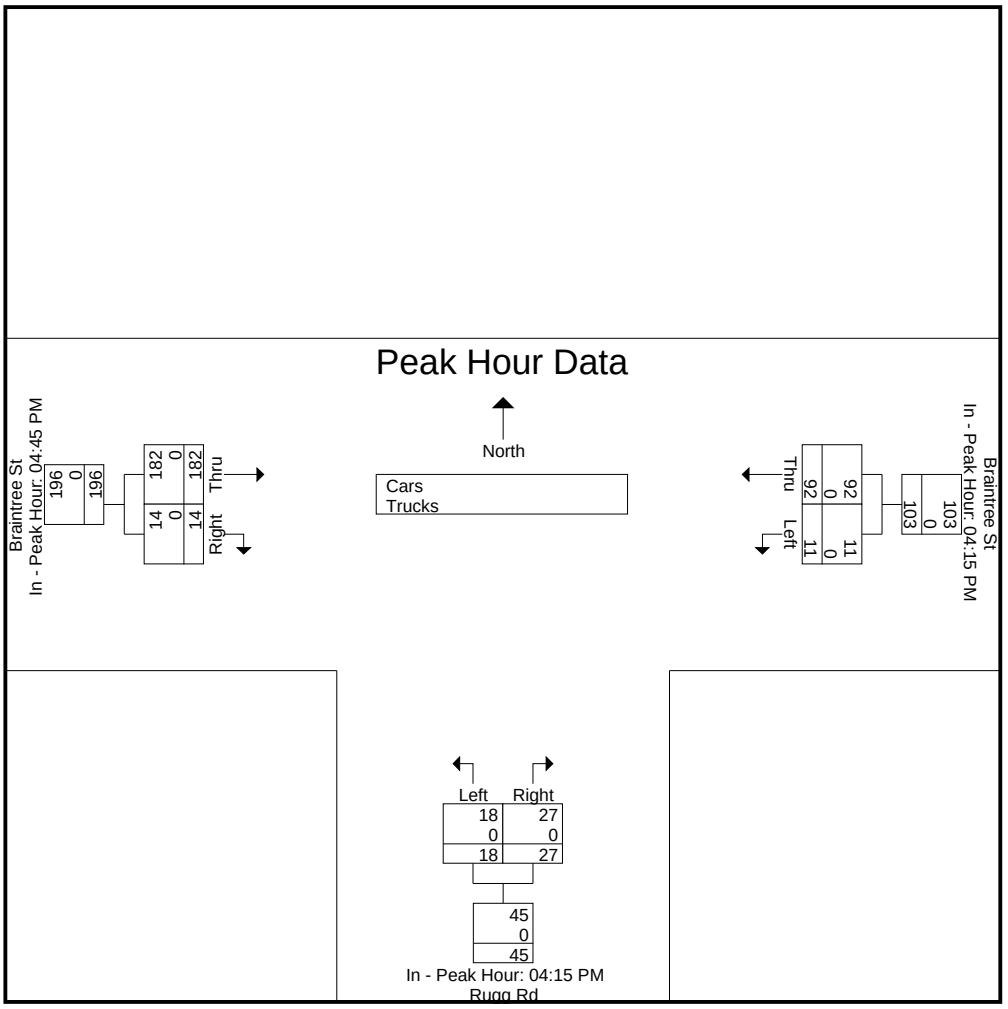
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 3

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:45 PM		
+0 mins.	**4**	**29**	**33**	**6**	2	8	38	**5**	43
+15 mins.	1	17	18	4	**12**	**16**	**64**	3	**67**
+30 mins.	3	23	26	3	6	9	44	2	46
+45 mins.	3	23	26	5	7	12	36	4	40
Total Volume	11	92	103	18	27	45	182	14	196
% App. Total	10.7	89.3		40	60		92.9	7.1	
PHF	.688	.793	.780	.750	.563	.703	.711	.700	.731
Cars	11	92	103	18	27	45	182	14	196
% Cars	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017

Groups Printed- Cars

	Braintree St From East		Rugg Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	14	3	8	32	3	62
04:15 PM	4	29	6	2	28	0	69
04:30 PM	1	17	4	12	23	5	62
04:45 PM	3	23	3	6	38	5	78
Total	10	83	16	28	121	13	271
05:00 PM	3	23	5	7	64	3	105
05:15 PM	3	18	1	6	44	2	74
05:30 PM	3	27	4	2	36	4	76
05:45 PM	1	20	6	4	39	1	71
Total	10	88	16	19	183	10	326
Grand Total	20	171	32	47	304	23	597
Apprch %	10.5	89.5	40.5	59.5	93	7	
Total %	3.4	28.6	5.4	7.9	50.9	3.9	

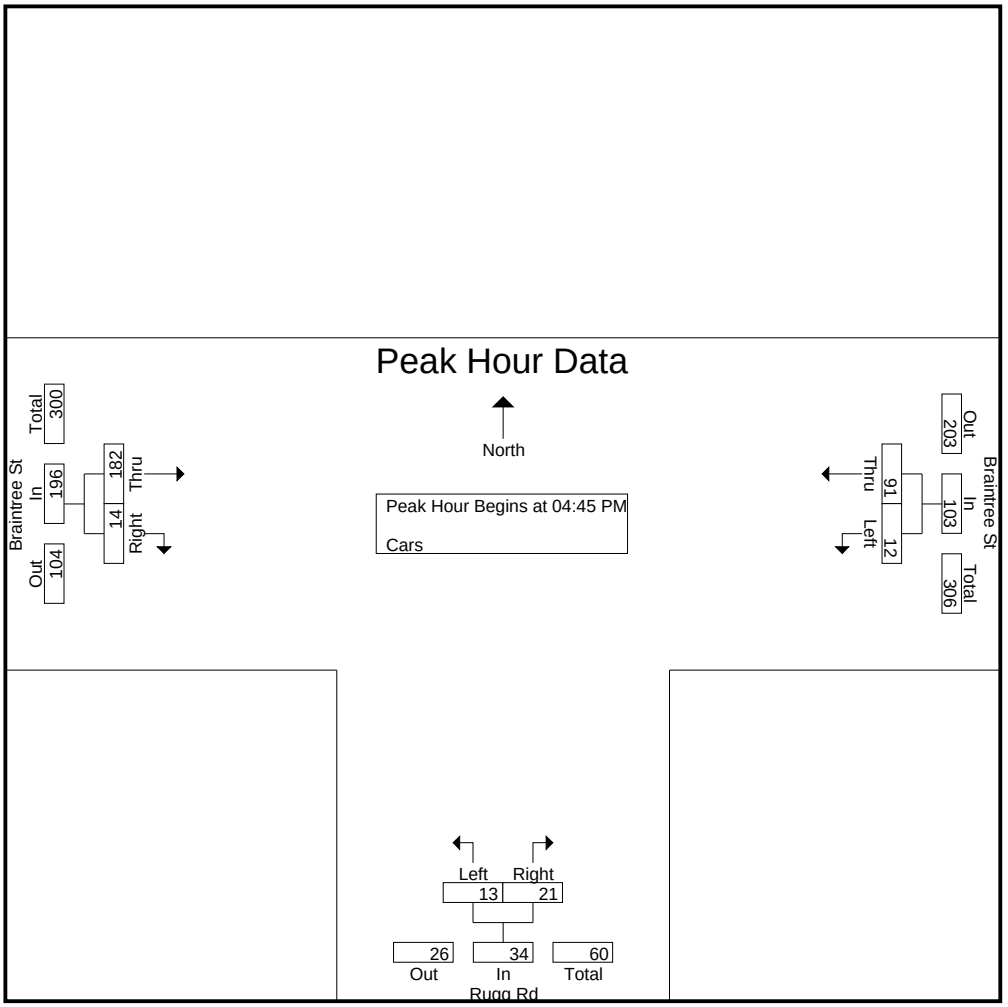
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 5

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**3**	23	26	3	6	9	38	**5**	43	78
05:00 PM	3	23	26	**5**	**7**	**12**	**64**	3	**67**	**105**
05:15 PM	3	18	21	1	6	7	44	2	46	74
05:30 PM	3	**27**	**30**	4	2	6	36	4	40	76
Total Volume	12	91	103	13	21	34	182	14	196	333
% App. Total	11.7	88.3		38.2	61.8		92.9	7.1		
PHF	1.00	.843	.858	.650	.750	.708	.711	.700	.731	.793



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

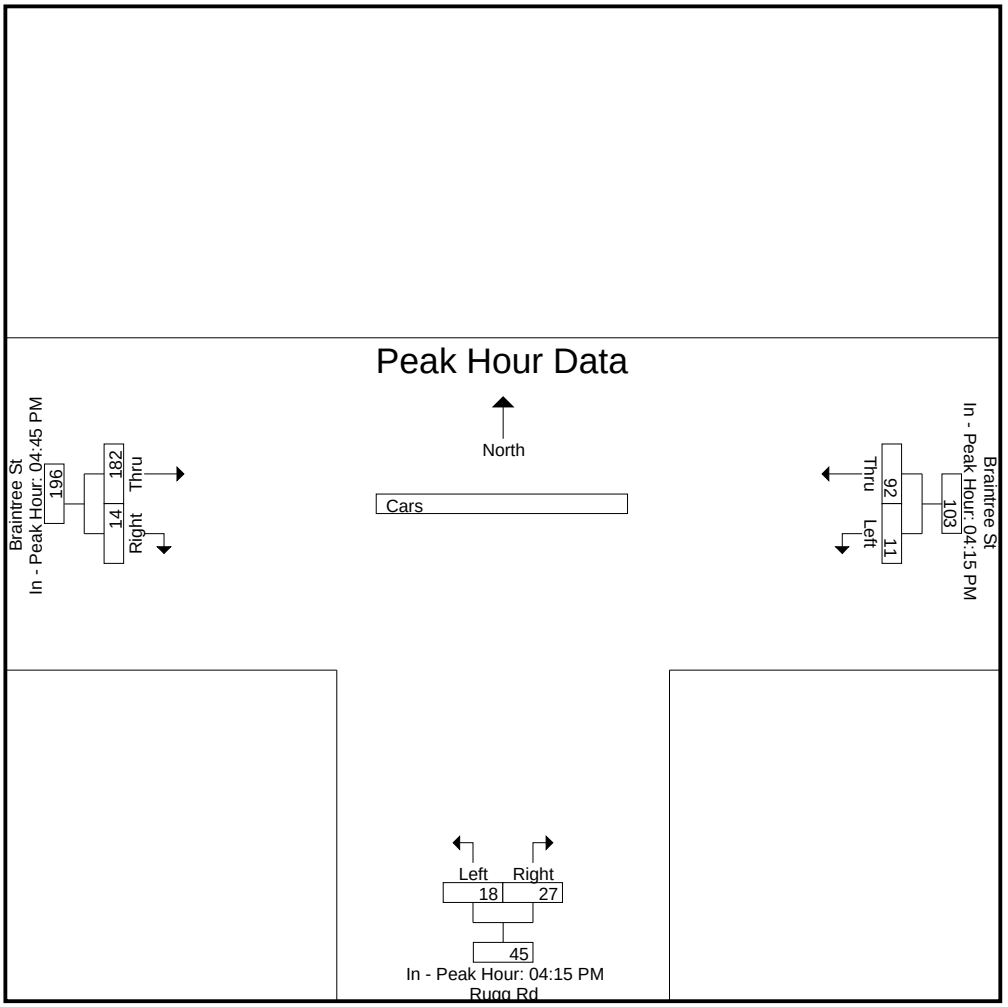
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 6

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:45 PM		
+0 mins.	**4**	**29**	**33**	**6**	2	8	38	**5**	43
+15 mins.	1	17	18	4	**12**	**16**	**64**	3	**67**
+30 mins.	3	23	26	3	6	9	44	2	46
+45 mins.	3	23	26	5	7	12	36	4	40
Total Volume	11	92	103	18	27	45	182	14	196
% App. Total	10.7	89.3		40	60		92.9	7.1	
PHF	.688	.793	.780	.750	.563	.703	.711	.700	.731



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017

Groups Printed- Trucks

	Braintree St From East		Rugg Rd From South		Braintree St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

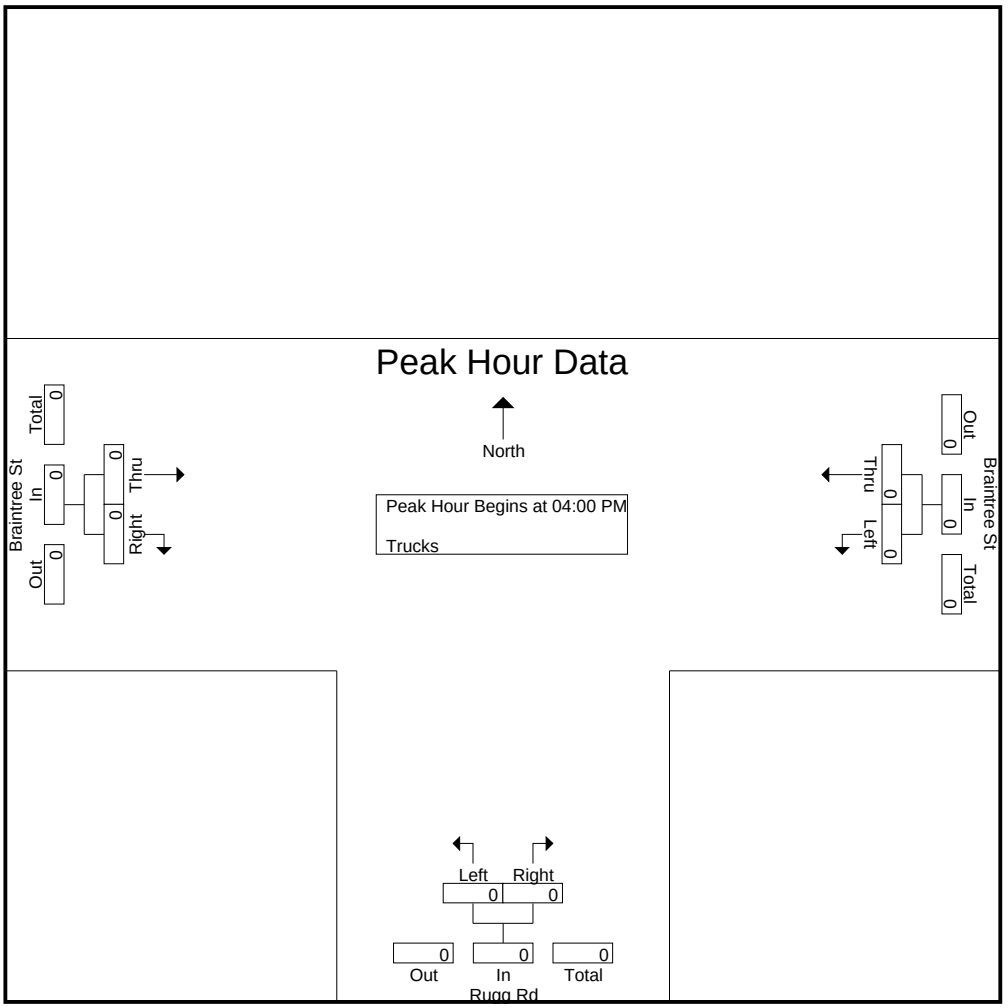
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 8

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

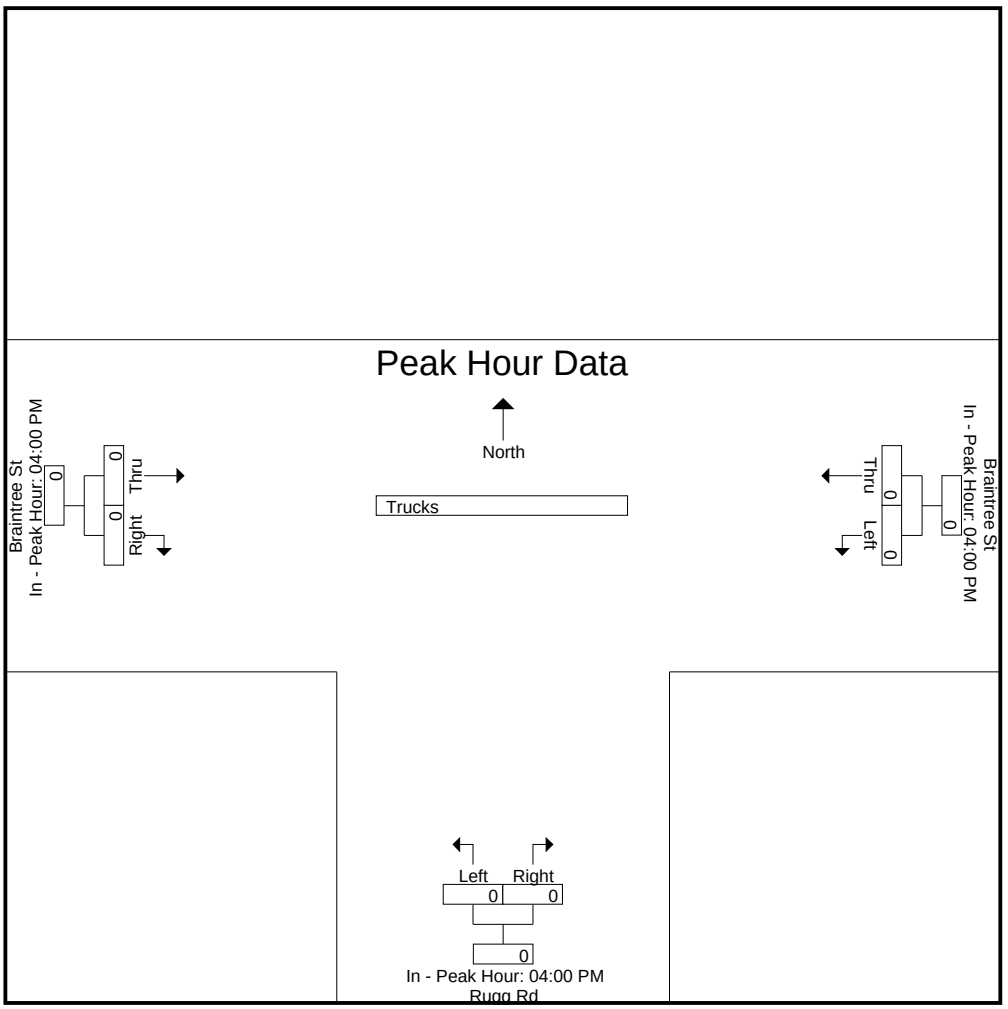
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 9

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 10

Groups Printed- Bikes Peds

	Braintree St From East			Rugg Rd From South			Braintree St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	2	3	0	0	3	0	0	0	6	2	8
04:15 PM	0	1	0	0	0	4	2	0	3	7	3	10
04:30 PM	0	0	3	0	0	5	0	0	0	8	0	8
04:45 PM	0	0	0	0	0	1	2	0	0	1	2	3
Total	0	3	6	0	0	13	4	0	3	22	7	29
05:00 PM	1	3	0	0	0	8	1	0	1	9	5	14
05:15 PM	0	1	0	0	0	1	0	0	2	3	1	4
05:30 PM	0	1	0	0	0	5	2	0	0	5	3	8
05:45 PM	0	3	0	0	0	8	1	0	4	12	4	16
Total	1	8	0	0	0	22	4	0	7	29	13	42
Grand Total	1	11	6	0	0	35	8	0	10	51	20	71
Apprch %	8.3	91.7		0	0		100	0				
Total %	5	55		0	0		40	0		71.8	28.2	

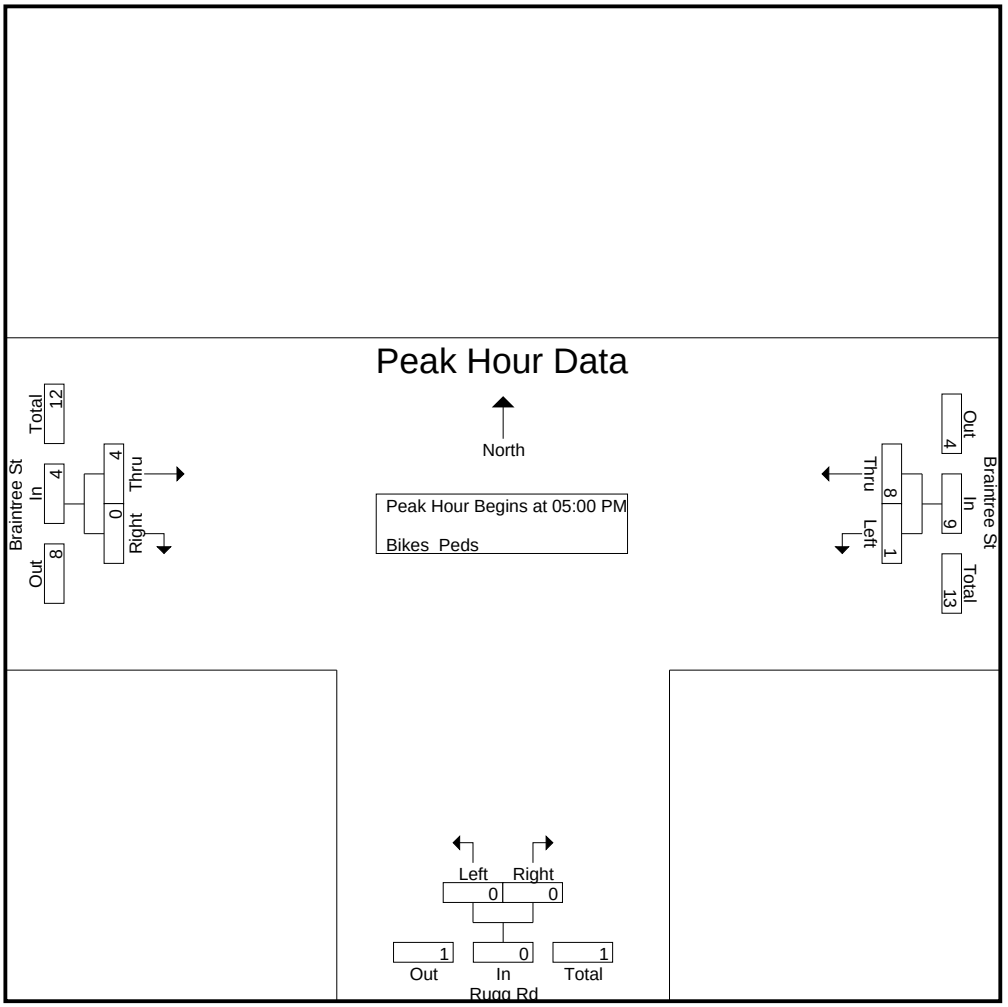
Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 11

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**1**	**3**	**4**	0	0	0	1	0	1	**5**
05:15 PM	0	1	1	0	0	0	0	0	0	1
05:30 PM	0	1	1	0	0	0	**2**	0	**2**	3
05:45 PM	0	3	3	0	0	0	1	0	1	4
Total Volume	1	8	9	0	0	0	4	0	4	13
% App. Total	11.1	88.9		0	0		100	0		
PHF	.250	.667	.563	.000	.000	.000	.500	.000	.500	.650



Accurate Counts

978-664-2565

N/S Street : Rugg Road
E/W Street: Braintree Street
City/State : Allston, MA
Weather : Clear

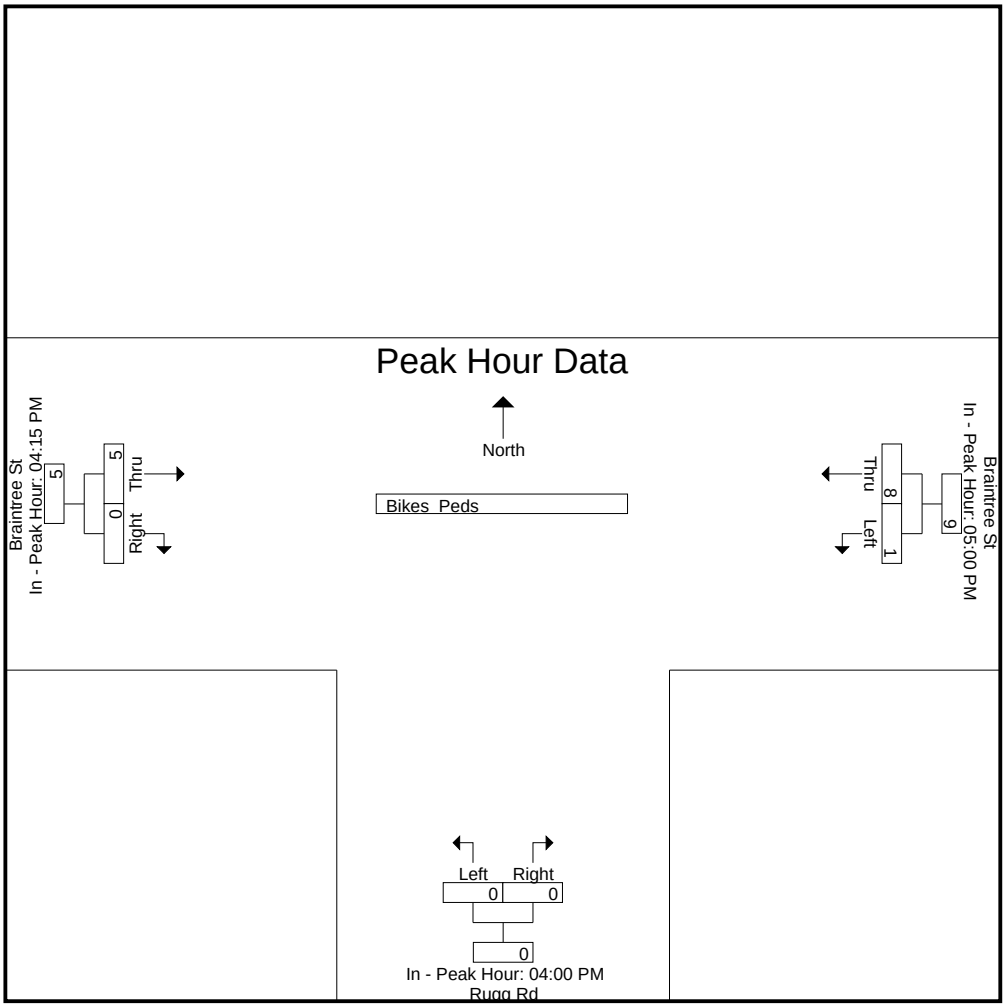
File Name : 17620004
Site Code : 17620004
Start Date : 4/13/2017
Page No : 12

	Braintree St From East			Rugg Rd From South			Braintree St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			04:15 PM		
+0 mins.	**1**	**3**	**4**	0	0	0	**2**	0	**2**
+15 mins.	0	1	1	0	0	0	0	0	0
+30 mins.	0	1	1	0	0	0	2	0	2
+45 mins.	0	3	3	0	0	0	1	0	1
Total Volume	1	8	9	0	0	0	5	0	5
% App. Total	11.1	88.9		0	0		100	0	
PHF	.250	.667	.563	.000	.000	.000	.625	.000	.625



Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	436	465	6	5	20
Future Vol, veh/h	31	436	465	6	5	20
Conflicting Peds, #/hr	12	0	0	12	38	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	65	87	93	75	42	56
Heavy Vehicles, %	0	4	5	0	0	0
Mvmt Flow	48	501	500	8	12	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	520	0	-	0	1151	523
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	635	-
Critical Hdwy	4.1	-	-	-	7.1	6.2
Critical Hdwy Stg 1	-	-	-	-	6.1	-
Critical Hdwy Stg 2	-	-	-	-	6.1	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1056	-	-	-	177	558
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	470	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1050	-	-	-	161	549
Mov Cap-2 Maneuver	-	-	-	-	161	-
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	426	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	17.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1050	-	-	-	343
HCM Lane V/C Ratio	0.045	-	-	-	0.139
HCM Control Delay (s)	8.6	0	-	-	17.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	469	541	32
v/c Ratio	0.42	0.49	0.14
Control Delay	5.9	6.8	36.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.9	6.8	36.2
Queue Length 50th (ft)	98	123	17
Queue Length 95th (ft)	153	193	44
Internal Link Dist (ft)	529	261	388
Turn Bay Length (ft)			
Base Capacity (vph)	1109	1103	287
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.42	0.49	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Volume (vph)	13	430	0	0	486	14	0	0	0	2	0	12
Future Volume (vph)	13	430	0	0	486	14	0	0	0	2	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	11	12	12	12	11	12	11
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			1.00						0.97	
Flpb, ped/bikes		1.00			1.00						0.99	
Frt		1.00			0.99						0.88	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1429			1393						1439	
Flt Permitted		0.98			1.00						0.99	
Satd. Flow (perm)		1402			1393						1439	
Peak-hour factor, PHF	0.81	0.95	0.92	0.92	0.94	0.58	0.92	0.92	0.92	0.50	0.92	0.43
Adj. Flow (vph)	16	453	0	0	517	24	0	0	0	4	0	28
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	469	0	0	541	0	0	0	0	0	32	0
Confl. Peds. (#/hr)	18					18				17		7
Heavy Vehicles (%)	0%	4%	2%	2%	6%	0%	2%	2%	2%	0%	2%	0%
Parking (#/hr)	0	0			0	0				0		0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		1			1						5	
Permitted Phases	1			1						5		
Actuated Green, G (s)		77.6			77.6						14.4	
Effective Green, g (s)		77.6			77.6						14.4	
Actuated g/C Ratio		0.78			0.78						0.14	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		0.2			0.2						2.0	
Lane Grp Cap (vph)		1087			1080						207	
v/s Ratio Prot					c0.39							
v/s Ratio Perm		0.33									0.02	
v/c Ratio		0.43			0.50						0.15	
Uniform Delay, d1		3.8			4.1						37.5	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.3			1.7						0.1	
Delay (s)		5.0			5.8						37.6	
Level of Service		A			A						D	
Approach Delay (s)		5.0			5.8			0.0			37.6	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	83	7	5	88	9	25
Future Vol, veh/h	83	7	5	88	9	25
Conflicting Peds, #/hr	0	16	16	0	8	8
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	38	56	79	69	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	104	18	9	111	13	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	138	0	266	137
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	137	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1458	-	727	917
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	895	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1448	-	707	898
Mov Cap-2 Maneuver	-	-	-	-	707	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	883	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	835	-	-	1448	-
HCM Lane V/C Ratio	0.056	-	-	0.006	-
HCM Control Delay (s)	9.6	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	92	19	2	81	10	14
Future Vol, veh/h	92	19	2	81	10	14
Conflicting Peds, #/hr	0	13	13	0	6	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	75	38	70	45	41
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	103	25	5	116	22	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	142	0	261	136
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	132	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1453	-	732	918
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	899	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1444	-	717	902
Mov Cap-2 Maneuver	-	-	-	-	717	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	891	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	819	-	-	1444	-
HCM Lane V/C Ratio	0.069	-	-	0.004	-
HCM Control Delay (s)	9.7	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	420	608	14	1	28
Future Vol, veh/h	38	420	608	14	1	28
Conflicting Peds, #/hr	49	0	0	49	52	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	91	93	58	25	88
Heavy Vehicles, %	0	4	2	0	0	0
Mvmt Flow	60	462	654	24	4	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	727	0	-	0	1349	722
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	634	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	886	-	-	-	168	430
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	532	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	881	-	-	-	140	409
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	462	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	881	-	-	-	337
HCM Lane V/C Ratio	0.068	-	-	-	0.106
HCM Control Delay (s)	9.4	0	-	-	16.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	528	663	36
v/c Ratio	0.42	0.50	0.32
Control Delay	2.7	3.3	55.3
Queue Delay	0.0	0.0	0.0
Total Delay	2.7	3.3	55.3
Queue Length 50th (ft)	60	85	25
Queue Length 95th (ft)	112	162	57
Internal Link Dist (ft)	543	426	385
Turn Bay Length (ft)			
Base Capacity (vph)	1252	1313	278
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.42	0.50	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Volume (vph)	10	481	0	0	614	12	0	0	0	6	0	19
Future Volume (vph)	10	481	0	0	614	12	0	0	0	6	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	11	11	12	12	12	11	12	11
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		1.00			0.99						0.97	
Flpb, ped/bikes		1.00			1.00						0.98	
Frt		1.00			1.00						0.91	
Flt Protected		1.00			1.00						0.98	
Satd. Flow (prot)		1426			1446						1454	
Flt Permitted		0.97			1.00						0.98	
Satd. Flow (perm)		1379			1446						1454	
Peak-hour factor, PHF	0.46	0.95	0.92	0.92	0.95	0.69	0.92	0.92	0.92	0.50	0.92	0.80
Adj. Flow (vph)	22	506	0	0	646	17	0	0	0	12	0	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	528	0	0	663	0	0	0	0	0	36	0
Confl. Peds. (#/hr)	47					47				24		4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	4%	2%	2%	2%	0%	2%	2%	2%	0%	2%	0%
Parking (#/hr)	0	0			0	0				0		0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		1			1						5	
Permitted Phases	1			1						5		
Actuated Green, G (s)		96.6			96.6						5.4	
Effective Green, g (s)		96.6			96.6						5.4	
Actuated g/C Ratio		0.88			0.88						0.05	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		0.2			0.2						2.0	
Lane Grp Cap (vph)		1211			1269						71	
v/s Ratio Prot					c0.46							
v/s Ratio Perm		0.38									0.02	
v/c Ratio		0.44			0.52						0.51	
Uniform Delay, d1		1.3			1.5						51.0	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.1			1.5						2.1	
Delay (s)		2.5			3.0						53.1	
Level of Service		A			A						D	
Approach Delay (s)		2.5			3.0			0.0			53.1	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	177	27	18	85	10	12
Future Vol, veh/h	177	27	18	85	10	12
Conflicting Peds, #/hr	0	18	18	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	84	75	89	63	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	227	32	24	96	16	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	277	0	405	262
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	144	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1298	-	606	782
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	888	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1297	-	585	769
Mov Cap-2 Maneuver	-	-	-	-	585	-
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	870	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	665	-	-	1297	-
HCM Lane V/C Ratio	0.048	-	-	0.019	-
HCM Control Delay (s)	10.7	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	182	14	12	91	13	21
Future Vol, veh/h	182	14	12	91	13	21
Conflicting Peds, #/hr	0	15	15	0	3	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	70	100	84	65	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	256	20	12	108	20	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	291	0	416	281
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	135	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1282	-	597	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1282	-	582	753
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	885	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	671	-	-	1282	-
HCM Lane V/C Ratio	0.072	-	-	0.009	-
HCM Control Delay (s)	10.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	480	605	6	5	21
Future Vol, veh/h	33	480	605	6	5	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	65	87	93	75	42	56
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	51	552	651	8	12	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	659	0	-	0	1308	329
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	653	-
Critical Hdwy	4.1	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	939	-	-	-	165	673
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	939	-	-	-	152	673
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	481	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	939	-	-	-	369
HCM Lane V/C Ratio	0.054	-	-	-	0.134
HCM Control Delay (s)	9.1	0	-	-	16.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	514	666	339
v/c Ratio	0.46	0.30	0.69
Control Delay	6.9	4.8	46.5
Queue Delay	0.0	0.0	0.0
Total Delay	6.9	4.8	46.5
Queue Length 50th (ft)	104	59	106
Queue Length 95th (ft)	199	100	74
Internal Link Dist (ft)	529	261	388
Turn Bay Length (ft)			
Base Capacity (vph)	1116	2238	689
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.46	0.30	0.49

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↑		↰↑↑	
Traffic Volume (vph)	0	488	626	0	153	14
Future Volume (vph)	0	488	626	0	153	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	0.95		0.97	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		1488	2984		2872	
Flt Permitted		1.00	1.00		0.96	
Satd. Flow (perm)		1488	2984		2872	
Peak-hour factor, PHF	0.81	0.95	0.94	0.58	0.50	0.43
Adj. Flow (vph)	0	514	666	0	306	33
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	514	666	0	339	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Parking (#/hr)	0	0	0	0	0	0
Turn Type		NA	NA		Prot	
Protected Phases		1	1		5	
Permitted Phases						
Actuated Green, G (s)		75.0	75.0		17.0	
Effective Green, g (s)		75.0	75.0		17.0	
Actuated g/C Ratio		0.75	0.75		0.17	
Clearance Time (s)		4.0	4.0		4.0	
Vehicle Extension (s)		2.0	2.0		3.0	
Lane Grp Cap (vph)		1116	2238		488	
v/s Ratio Prot		c0.35	0.22		c0.12	
v/s Ratio Perm						
v/c Ratio		0.46	0.30		0.69	
Uniform Delay, d1		4.8	4.0		39.1	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		1.4	0.3		4.3	
Delay (s)		6.1	4.4		43.3	
Level of Service		A	A		D	
Approach Delay (s)		6.1	4.4		43.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	135	7	5	295	9	26
Future Vol, veh/h	135	7	5	295	9	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	38	56	79	69	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	169	18	9	373	13	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	187	0	569	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	391	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1399	-	487	870
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1399	-	483	870
Mov Cap-2 Maneuver	-	-	-	-	483	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	714	-	-	1399	-
HCM Lane V/C Ratio	0.067	-	-	0.006	-
HCM Control Delay (s)	10.4	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	1	0	164	2	297	4	0	0	0	0	13	2
Future Vol, veh/h	1	0	164	2	297	4	0	0	0	0	13	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	75	75	38	70	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	0	219	5	424	4	0	0	0	0	14	2

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	429	0	0	219	0	0	549	658	426
Stage 1	-	-	-	-	-	-	437	437	-
Stage 2	-	-	-	-	-	-	112	221	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1141	-	-	1362	-	-	500	387	633
Stage 1	-	-	-	-	-	-	655	583	-
Stage 2	-	-	-	-	-	-	918	724	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1141	-	-	1362	-	-	497	0	633
Mov Cap-2 Maneuver	-	-	-	-	-	-	497	0	-
Stage 1	-	-	-	-	-	-	652	0	-
Stage 2	-	-	-	-	-	-	917	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1141	-	-	1362	-	-	633
HCM Lane V/C Ratio	0.001	-	-	0.004	-	-	0.026
HCM Control Delay (s)	8.2	0	-	7.7	0	-	10.8
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	619	713	27	1	29
Future Vol, veh/h	50	619	713	27	1	29
Conflicting Peds, #/hr	49	0	0	49	52	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	91	93	58	25	88
Heavy Vehicles, %	0	4	2	0	0	0
Mvmt Flow	79	680	767	47	4	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	862	0	-	0	1730	463
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	891	-
Critical Hdwy	4.1	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	789	-	-	-	89	551
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	404	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	784	-	-	-	68	524
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	324	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	784	-	-	-	304
HCM Lane V/C Ratio	0.101	-	-	-	0.122
HCM Control Delay (s)	10.1	0	-	-	18.5
HCM Lane LOS	B	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	0.4

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	720	755	1000
v/c Ratio	0.89	0.46	0.96
Control Delay	37.3	15.5	53.4
Queue Delay	0.0	0.0	0.0
Total Delay	37.3	15.5	53.4
Queue Length 50th (ft)	433	160	345
Queue Length 95th (ft)	#706	208	189
Internal Link Dist (ft)	529	426	378
Turn Bay Length (ft)			
Base Capacity (vph)	806	1649	1074
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.89	0.46	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↑		↰↑↑	
Traffic Volume (vph)	0	684	717	0	478	35
Future Volume (vph)	0	684	717	0	478	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	0.95		0.97	
Frpb, ped/bikes		1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00		1.00	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1430	2925		2885	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		1430	2925		2885	
Peak-hour factor, PHF	0.46	0.95	0.95	0.69	0.50	0.80
Adj. Flow (vph)	0	720	755	0	956	44
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	720	755	0	1000	0
Confl. Peds. (#/hr)	47			47	24	4
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	4%	2%	0%	0%	0%
Parking (#/hr)	0	0	0	0	0	0
Turn Type		NA	NA		Prot	
Protected Phases		1	1		5	
Permitted Phases						
Actuated Green, G (s)		62.0	62.0		40.0	
Effective Green, g (s)		62.0	62.0		40.0	
Actuated g/C Ratio		0.56	0.56		0.36	
Clearance Time (s)		4.0	4.0		4.0	
Vehicle Extension (s)		0.2	0.2		2.0	
Lane Grp Cap (vph)		806	1648		1049	
v/s Ratio Prot		c0.50	0.26		c0.35	
v/s Ratio Perm						
v/c Ratio		0.89	0.46		0.95	
Uniform Delay, d1		21.1	14.1		34.1	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		14.4	0.9		17.4	
Delay (s)		35.5	15.0		51.5	
Level of Service		D	B		D	
Approach Delay (s)		35.5	15.0		51.5	
Approach LOS		D	B		D	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	393	28	19	160	24	58
Future Vol, veh/h	393	28	19	160	24	58
Conflicting Peds, #/hr	0	18	18	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	84	75	89	63	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	504	33	25	180	38	77

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	555	0	769	540
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	230	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1026	-	372	546
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	813	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1025	-	356	537
Mov Cap-2 Maneuver	-	-	-	-	356	-
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	791	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	460	-	-	1025	-
HCM Lane V/C Ratio	0.251	-	-	0.025	-
HCM Control Delay (s)	15.4	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↱	
Traffic Vol, veh/h	3	0	410	13	165	14	0	0	0	0	10	2
Future Vol, veh/h	3	0	410	13	165	14	0	0	0	0	10	2
Conflicting Peds, #/hr	0	0	15	15	0	0	3	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	71	70	100	84	92	65	92	75	92	92	92
Heavy Vehicles, %	2	0	0	0	0	2	0	2	0	2	2	2
Mvmt Flow	3	0	586	13	196	15	0	0	0	0	11	2

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	212	0	0	601	0	0	-	837	204
Stage 1	-	-	-	-	-	-	-	230	-
Stage 2	-	-	-	-	-	-	-	607	-
Critical Hdwy	4.12	-	-	4.1	-	-	-	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.52	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	-	4.018	3.318
Pot Cap-1 Maneuver	1358	-	-	986	-	-	0	303	837
Stage 1	-	-	-	-	-	-	0	714	-
Stage 2	-	-	-	-	-	-	0	486	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1358	-	-	986	-	-	-	0	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.5	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1358	-	-	986	-	-	837
HCM Lane V/C Ratio	0.002	-	-	0.013	-	-	0.016
HCM Control Delay (s)	7.7	0	-	8.7	0	-	9.4
HCM Lane LOS	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	480	605	11	10	26
Future Vol, veh/h	34	480	605	11	10	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	65	87	93	75	42	56
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	552	651	15	24	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	665	0	-	0	1314	333
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	656	-
Critical Hdwy	4.1	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	934	-	-	-	164	669
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	520	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	934	-	-	-	151	669
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	934	-	-	-	309
HCM Lane V/C Ratio	0.056	-	-	-	0.227
HCM Control Delay (s)	9.1	0	-	-	20
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	533	671	401
v/c Ratio	0.49	0.31	0.73
Control Delay	8.3	5.6	45.7
Queue Delay	0.0	0.0	0.0
Total Delay	8.3	5.6	45.7
Queue Length 50th (ft)	122	66	124
Queue Length 95th (ft)	232	111	83
Internal Link Dist (ft)	529	261	388
Turn Bay Length (ft)			
Base Capacity (vph)	1084	2174	776
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.49	0.31	0.52

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↑		↰↑↑	
Traffic Volume (vph)	0	506	631	0	184	14
Future Volume (vph)	0	506	631	0	184	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	0.95		0.97	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		1488	2984		2877	
Flt Permitted		1.00	1.00		0.96	
Satd. Flow (perm)		1488	2984		2877	
Peak-hour factor, PHF	0.81	0.95	0.94	0.58	0.50	0.43
Adj. Flow (vph)	0	533	671	0	368	33
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	533	671	0	401	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Parking (#/hr)	0	0	0	0	0	0
Turn Type		NA	NA		Prot	
Protected Phases		1	1		5	
Permitted Phases						
Actuated Green, G (s)		72.9	72.9		19.1	
Effective Green, g (s)		72.9	72.9		19.1	
Actuated g/C Ratio		0.73	0.73		0.19	
Clearance Time (s)		4.0	4.0		4.0	
Vehicle Extension (s)		2.0	2.0		3.0	
Lane Grp Cap (vph)		1084	2175		549	
v/s Ratio Prot		c0.36	0.22		c0.14	
v/s Ratio Perm						
v/c Ratio		0.49	0.31		0.73	
Uniform Delay, d1		5.7	4.7		38.0	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		1.6	0.4		5.0	
Delay (s)		7.3	5.1		43.0	
Level of Service		A	A		D	
Approach Delay (s)		7.3	5.1		43.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	135	8	10	295	14	57
Future Vol, veh/h	135	8	10	295	14	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	38	56	79	69	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	169	21	18	373	20	76

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	190	0	588	179
Stage 1	-	-	-	-	179	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1396	-	475	869
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	675	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1396	-	467	869
Mov Cap-2 Maneuver	-	-	-	-	467	-
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	664	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	736	-	-	1396	-
HCM Lane V/C Ratio	0.131	-	-	0.013	-
HCM Control Delay (s)	10.6	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	1	0	195	2	302	4	0	0	0	0	13	2
Future Vol, veh/h	1	0	195	2	302	4	0	0	0	0	13	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	75	75	38	70	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	0	260	5	431	4	0	0	0	0	14	2

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	436	0	0	260	0	0	576	706	434
Stage 1	-	-	-	-	-	-	444	444	-
Stage 2	-	-	-	-	-	-	132	262	-
Critical Hdwy	4.1	-	-	4.1	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1134	-	-	1316	-	-	482	363	626
Stage 1	-	-	-	-	-	-	651	579	-
Stage 2	-	-	-	-	-	-	899	695	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1134	-	-	1316	-	-	479	0	626
Mov Cap-2 Maneuver	-	-	-	-	-	-	479	0	-
Stage 1	-	-	-	-	-	-	648	0	-
Stage 2	-	-	-	-	-	-	898	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1134	-	-	1316	-	-	626
HCM Lane V/C Ratio	0.001	-	-	0.004	-	-	0.026
HCM Control Delay (s)	8.2	0	-	7.7	0	-	10.9
HCM Lane LOS	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	619	713	46	2	31
Future Vol, veh/h	55	619	713	46	2	31
Conflicting Peds, #/hr	49	0	0	49	52	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	91	93	58	25	88
Heavy Vehicles, %	0	4	2	0	0	0
Mvmt Flow	87	680	767	79	8	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	895	0	-	0	1762	479
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	907	-
Critical Hdwy	4.1	-	-	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	767	-	-	-	85	538
Stage 1	-	-	-	-	382	-
Stage 2	-	-	-	-	397	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	762	-	-	-	64	512
Mov Cap-2 Maneuver	-	-	-	-	64	-
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	310	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	25
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	762	-	-	-	223
HCM Lane V/C Ratio	0.115	-	-	-	0.194
HCM Control Delay (s)	10.3	0	-	-	25
HCM Lane LOS	B	A	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	-	0.7

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	732	775	1042
v/c Ratio	0.93	0.48	0.96
Control Delay	43.5	16.5	52.8
Queue Delay	0.0	0.0	0.0
Total Delay	43.5	16.5	52.8
Queue Length 50th (ft)	459	170	362
Queue Length 95th (ft)	#734	220	194
Internal Link Dist (ft)	529	426	378
Turn Bay Length (ft)			
Base Capacity (vph)	786	1608	1101
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.93	0.48	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↑		↰↑↑	
Traffic Volume (vph)	0	695	736	0	499	35
Future Volume (vph)	0	695	736	0	499	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	0.95		0.97	
Frpb, ped/bikes		1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00		1.00	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		1430	2925		2886	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		1430	2925		2886	
Peak-hour factor, PHF	0.46	0.95	0.95	0.69	0.50	0.80
Adj. Flow (vph)	0	732	775	0	998	44
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	732	775	0	1042	0
Confl. Peds. (#/hr)	47			47	24	4
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	4%	2%	0%	0%	0%
Parking (#/hr)	0	0	0	0	0	0
Turn Type		NA	NA		Prot	
Protected Phases		1	1		5	
Permitted Phases						
Actuated Green, G (s)		60.5	60.5		41.5	
Effective Green, g (s)		60.5	60.5		41.5	
Actuated g/C Ratio		0.55	0.55		0.38	
Clearance Time (s)		4.0	4.0		4.0	
Vehicle Extension (s)		2.0	2.0		3.0	
Lane Grp Cap (vph)		786	1608		1088	
v/s Ratio Prot		c0.51	0.26		c0.36	
v/s Ratio Perm						
v/c Ratio		0.93	0.48		0.96	
Uniform Delay, d1		22.8	15.2		33.4	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		19.2	1.0		17.8	
Delay (s)		42.0	16.2		51.2	
Level of Service		D	B		D	
Approach Delay (s)		42.0	16.2		51.2	
Approach LOS		D	B		D	

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	393	33	38	160	27	79
Future Vol, veh/h	393	33	38	160	27	79
Conflicting Peds, #/hr	0	18	18	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	84	75	89	63	75
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	504	39	51	180	43	105

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	561	0	822	542
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	281	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1020	-	346	544
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1019	-	321	535
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	449	-	-	1019	-
HCM Lane V/C Ratio	0.33	-	-	0.05	-
HCM Control Delay (s)	16.9	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↱	
Traffic Vol, veh/h	3	0	431	13	184	14	0	0	0	0	10	2
Future Vol, veh/h	3	0	431	13	184	14	0	0	0	0	10	2
Conflicting Peds, #/hr	0	0	15	15	0	0	3	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	71	70	100	84	92	65	92	75	92	92	92
Heavy Vehicles, %	2	0	0	0	0	2	0	2	0	2	2	2
Mvmt Flow	3	0	616	13	219	15	0	0	0	0	11	2

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	234	0	0	631	0	0	-	890	227
Stage 1	-	-	-	-	-	-	-	253	-
Stage 2	-	-	-	-	-	-	-	637	-
Critical Hdwy	4.12	-	-	4.1	-	-	-	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.52	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	-	4.018	3.318
Pot Cap-1 Maneuver	1333	-	-	961	-	-	0	282	812
Stage 1	-	-	-	-	-	-	0	698	-
Stage 2	-	-	-	-	-	-	0	471	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1333	-	-	961	-	-	-	0	812
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.5	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1333	-	-	961	-	-	812
HCM Lane V/C Ratio	0.002	-	-	0.014	-	-	0.016
HCM Control Delay (s)	7.7	0	-	8.8	0	-	9.5
HCM Lane LOS	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0

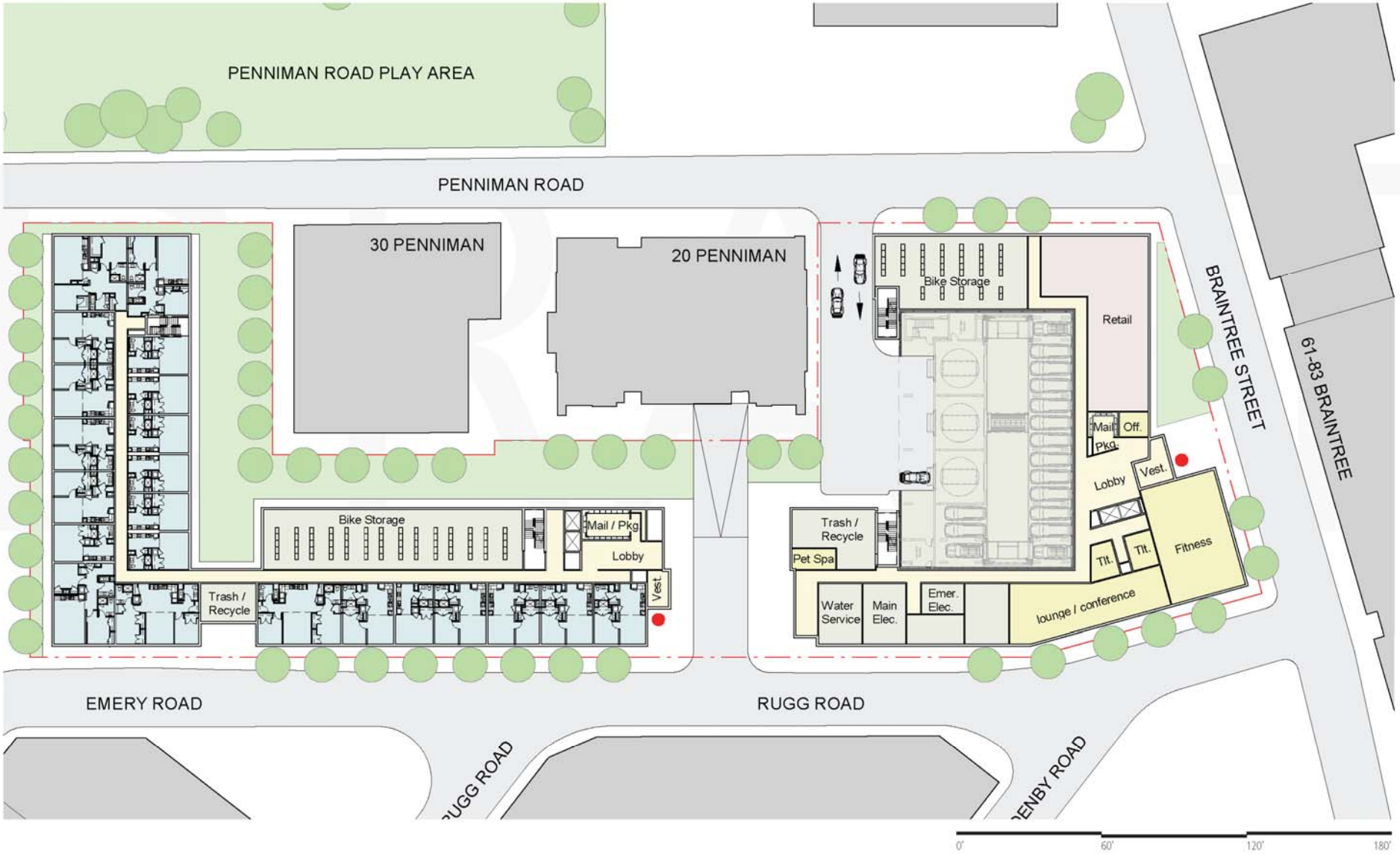
APPENDIX 5

ENVIRONMENTAL PROTECTION

APPENDIX 5-A
WIND

78 BRAINTREE STREET
PROJECT NOTIFICATION FORM

Page Contents



GROUND FLOOR PLAN

N

DiMella Shaffer
40 RUGG RD
ALLSTON, MA

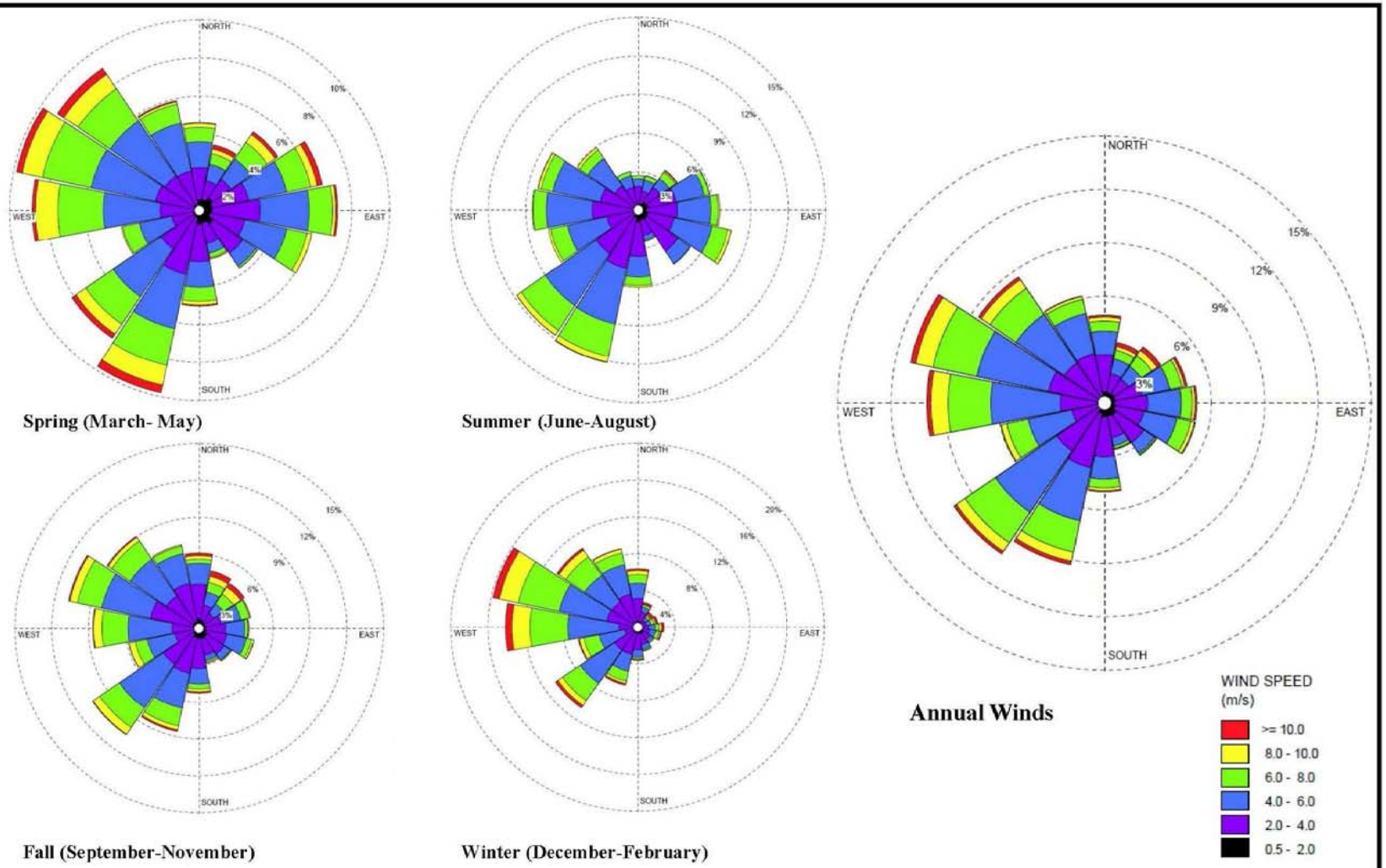


Figure 2.
Directional Distribution (%) of Winds (Blowing From)
Boston Logan International Airport (2012 to 2016)

78 Braintree Street Allston, MA Pedestrian Level Wind Impact Analysis

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Figure 3.

General Wind Flow Patterns

78 Braintree Street Allston, MA Pedestrian Level Wind Impact Analysis

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

APPENDIX 5-B
AIR QUALITY

78 BRAINTREE STREET
PROJECT NOTIFICATION FORM

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN NoUrbTran

                                        ***   MODEL SETUP OPTIONS SUMMARY   ***
- -

**Model Is Setup For Calculation of Average CONCentration Values.

  -- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for   2 Source(s),
  for Total of   1 Urban Area(s):
  Urban Population =   8136.0 ; Urban Roughness Length = 1.000 m
**Non-DFAULT option to ignore morning transition from nighttime urban boundary layer (NoUrbTran) selected.

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Assumes Receptors on FLAT Terrain.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Urban Roughness Length of 1.0 Meter Used.

**Other Options Specified:
        NOCHKD   - Suppresses checking of date sequence in meteorology files
        SCREEN   - Use screening option
which forces calculation of centerline values

**Model Accepts FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: CO

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 2 Source(s);   1 Source Group(s); and   668 Receptor(s)

               with: 0 POINT(s), including
                          0 POINTCAP(s) and   0 POINTHOR(s)
                and: 2 VOLUME source(s)
                and: 0 AREA type source(s)
                and: 0 LINE source(s)
                and: 0 OPENPIT source(s)
                and: 0 BUOYANT LINE source(s) with   0 lines

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 16126

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) =   5.00 ; Decay Coef. =   0.000   ; Rot. Angle =   0.0
                 Emission Units = GRAMS/SEC   ; Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =   3.6 MB of RAM.

**Input Runstream File: CO_5yrs_CO.DTA

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN NoUrbTran

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN NoUrbTran

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: Urban.sfc Met Version: 16126
Profile file: Urban.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 11111 Upper air station no.: 22222
Name: UNKNOWN Name: UNKNOWN
Year: 2010 Year: 2010

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	10.	10.0	255.2	2.0
10	01	02	2	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	20.	10.0	255.2	2.0
10	01	03	3	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	30.	10.0	255.2	2.0
10	01	04	4	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	40.	10.0	255.2	2.0
10	01	05	5	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	50.	10.0	255.2	2.0
10	01	06	6	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	60.	10.0	255.2	2.0
10	01	07	7	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	70.	10.0	255.2	2.0
10	01	08	8	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	80.	10.0	255.2	2.0
10	01	09	9	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	90.	10.0	255.2	2.0
10	01	10	10	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	100.	10.0	255.2	2.0
10	01	11	11	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	110.	10.0	255.2	2.0
10	01	12	12	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	120.	10.0	255.2	2.0
10	01	13	13	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	130.	10.0	255.2	2.0
10	01	14	14	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	140.	10.0	255.2	2.0
10	01	15	15	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	150.	10.0	255.2	2.0
10	01	16	16	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	160.	10.0	255.2	2.0
10	01	17	17	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	170.	10.0	255.2	2.0
10	01	18	18	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	180.	10.0	255.2	2.0
10	01	19	19	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	190.	10.0	255.2	2.0
10	01	20	20	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	200.	10.0	255.2	2.0
10	01	21	21	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	210.	10.0	255.2	2.0
10	01	22	22	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	220.	10.0	255.2	2.0
10	01	23	23	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	230.	10.0	255.2	2.0
10	01	24	24	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	240.	10.0	255.2	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
10	01	01	01	10.0	1	10.	0.50	255.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN NoUrbTran

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	430.83135	ON 10011506: AT (230008.40, 900602.60, 5.00, 5.00, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** AERMOD - VERSION 16216 *** *** 78 Braintree Street *** 05/19/17
*** AERMET - VERSION 16126 *** *** CO 1-hour Screening Modeling *** 13:24:22

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN NoUrbTran

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 3 Warning Message(s)
A Total of 0 Informational Message(s)

A Total of 18504 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 0 Missing Hours Identified (0.00 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

INDOOR GARAGE ANALYSIS PROGRAM

PROJECT: 78 BRAINTREE STREET GARAGE PEAK PM HOUR - YEAR: 2017

DISTANCE IN:	70	METERS
DISTANCE OUT:	70	METERS
NUMBER OF EXIT LANES:	1	LANE(S)
TOTAL EXIT VOLUME:	75	VEH/HOUR
CO RATE:	2.976	GRAMS CO/MILE
SPEED IN GARAGE:	5.0	M.P.H.
VENT CFM:	52,800	CFM

TOTAL CO EMISSIONS = 0.15 GRAMS/MIN = 0.0025 GRAMS/SEC
TOTAL VENTILATION = 1,495 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 0.09 PPM

MOVES2014 OUTPUT

Road Type ID	Link Length (miles)	Link Volume (Vehicles/Hr)	Link Avg Speed (Miles/Hr)	Pollutant	Emission Factor (Grams/veh-mi)
5	0.07	19	5	CO	2.976
5	0.07	32	5	CO	2.976

APPENDIX 5-D
NOISE

78 BRAINTREE STREET
PROJECT NOTIFICATION FORM

Page Contents

FIGURE 1
Sound Monitoring & Modeling Receptor Locations
78 Braintree St
Allston, MA

tech environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Cadna Noise Modeling Results

City of Boston Noise Regulations

	Name	ID	Sound	Octave Band Day								
			Level	31	63	125	250	500	1000	2000	4000	8000
			(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
R1	61-83 Braintree Street	Top_Floor	40.8	45.1	46.1	47.7	43.6	38.9	34.6	27.3	18.3	8.9
R2	90 Braintree Street	Top_Floor	44.7	42.1	43.5	48.6	47.3	42.9	39.0	32.8	24.5	12.5
R3	20 Hano Street	Top_Floor	44	42.3	43.5	48.2	47.2	42.5	37.7	30.7	21.3	6.5
R4	24 Hano Street	Top_Floor	44	41.4	42.8	48.0	47.3	42.5	37.6	30.7	21.4	6.5
R5	28 Hano Street	Top_Floor	43.8	41.4	42.9	48.0	47.1	42.4	37.5	30.5	21.1	6.2
R6	32 Hano Street	Top_Floor	44	41.5	42.9	48.0	47.2	42.5	37.7	30.9	21.2	6.2
R7	34 Hano Street	Top_Floor	43.9	41.6	43.0	48.0	47.0	42.4	37.9	30.9	21.3	6.0
R8	40 Hano Street	Top_Floor	43.7	41.7	43.1	47.9	46.5	42.3	37.8	30.8	21.1	5.7
R9	44 Hano Street	Top_Floor	43.4	41.0	43.2	47.5	46.1	42.2	37.4	30.4	20.7	5.1
R10	48 Hano Street	Top_Floor	43	41.1	42.9	47.1	45.9	41.6	36.8	29.9	20.2	4.5
R11	50 Hano Street	Top_Floor	43.2	41.1	42.4	46.9	45.9	41.9	37.1	30.2	20.4	4.2
R12	56 Hano Street	Top_Floor	43.2	41.1	42.0	46.7	46.3	41.8	37.0	30.1	20.2	3.8
R13	58 Hano Street	Top_Floor	42.5	41.1	41.9	46.3	45.7	41.0	36.2	29.3	19.5	3.1
R14	60 Hano Street	Top_Floor	42.2	41.1	41.8	45.9	45.3	40.7	36.0	29.0	19.1	2.5
R15	66 Hano Street	Top_Floor	42.1	41.2	41.7	45.7	45.2	40.6	35.9	29.0	19.0	1.9
R16	72 Hano Street	Top_Floor	41.7	41.2	41.7	45.5	44.8	40.2	35.6	28.6	18.6	1.3
R17	76 Hano Street	Top_Floor	41.5	41.3	41.6	45.6	44.5	40.0	35.4	28.4	18.1	0.4
R18	83 Hano Street	Top_Floor	39.4	41.2	42.5	43.9	42.0	38.0	33.6	26.4	15.5	0.0
R19	451 Cambridge Street	Top_Floor	39.3	41.0	42.7	44.2	42.8	37.7	32.9	25.2	14.9	-0.2
	Boston Limits		50	68	67	61	52	46	40	33	28	26

MassDEP Noise Policy

	Nighttime					
	Name	ID	Project Level (dBA)	Background Level (dBA)	Total New Level (dBA)	Increase Over Existing (dBA)
R1	61-83 Braintree Street	Top_Floor	40.8	55.2	55.4	0.2
R2	90 Braintree Street	Top_Floor	44.7	55.2	55.6	0.4
R3	20 Hano Street	Top_Floor	44	44.6	47.3	2.7
R4	24 Hano Street	Top_Floor	44	44.6	47.3	2.7
R5	28 Hano Street	Top_Floor	43.8	44.6	47.2	2.6
R6	32 Hano Street	Top_Floor	44	44.6	47.3	2.7
R7	34 Hano Street	Top_Floor	43.9	44.6	47.3	2.7
R8	40 Hano Street	Top_Floor	43.7	44.6	47.2	2.6
R9	44 Hano Street	Top_Floor	43.4	44.6	47.1	2.5
R10	48 Hano Street	Top_Floor	43	44.6	46.9	2.3
R11	50 Hano Street	Top_Floor	43.2	44.6	47.0	2.4
R12	56 Hano Street	Top_Floor	43.2	44.6	47.0	2.4
R13	58 Hano Street	Top_Floor	42.5	44.6	46.7	2.1
R14	60 Hano Street	Top_Floor	42.2	44.6	46.6	2.0
R15	66 Hano Street	Top_Floor	42.1	44.6	46.5	1.9
R16	72 Hano Street	Top_Floor	41.7	44.6	46.4	1.8
R17	76 Hano Street	Top_Floor	41.5	44.6	46.3	1.7
R18	83 Hano Street	Top_Floor	39.4	47.3	48.0	0.7
R19	451 Cambridge Street	Top_Floor	39.3	47.3	47.9	0.6

APPENDIX 6

LEED SCORECARD

LEED BD+C: Multifamily Midrise v4 - LEED v4

Scorecard

Note: The information on this tab is READ-ONLY. To edit this information, see the Credit Category tabs.

Integrative Process		**Preliminary**	Y	1 of 2	M	*0*	**Verified**	0
IPc	**Integrative Process**			1 of 2		*0*		
Location and Transportation		**Preliminary**	Y	14 of 15	M	*1*	**Verified**	0
LTp	Floodplain Avoidance			Required				Verified
Performance Path								
LTc	LEED for Neighborhood Development			0 of 15		*0*		
Prescriptive Path								
LTc	Site Selection			8 of 8		*0*		
LTc	Compact Development			3 of 3		*0*		
LTc	Community Resources			2 of 2		*0*		
LTc	Access to Transit			1 of 2		*1*		
Sustainable Sites		**Preliminary**	Y	4 of 7	M	*0*	**Verified**	0
SSp	Construction Activity Pollution Prevention			Required				Not Verified
SSp	No Invasive Plants			Required				Not Verified
SSc	Heat Island Reduction			0 of 2		*0*		
SSc	Rainwater Management			2 of 3		*0*		
SSc	Nontoxic Pest Control			2 of 2		*0*		
Water Efficiency		**Preliminary**	Y	6 of 12	M	*2*	**Verified**	0
WEp	Water Metering			Required				Not Verified
Performance Path								
WEc	Total Water Use			0 of 12		*0*		
Prescriptive Path								
WEc	Indoor Water Use			6 of 6		*0*		
WEc	Outdoor Water Use			0 of 4		*2*		
Energy and Atmosphere		**Preliminary**	Y	24.5 of 37	M	*0*	**Verified**	0
EAp	Minimum Energy Performance			Required				Not Verified
EAp	Energy Metering			Required				Not Verified
EAp	Education of the Homeowner, Tenant or Building Manager			Required				Not Verified
EAc	Annual Energy Use			21.5 of 30		*0*		
EAc	Efficient Hot Water Distribution System			2 of 5		*0*		
EAc	Advanced Utility Tracking			1 of 2		*0*		
Materials and Resources		**Preliminary**	Y	3.5 of 9	M	*3*	**Verified**	0
MRp	Certified Tropical Wood			Required				Not Verified
MRp	Durability Management			Required				Not Verified
MRc	Durability Management Verification			1 of 1		*0*		
MRc	Environmentally Preferable Products			1.5 of 5		*2*		
MRc	Construction Waste Management			1 of 3		*1*		
Indoor Environmental Quality		**Preliminary**	Y	10 of 18	M	*4*	**Verified**	0
EQp	Ventilation			Required				Not Verified
EQp	Combustion Venting			Required				Not Verified
EQp	Garage Pollutant Protection			Required				Not Verified
EQp	Radon-Resistant Construction			Required				Not Verified
EQp	Air Filtering			Required				Not Verified
EQp	Environmental Tobacco Smoke			Required				Not Verified
EQp	Compartmentalization			Required				Not Verified
EQc	Enhanced Ventilation			3 of 3		*0*		
EQc	Contaminant Control			1 of 2		*1*		
EQc	Balancing of Heating and Cooling Distribution Systems			1 of 3		*2*		
EQc	Enhanced Compartmentalization			0 of 3		*0*		
EQc	Combustion Venting			2 of 2		*0*		
EQc	Enhanced Garage Pollutant Protection			1 of 1		*0*		
EQc	Low-Emitting Products			1 of 3		*1*		
EQc	No Environmental Tobacco Smoke			1 of 1		*0*		
Innovation		**Preliminary**	Y	0 of 6	M	*0*	**Verified**	0
INp	Preliminary Rating			Required				Not Verified
INc	Innovation			0 of 5		*0*		
INc	LEED Accredited Professional			0 of 1		*0*		

Regional Priority	Preliminary	Y 0 of 4	M 0	Verified	0
RPc Regional Priority		0 of 4	0		

Point Floors	
The project earned at least 8 points total in Location and Transportation and Energy and Atmosphere	No
The project earned at least 3 points in Water Efficiency	No
The project earned at least 3 points in Indoor Environmental Quality	No

Total	Preliminary	Y 63 of 110	M 10	Verified	0

Certification Thresholds Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110